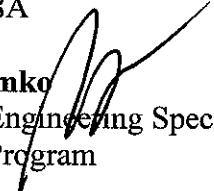




TO 63-958
PA-63-00958A

FROM Devin P. Tomko 
Air Quality Engineering Specialist
Air Quality Program

THROUGH Mark R. Gorog, P.E.  Mark A. Wayner, P.E. 
Environmental Engineer Manager Air Quality Program Manager
Air Quality Program Air Quality Program

DATE August 8, 2012

RE Comment and Response Document for Proposed Plan Approval PA-63-00958A
MarkWest Liberty Midstream and Resources, LLC
Welling Compressor Station
Buffalo Township, Washington County
AUTH: 911754; APS: 770917; PFID: 732829

On January 25, 2012, a plan approval application was received from MarkWest Liberty Midstream and Resources, LLC ("MarkWest") for its Welling Compressor Station ("Welling"), an existing natural gas production facility located in Buffalo Township, Washington County, for installation and operation of the following additional sources:

- Five (5) Waukesha P9390GSI 1,980-bhp rich-burn natural gas-fired compressor engines, each equipped with an automatic air/fuel ratio controller and a Johnson Matthey non-selective catalytic reduction unit (NSCR, or three-way catalyst).
- One (1) John Deere 6068HF285 197-bhp diesel engine (equipped with a Miratech IQ-12-05-L1 oxidation catalyst) for emergency power generation.

The following proposed modifications to previously installed equipment will also be conducted under this Plan Approval:

- Increase of natural gas throughput of the previously installed 100 MMscfd NATCO triethylene glycol ("TEG") dehydrator to 130 MMscfd and uprate of the associated glycol reboiler from 2.0 MMBtu/hr to 2.5 MMBtu/hr. The reboiler will be fitted with one (1) 48" Superior Fabrication flare rated at 1500 scfm and 2.1 MMBtu/hr.

On February 14, 2012, the Department determined that this application was administratively complete. On May 1, 2012, MarkWest was notified of technical deficiencies in the subject application. Complete responses and additional information were received from MarkWest on May 3, 2012.

In accordance with 25 Pa. Code §127.44, notice of intent to issue plan approval PA-63-00958A was published in the *Pennsylvania Bulletin* on May 26, 2012. The required 30-day public comment period ended at the close of business on June 25, 2012.

Each of the comments received during the comment period has been reviewed and either a summary or excerpt of each comment and the Department's response has been included herein. Following all comments and responses is a list of all Department initiated revisions or additions to the conditions of the plan approval. These changes do not impact the BAT determination or emission limitations made for each of the air contamination sources at this facility. Additionally, commenters must recognize that this is an Air Quality Plan Approval proposed under the authority of the Pennsylvania Air Pollution Control Act and the Federal Clean Air Act and that review of the application is limited to those subject areas under which the Department has authority. Responses to comments relating to subject areas outside of this authority have not been provided.

Comments and Responses

- A summary of Joint comments and supporting attachments from Clean Air Council and Group Against Smog and Pollution ("GASP") are as follows with responses supplied after each.

1. Comment:

"The Department has conducted an inadequate analysis for single source determination of the multiple emission sources commonly owned or controlled by MarkWest. As the US Environmental Protection Agency (EPA) has made clear on numerous occasions, federal Clean Air Act regulations and subsequent court decisions require states to consider an array of factors in deciding whether to aggregate emissions from multiple sources. Yet the Department has ignored federal regulations by considering only a subset of factors in their single source determination. When MarkWest's emissions are properly aggregated and counted as a single source, their natural gas facility easily exceeds state and federal air emission limits for several pollutants. The Department should have aggregated emissions from MarkWest's total facility, rather than issue a minor source permit for the Welling Compressor Station (Welling)."

Response:

The Department's aggregation decision for this authorization was made in accordance with the Department's *Guidance for Performing Single Stationary Source Determinations for Oil and Gas Industries* (effective October 12, 2011) as discussed in its June 3, 2012 review memo.

2. Comment :

"The applicant improperly combines lower heating value (LHV) fuel consumption rates with higher heating value (HHV) emission factors, resulting in underestimation of potential to emit (PTE) from natural gas-fired engine combustion."

Response:

All affected calculations have been revised and are now based on the higher heating value (HHV) of the fuel.

3. Comment:

“The CO2 calculation for the Caterpillar G3516B engines should be based on the vendor-supplied CO2 emission rate.”

“Equipment-specific vendor emissions data is typically more accurate than general source- category-wide emission factors such as Part 98 or AP-42. EPA recommends using such equipment-specific data rather than general emission factors when it is available. The Caterpillar spec[ification] sheet for the G3516B engine includes a g/bhp-hr emission rate for CO2. This CO2 emission rate should be used to calculate CO2 emissions for these engines.”

Response:

The emission-related data presented in Caterpillar technical data sheets include footnotes that indicate variations from $\pm 3\%$ to $\pm 6\%$ in fuel consumption, power output, instrumentation, measurements, and engine-to-engine variations. Based on assumptions in 40 CFR Part 98 CO2 emission calculation methods and formulae, which assume that 100% of the carbon in the fuel is converted to CO2, the maximum CO2 emission rate of a combustion source is directly proportional to the amount and type of a given fuel combusted. Since Caterpillar has already accounted for variations in fuel consumption, using the Caterpillar emission rate for CO2 would only serve to over- or underestimate CO2 emissions.

4. Comment:

“The applicant’s PTE calculations for the dehydrator reboiler burner have not been adjusted to account for the increased reboiler rating.”

Response:

PTE for the dehydrator reboiler burner was revised to reflect a heat input rating of 2.5 MMBtu/hr.

5. Comment:

“The applicant’s CO2e PTE calculation for the dehydrator flare uses a fuel consumption figure of 5.97 MMBtu/hr. The source of this figure is unclear and it is inconsistent with the 7 MMBtu/hr figure used to calculate the flare’s PTE for criteria pollutants.”

Response:

The CO2e PTE was recalculated using a “fuel consumption figure” of 7.0 MMBtu/hr, which accounts for the 2.1 MMBtu/hr flare burner and the approximate heat input of 4.9 MMBtu/hr associated with the glycol regenerator overheads stream.

6. Comment:

“The applicant’s PTE calculations fail to account for all emission units and pollutant-emitting activities at the facility [, including] emissions due to truck loadout of condensate [and] CO2 emissions from the engine catalysts.”

Response:

The vapor recovery unit (VRU) is designed to capture 100% of storage tank emissions and acts as a vapor balance system during storage tank loadout. Storage tanks are bottom discharge and tanker truck balance vapors are returned to the storage tanks and processed by the VRU during condensate loadout. As such, emissions from storage tank loadout are negligible.

Emissions of CO₂ from oxidation of CO in engine oxidation catalysts is not tabulated separately since 40 CFR Part 98 emission factors assume 100% conversion of fuel carbon to CO₂. Adding CO₂ emissions associated with oxidation of CO in the catalyst would be double-counting this portion of the exhaust stream.

7. Comment:

“The modified facility PTE likely exceeds the Title V emissions threshold.”

Response:

Upon review of all public comments received with the subject application and comparison of this application with that for another MarkWest facility with similar configuration, the Department reevaluated the emissions potential for CO₂e at Welling and determined that as proposed, the CO₂e emission potential Welling would be 100,071 TPY CO₂e. On July 16, 2012, the Department conveyed this information to MarkWest. In response, MarkWest indicated that one of the proposed Waukesha P9390GSI engines would be removed from its proposal to ensure that Welling remained a minor source.

8. Comment:

“The Department must evaluate whether the pattern of construction at Welling constitutes NSR circumvention.”

Response:

Although MarkWest has submitted multiple applications and has received authorizations for the construction of new sources and the modification of existing sources at Welling, neither the previous authorizations nor the currently proposed project will cause the facility to be subject to the requirements of *major source* preconstruction or Title V permitting. The PTE for the Welling will remain below all major source thresholds.

- Commenters 2-18 and 33 each provided the following information related to the proposed plan approval:

9. Comment:

“I am a concerned resident and have major concerns about the potential environmental and health impacts of the proposed expansion of the Welling Compressor Station located in Buffalo Township, Washington County.

As planned, this facility would emit 49.2 tons per year of Volatile Organic Compounds (VOCs) when the limit to trigger more stringent control requirements is 50 TPY; 58.7 TPY of Nitrous Oxides when the limit is 100 TPY; and 89,422 TPY of CO₂e, when the threshold is 100,000.

The projected level of pollutants for VOCs is particularly alarming. It is shameful that the company would apply for a minor source permit by just barely keeping below federal standards. I insist that PA DEP check the company's math to ensure compliance with all air regulations. VOCs and nitrogen oxides from natural gas operations mix to produce ground-level ozone, which is linked to a variety of respiratory problems including asthma.

Consider the difference between permitting 10 compressor stations that emit 49.9 TPY of VOCs with a minor source permit and issuing Title V permits for 10 stations (or less if aggregated) that emit 50.1 tons per year of VOCs. These decimal point differences would call for much more stringent technologies, monitoring and record-keeping than is currently required. How is PA DEP certain that this facility should not in fact be regulated as a major source of air pollution?

I also understand that this region is currently struggling to meet Federal health standards for Ozone. How has PA DEP ensured that approving this permit for additional sources of air pollution will not deteriorate regional air quality and jeopardize compliance with these federal limits?

I am glad to see that MarkWest will be using a few technologies that appear to reduce harmful air pollution, but I urge PA DEP to go a step further and require even more efficient equipment, including Best Available Control Technologies and Best Management Practices that would bring emissions closer to zero. Please consider requiring the use of the commercially available green completion technologies for this station's proposed flare. Please see the recommended technologies and practices on the EPA's website for some specific ideas about the types of BATs that exist for compressor stations:

<http://www.epa.gov/gasstar/tools/recommended.html>

I request that PA DEP host a public meeting and hearing for this permit application. MarkWest has a lot of compressor stations in this region, and I'm concerned about the cumulative health and air quality impacts. I think a meeting and hearing would provide more opportunity for the public to comment and ask questions. A public hearing is probably PA DEP's most efficient way to respond to public comments as people can have their concerns answered directly. I am very interested to hear the responses to my comments, and in the opportunity to have a discussion about these issues. Thank you for the opportunity to comment, and please keep me updated on any decisions related to Plan Approval No. 63-00958A."

Response:

The Clean Air Act required EPA to set National Ambient Air Quality Standards ("NAAQS") for pollutants considered harmful to public health and the environment and established two levels of national air quality standards: *primary standards* set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly; and *secondary standards* set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Welling is classified as a minor facility and as such is not required to perform modeling to demonstrate that the emissions from this facility will not cause or contribute to a violation of any NAAQS.

According to 40 CFR §81.339, Buffalo Township, Washington County is classified as an area of attainment for all NAAQS, except for 8-hour ozone and PM_{2.5}. Since the Commonwealth of Pennsylvania is located in the Northeast Ozone Transport Region—an ozone transport region established under section 184 of the Clean Air Act (42 U.S.C.A. §7511c)—the entire Commonwealth is

treated as *non-attainment* for ozone. As such, for the purposes of a Non-Attainment (NA) NSR, facilities located within the Commonwealth of Pennsylvania that have *the potential to emit* (PTE) 50 tpy or more of VOCs, 100 tpy or more of NOx (oxides of nitrogen), or 100 tpy of PM2.5, are considered major.

"Potential to emit" (or PTE) is defined in 25 Pa. Code §121.1 as:

"The maximum capacity of a source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and limitations on hours of operation or on the type or amount of material combusted, stored or processed shall be treated as part of the design if the limitation or the effect it would have on emissions is Federally enforceable or legally and practicably enforceable by an operating permit condition. The term does not include secondary emission from an offsite facility."

Using this definition, the Department has incorporated short-term emissions limitations (on a *grams-per-horsepower-per hour* and a *pounds-per-hour* basis) into the conditions of proposed Plan Approval PA-63-00958A for the proposed sources and controls. These limitations were drawn from manufacturer specifications, guaranteed emission rates, and applicable emission factors.

Since a minor source *construction permit* (or minor source *Plan Approval* as referred to in the Pennsylvania Code) issued pursuant to a state program approved by EPA as meeting the requirements of 40 CFR §51.160 is federally enforceable—where, *federally enforceable* is defined as "*all limitations and conditions which are enforceable by the Administrator [EPA], including those requirements...within any applicable State implementation plan, any permit requirements established pursuant to 40 CFR 52.21 or under regulations approved pursuant to 40 CFR part 51...including operating permits issued under an EPA-approved program that is incorporated into the State implementation plan and expressly requires adherence to any permit issued under such program*"—the emission limitations contained in proposed Plan Approval PA-63-00958A have been used to limit the subject facility's PTE to a level below the major source thresholds for all NSR-regulated pollutants, thus establishing that Welling is a minor source.

With respect to EPA's Natural Gas STAR Program, this program is a flexible, voluntary partnership that encourages oil and natural gas companies to adopt proven, cost-effective technologies and practices that improve operational efficiency and reduce methane emissions. According to MarkWest, the following efficiency and emission reduction technologies and work practices are incorporated at its facilities:

Compressors:

- Compressor engines are equipped with air-powered starters.
- Compressor rod packing systems are replaced approximately every two (2) years to maintain proper operation and minimize emissions.
- Blowdown gas is routed, to the extent practicable, to low pressure mains instead of being vented to atmosphere.

Dehydrators:

- Glycol dehydrator emissions are routed to flare due to water and oxygen content.
- Glycol dehydration units are equipped with flash tank separators.
- All pumps are electric-motor driven.

Directed Inspection and Maintenance:

- Sites are visited and inspected on a daily basis.

Pneumatics/Controls:

- All pneumatic controls are instrument air-operated.

Tanks:

- During condensate loading a vapor return line is connected between the tanker and the tanks to recover tank vapors.
- Vapor Recovery Units are installed on all atmospheric storage tanks.

With respect to requests for a public hearing regarding the proposed plan approval for Welling, the Department does not believe that a public hearing is warranted since, based on the comments received, the Department has made changes where appropriate and provided additional explanation of its decisions in this document.

- Commenter 18, in addition to supporting documentation and data, provided the following information related to the proposed plan approval:

10. Comment:

“It is our opinion that given:

The location of the proposed compressor station in an environmental nonattainment status for ozone;

The compressor station will potentially emit NOx equivalent to 3073 cars added to the roads each year;

NOx is a precursor to ozone; [and]

The proposed compressors will add to existing compressor stations which together will potentially emit thirty times the NOx pollution of the existing Edgar Thompson Works of USS[.]

No natural gas compressor station should be permitted in Washington County or in Pennsylvania without an evaluation of the impact of the proposed pollution levels contributed by that compressor station on the overall pollution levels in the County and State to ensure that such stations will not further contribute to non-attainment of acceptable pollution levels.”

Response:

As noted in the Department’s responses to Comment #9, Welling is classified as a natural minor facility and as such is not required to perform modeling to demonstrate that the emissions from this facility will not cause or contribute to a violation of any NAAQS. As a natural minor facility, emissions are not expected to exceed the NAAQS or significant impact limits for the NAAQS.

Modeling to determine attainment status for the ozone NAAQS is normally done on a regional scale that may include multiple states and hundreds of air contamination sources. This modeling is performed using a more complex photochemical model (compared to dispersion modeling) that accounts for atmospheric processes and reactions for the formation of ozone and may utilize up to a year of meteorological data across the modeled region. According to the Department’s Air Quality Modeling

Section, the Department is currently not equipped to perform photochemical modeling on its own. It is performed by other States in coordination with the Ozone Transport Commission for regions including Pennsylvania. Additionally, NO_x and VOC are accounted for in this type of modeling as both contribute to the formation of ozone. Welling will remain a minor source with respect to NO_x and VOC upon issuance of this Plan Approval, and according to the Department's Air Quality Modeling Section, a single [minor] source is not expected to impact a regional model. Such modeling is considered to be outside of the scope of this Plan Approval application review.

On November 1, 2010, the Department released findings obtained during a short-term five-week monitoring program conducted near several natural gas facilities in the Washington and Greene County areas of Pennsylvania. Due to the limited scope and duration of the sampling and the limited number of sources and facilities sampled, the findings only represent conditions at the time of the sampling and do not represent a comprehensive study of emissions. While this short-term sampling effort does not address the cumulative impact of air emissions from natural gas operations in southwestern Pennsylvania, the sampling results provided basic information on the type of pollutants emitted to the atmosphere during selected phases of gas extraction operations in the Marcellus Shale formation.

Surveys of the atmosphere were conducted during a five-week period using the Department's Bureau of Laboratories Mobile Analytical Unit (MAU) to measure the concentrations of a target list of pollutants associated with gas drilling. The Mobile Analytical Unit used Gas Chromatography/Mass Spectrometry (GC/MS) and Open Path Fourier Transform Infrared (OP-FTIR or Open Path) samplers to screen for approximately 48 volatile organic compounds (VOCs), including methane and benzene. Additional air samples were collected in canisters over a 24-hour period and analyzed by the PA DEP Laboratory. The five sampling weeks focused on ambient air pollution levels near two different compressor stations, a condensate tank farm, a wastewater impoundment and a background site. The project goals include the short-term screening of ambient air concentrations of target pollutants near certain of Marcellus Shale gas drilling operations, assessing preliminary air quality impacts and determining if there were any immediate health risks from ambient pollutant concentrations to nearby residents or communities.

The short-term sampling program did detect concentrations of certain constituents of natural gas including methane, ethane, propane, and benzene in the air near Marcellus Shale drilling operations, most of which were detected during sampling at the two selected compressor stations. Results of the ambient air sampling initiative conducted in the southwest region did not identify concentrations of any compound that would likely trigger air-related health issues associated with Marcellus Shale drilling activities. Sampling for carbon monoxide, nitrogen dioxide, and ozone, did not detect levels above National Ambient Air Quality Standards at any of the sampling sites.

On July 23, 2012, the Department of Environmental Protection announced the commencement of a long-term, one-year air monitoring study of Marcellus Shale development in Washington County. The study will measure ambient airborne pollutants in an effort to determine potential air quality impacts associated with the processing and transmission of unconventional natural gas. The primary site of the long-term study will be downwind of the MarkWest Houston gas processing plant in Chartiers Township, Washington County, where DEP will monitor for ground-level ozone, particulate matter, carbon monoxide, nitrogen oxides, hydrogen sulfide and methane. The ambient air will also be tested for more than 60 volatile organic compounds, including hazardous air pollutants, and meteorological data will be collected continuously. DEP will also monitor for volatile organic compounds and collect meteorological data at three additional sites in Chartiers Township and Hickory Township, Washington County. Of the two additional Chartiers Township sites, one is upwind of the Houston gas processing plant, and the other is downwind of the MarkWest Brigich compressor station. The site in Hickory Township will be located downwind of the MarkWest Stewart compressor station.

DEP intends to collect at least one year of data and compare those results to national ambient air quality standards, then conduct a long-term risk analysis. The Washington County results and risk analysis will aid in determining the need for any further long-term sampling in other regions of the state.

11. Comment:

Further, it should be required that best available technology be used to control the emissions of all existing and proposed compressor stations.

Response:

As required by 25 Pa. Code §127.12, MarkWest has proposed what the Department considers to be Best Available Technology (“BAT”) for the proposed new sources at the Welling compressor station as detailed in the Department’s June 3, 2012, review memo for PA-63-00958A.

12. Comment:

“...cars...are required to employ effective pollution control devices such as combustion controls and catalytic converters. In fact, [Pennsylvania] requires that they be periodically inspected at our expense to ensure their existence and effective operation.”

Response:

As discussed in the Department’s June 3, 2012 review memo for PA-63-00958A, the proposed natural gas engines are equipped with automatic air/fuel ratio controllers and non-selective catalytic reduction (NSCR) units.

As discussed in the Department’s June 3, 2012 review memo for PA-63-00958A, MarkWest is required to conduct emissions testing to demonstrate compliance with the emissions restrictions in the Plan Approval.

- Commenter 19 discussed odors from the facility and observations using a FLIR GasFindIR HSX camera.

13. Comment:

“During a personal visit to the MarkWest site on the evening of May 3, 2012, members of my group witnessed firsthand putrid and oppressive odors emanating from the Welling Compressor Station near the front gate. FLIR video footage taken that evening, with a top-end FLIR camera that detects gas, illustrated the probable source of much of the stench: the tallest condensate tank on the site was spewing out hydrocarbons...”

Response:

To date, the Department has not received any complaints regarding odors from Welling. The Department recommends that, in the future, the commenter file a formal complaint with the Department if odors are observed outside of the property on which this or any other source is located such that an investigation by Department personnel can be conducted. During such an investigation, information regarding the nature and potential source of the complaint will be evaluated by the Department.

- Commenter 20 provided the following information:

14. Comment:

“I am commenting on the Welling Compressor station in Buffalo Township Washington PA and the proposed expansion planned there (PA-[63-]00958A) as a citizen of this area I have concerns. The air quality of our area is a huge concern. I do not know what it is exposing my children too, and neither do you. We have 2 stations in close proximity National Fuel and the Welling site they may be 2 miles apart as the bird flies. Yet both are considered minor sources of pollution. They are not considered together yet they should be! They alone or together are major contaminators. The air studies done in Pavilion Wyoming prove that overwhelmingly. Every state in the union has seen that and know[s] it is a true scientific study except it appears for Pennsylvania.

When I look at OSHA or ATSDR to get exposure levels of air toxics that are “Safe” the levels are measured in parts per million for so many hours. However in permits for compressor stations the PTE (potential to emit) tends to be calculated in tons for year. How can these be compared without a dispersion study?? No one is doing one? Why? We can give money to the industry for the huge Cracker plant but we [cannot] spend money or have them spend money to do this?? The difference between measuring PTE as tons per year vs. acute toxic dosage levels as ppm (parts per million) for 8 hours is beyond comprehension. It [cannot] be done. We must measure apples to apples to protect us. We as a society in our quest for advancement or monetary gain have poisoned ourselves in the past have we not learned that it can happen again???? The state must protect us and the air we breath[e].”

Response:

Comments regarding “stations in close proximity” to Welling and **aggregation** of emissions were addressed in the Department’s response to Comment #1.

Comments regarding **general air quality, ambient air quality standards, health effects, and potential to emit** have been addressed in the Department’s responses to Comment #9. Comments regarding a **dispersion study** with respect to air toxics are discussed in the Department’s responses to Comment #10.

- Commenter 21 provided the following information and also included ten (10) days of monitoring data for particulate matter obtained at the commenter’s home.

15. Comment:

“We are writing because we have a very grave concern. Our grave concern is not only for our own health and [well-being], but for the health and [well-being] of our family, our friends, and our neighbors. We have no doubt that to expand the Welling Compressor Station located in Buffalo Township, Washington County would certainly increase the very real health hazards we currently live with one hundred fold.

We did monitoring at our home for nine (9) days to estimate the scope of potential exposures to diesel and other emissions. Monitoring showed high levels of pm 2.5. The monitoring found episodes of PM which were compared to regulatory levels (NAAQS – National Ambient Air Quality Standards). On several days the PM 2.5 seemed to exceed the 24 hour EPA standard for half the day. The monitor also measured fine particulate. The fine particulate (PM 0.5) is a characteristic of diesel exhaust. The fine

particles were found to be 3 to 4 times over background levels. Those elevations also lasted for periods of several hours on different days.

We understand that such exposures are highly unusual even in large cities. It appears that the current diesel engines on the site are adding to our exposure to hazardous particulate. Based on this finding and the absence of modeled or monitored ambient air concentrations in our neighborhood, we are concerned that adding additional engines by permitting more gas compressors at the Welling Compressor Station site would increase our exposures to a known human toxin.

Because of these findings we are asking that prior to any additional permits that would locate more diesel engines, we request the state provide monitoring information for a sufficient period that would identify episodes of hazardous levels of particulate matter from [diesel] engines on the site. That would include trucks and other equipment including the large compressor engines.

We have learned Mark West has requested permission to expand the Welling Compressor Station. There are currently six (6) active compressors on the site; 2 Caterpillar 1,380 bhp natural gas fired compressor engines and 4 Waukesha 1,980 bhp natural gas fired compressor engines. Mark West has requested an additional five (5) Waukesha 1,980 bhp Natural Gas fired compressor engines be installed and put into service on the Welling site.

Prior to the installation and activation of these compressors in 2011, the area was completely rural and pastoral, with no toxic air pollution or nonstop sound pollution. Since 2011, we have had to listen to the perpetual drone of compressor engines. But far beyond that noisy intrusion into our quiet countryside, is the knowledge that along with the unending sound of the compressor engines come the continuous, unseen emissions of toxic chemicals into the air we must breathe to live. The installation of these additional compressor engines will double the amount of emissions our bodies must deal with daily!

Why is it that the Welling Compressor Station is considered a Minor Source for pollutants for permitting purposes when the Buffalo Compressor Station located very close by also contributes toxic emissions to our air? In addition, there are currently about a dozen compressor stations and probably twice that many wells, some of which are flaring, located within a twelve (12) mile radius of our property. The Houston Natural Gas Processing Plant is also only a few miles from where we are located. With this much natural gas activity occurring at any one time, why are the emissions from these multiple sources not looked at as an aggregate rather than each as a separate entity?

We believe that our family; children and grandchildren, neighborhood and township residents, and visitors to rural areas such as Buffalo Township deserve the same protection of their health as those citizens in urban areas.

Based on the attached findings and our very real concern for our future health and the future health of our family, neighbors and friends, we object to the installation of more of the same kind of engines near our property and request a public hearing to address these issues.

We urge you to oppose the expansion of the Welling Compressor Station. We also request regulation of air quality at the sites by the installation and continuous use of ambient air monitoring devices near the Welling Compressor Station and the Buffalo Compressor Station located less than two (2) miles away. To do any less will jeopardize and impact the health of not only those of us living in view of the compressor stations, but the health of all residents of Buffalo Township.”

Response:

Comments regarding Welling being regulated as a *minor source* are addressed in the Department's response to Comment #9. Comments regarding *health effects* and the environment (relating to *ambient air quality*) are addressed the Department's responses to Comment #10. Comments regarding *aggregation* of emissions from Welling with those of other surrounding sources are addressed in the Department's responses to Comment #1.

The Department operates the Commonwealth of Pennsylvania Air Monitoring System (COPAMS) air monitoring network. The COPAMS network encompasses both continuous and discrete methods of pollutant sampling. The continuous portion of the COPAMS network is a totally automatic, microprocessor-controlled system that consists of 52 remote stations throughout the Commonwealth. One of the COPAMS stations is located in the City of Washington approximately 5 linear miles from where the commenter collected the submitted data. None of the 24-hour averages at this station (on the same days as measured by the commenter) exceeded the 35 $\mu\text{g}/\text{m}^3$ (micrograms per cubic meter) standard for PM_{2.5}.

- Commenter 22 provided the following information.

16. Comment:

“Considering that Washington and neighboring counties already did not meet air quality attainment standards for THREE pollutants as of 2009, which was three years ago with many less compressor stations and gas drilling activities, we would strongly recommend that this plan be denied and all future plans, especially those related to the natural gas drilling industries, be seriously investigated. For the public's protection, we must look at the combined effects of diesel emissions—trucks, generators and compressors; frac and flowback pond volatiles; and the effects of flaring. EVERY human being in southwestern Pennsylvania breathes air, drinks water and eats food that is being impacted by the natural gas drilling industries at all phases of their operations.

We have watched the FLIR gas emission camera videos of the fugitive emissions from several compressor sites, including this one. (Please see www.marcellus-shale.us). Please schedule public hearings for this plan.

Please remember that the Pennsylvania Constitution, Article 1, Section 27 states[:]

“The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of the people.”

Again, we are writing to encourage denial of the proposed plan PA-63-00958A for the Welling Compressor Station.”

Response:

Comments regarding *air quality monitoring* are addressed in the Department's response to Comment #10; the referenced observations using a *FLIR camera* are addressed in the Department's response to Comment #13.

- Commenter 24 provided the following information.

17. Comment:

“The Center for Coalfield Justice has more than 100 members in the area that will be directly impacted by air emissions and other activities at the Welling Compressor Station, and these members are concerned about the impact that the compressor station will have on their health, property values, and the quality of their local environment.”

Response:

Comments regarding *health effects* are addressed in the Department’s response to Comment #9. Comments regarding the effect of industry on *property values* are typically addressed on a Municipal and/or County level through implementation and enforcement of zoning ordinances. However, secondary NAAQS were established to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Aspects of local environmental quality relating to *ambient air quality* are discussed in the Department’s response to Comment #9.

18. Comment:

“The Welling Compressor Station should be permitted as a major source and concerns for human health and the environment should be given significant weight in PA DEP’s consideration of the Plan Approval.”

Response:

Comments regarding Welling being regulated as a *minor source* are addressed in the Department’s response to Comment #9. Comments regarding *health effects* and the environment (relating to *ambient air quality*) are addressed the Department’s response to Comment #9.

19. Comment:

“The Center for Coalfield Justice is concerned about the Plan Approval for MarkWest’s Welling Compressor Station because this permit exemplifies a recent trend in which facilities are permitted to remain just below emission levels that would require a major source determination, and thus avoid heightened permit requirements and better pollution control technologies. This is an industry-wide pattern that demonstrates the priority placed on ease of permitting rather than protection of the health of the local people and environment.”

Response:

The use of *emission limitations* to limit a facility’s potential to emit (PTE) to a level *below the major source thresholds* is discussed in the Department’s response to Comment #9. The application of *Best Available Technology (BAT)* is discussed in the Department’s June 3, 2012 review memo for PA-63-00958A.

20. Comment:

Concern about the cumulative health impacts due to emissions from this compressor station as one of a battalion of natural gas related facilities, in particular cumulative cancer and non-cancer risks from formaldehyde emissions. While the review memo produced by PA DEP asserts that modeling results show risks from formaldehyde at levels below human health benchmarks, this provides little reassurance for those individuals living near Welling who will be exposed to up to 2.86 tons per year of emissions from a known carcinogen.

Response:

Based on air quality screening data, dispersion modeling, and risk assessments provided for formaldehyde emissions from other projects (that included multiple spark-ignition engines firing landfill gas) having a formaldehyde PTE at least twice that of Welling for which both cancer and non-cancer risks were found to be below the Department's human health risk benchmarks, the Department expects that cancer and non-cancer risks associated with formaldehyde emissions from Welling will be even lower than that of the referenced projects.

21. Comment:

"The Welling Compressor Station is a source of regional air pollution in an area containing several designated Environmental Justice Areas and therefore warrants the most stringent control technologies."

"The Welling Compressor Station at issue for the purpose of this Plan Approval is located approximately five to six linear miles west of designated Environmental Justice Areas in Washington, PA."

Response:

According to 25 Pa. Code §121.1, *air pollution* is defined as:

"The presence in the outdoor atmosphere of any form of contaminant, including, but not limited to, the discharging from stacks, chimneys, openings, buildings, structures, open fires, vehicles, processes or any other source of any smoke, soot, fly ash, dust, cinders, dirt, noxious or obnoxious acids, fumes, oxides, gases, vapors, odors, toxic, hazardous or radioactive substances, waste or other matter in a place, manner or concentration inimical or which may be inimical to public health, safety or welfare or which is or may be injurious to human, plant or animal life or to property or which unreasonably interferes with the comfortable enjoyment of life or property."

Based on the Department's review and assessment of MarkWest's Plan Approval application for the construction and modification of sources and controls at the Welling compressor station, Welling will not cause *air pollution*, as defined. In addition, conditions have been included in the Plan Approval to ensure that the facility will not cause air pollution.

With respect to Environmental Justice Areas, the Department's *Environmental Justice Public Participation Policy* (DOCUMENT ID: 012-0501-002, effective April 24, 2004; revised December 20, 2004) provides *direction* and *guidance* to DEP staff on how to identify an Environmental Justice Area using the area of concern as it relates to specific permit applications and demographic data, and how to enhance public participation during the permitting process for some permits in these areas. As noted by the commenter, Welling is located "approximately five to six miles from an area designated as an Environmental Justice Area".

An application for a *trigger permit* in an Environmental Justice Area, or, in an area within the project's *area of concern*, which is defined in the policy as, "a circle defined by a radius of one-half mile from the center of a proposed permit activity or, where an activity is not centralized, an area extending one-half mile beyond the boundary of the proposed activity", is subject to enhanced public participation under the policy.

The policy also established a list of *trigger permits*, which are for those DEP regulated activities that may lead to significant public concern due to potential impacts on human health and the environment. For the purposes of air permits, which includes a *construction permit* (or *Plan Approval* as referred to in the Pennsylvania Code), issued under The Air Pollution Control Act, the policy identifies proposed permits for both a *new major source of hazardous air pollutants or criteria pollutants* and a *major modification of a major source (changes that could result in an increase in emissions or a facility expansion)* as trigger permits.

Since the proposed plan approval application does not propose either a *new major source* or a *major modification of a major source*, the proposed permit is not considered a trigger permit. The proposed activity is also located outside of the *area of concern*, and thus, on both counts, is not subject to the *Environmental Justice Public Participation Policy*.

Requiring "the most stringent control technologies" is related to the application of **Best Available Technology (BAT)** and is discussed in the Department's June 3, 2012 review memo for PA-63-00958A.

- Commenter 25 provided information relating to **health effects** which have been addressed in the Department's responses to Comment #9. The **request for a public hearing** on this proposal is addressed in the conclusion to the Department's response to Comment #9.
- Commenter 26 provided the following information.

22. Comment:

"Plan Testing Requirements do not specify the equipment requirements for use of a portable analyzer (Plan II, # 005 d, p. 13). Plan requires MarkWest to submit a "one-time protocol" for the use of a "portable analyzer" (Plan II, # 005 d, p. 13.). Plan does not state any specific equipment requirements for such an analyzer, nor is there any reference from other sources to such a requirement. [Condition] should be amended to include required specifications for a portable analyzer."

Response:

The use of portable analyzers is subject to the requirements specified in Revision 3.3 of the Department's Source Testing Manual (Document ID 274-0300-002, revised November 11, 2000). However, since each previously installed and proposed engine at Welling is subject to the testing requirements specified in 40 CFR Part 60 Subpart JJJJ—*Standards of Performance for Stationary Spark Ignition (SI) Internal Combustion Engines (ICE)*, all testing procedures, including procedures and specifications specific to portable analyzers and the submittal of pretest protocols, must meet the requirements therein specified. As such, the following statement from the above referenced condition (Plan Approval PA63-00958A, Section C., Item II, # 005 d, Page 13) will be removed from the Plan Approval Testing Requirements:

“The Owner/Operator shall submit three copies of a onetime protocol to the Department for review for the use of a portable analyzer and may repeat portable analyzer testing without additional protocol approvals provided that the same method and equipment are used.”

23. Comment:

“Monitoring Requirements (Plan III # 006, p. 14) do not meet DEP’s own stated standards of BAT (Best Available Technology) for LDAR (Leak Detection [a]nd Remediation [Repair]).”

Response:

Monitoring requirements are not subject to Best Available Technology.

24. Comment:

“Plan [Approval Condition] IV # 007 (p. 15) must be amended to specifically include computer data giving log and alert information of abnormal events.”

Response:

Appropriate recordkeeping and malfunction reporting requirements are included in the Plan Approval conditions.

The following additional recordkeeping requirement has been added to the referenced condition:

1. Daily log of site visual inspections indicating that the flare pilot light is on and the flare is operational.

The following additional requirement has been added to Section C., Part II—*Testing Requirements*, #006:

Within 180 days of issuance of this Authorization, the owner or operator shall perform a compliance demonstration to ensure that the Vapor Recovery Unit (VRU) is operating in accordance with manufacturer specifications and parameters.

25. Comment:

“Plan [Approval Condition] # 009 (p. 15) should be amended to require specific listing of methane data including the formula used to calculate CO₂e from methane amounts.

There is well accepted science demonstrating that methane is a greenhouse gas (GHG) many times more potent than CO₂. It is customary to relate GHG potency to that of CO₂ through a formula that adjusts the potency ratio based on an estimate of the amount of time the gas being compared to CO₂ persists in the atmosphere. The difference between the “raw” potency number and the adjusted number for methane is significant — nearly half an order of magnitude. That means that remediation of GHG emissions with specific time goals must be mindful of those goals in determining whether the raw or adjusted number for CO₂e is being used. A plan approval permittee should be required to break down CO₂e numbers so that all gases where the CO₂e is calculated using a formula for persistence in the atmosphere can be evaluated independently. The public is entitled to know if GHG remediation is being achieved based on 20-year numbers vs. 100-year numbers.”

Response:

CO₂e emissions for Welling were calculated using a collection of manufacturer data, information obtained from GRI-GlyCalc, a HySIS evaluation for determining potential storage tank emissions, and EPA emission factors, including applicable emission factors from 40 CFR Part 98 Subpart A—*General Provision*, 40 CFR Part 98 Subpart C—*Mandatory Greenhouse Gas Reporting for General Stationary Fuel Combustion Sources*, and 40 CFR Part 98 Subpart W—*Petroleum and Natural Gas Systems*. The CO₂e emissions total included all contributions from potential emissions of CO₂, CH₄, and N₂O.

26. Comment:

“Exemption from reporting of malfunctions that are “reasonably preventable failures” (Plan # 010 a, p. 15) is outrageous and unsupportable.

Response:

The Department’s standard plan approval and permit condition language has recently been revised with respect to how *malfunction* is defined. The malfunction reporting condition will be revised as follows in the plan approval for Welling:

Malfunction reporting shall be conducted as follows:

- a. The owner or operator shall report to the Department each malfunction that occurs at this facility. For purposes of this condition, a malfunction means any failure to operate air pollution control equipment and/or process equipment in a normal or usual manner, consistent with good operating practices and the conditions of this authorization.
- b. When the malfunction may immediately impact public health and safety or the environment or when it is reasonable to believe that the malfunction may result in citizen complaints, the notification shall be made to the Department by telephone no later than one hour after discovery of the incident. The telephone number in subpart (f), below, shall be used to report the malfunction. Examples of malfunctions that may result in citizen complaints include, but are not limited to: unusually large dust plumes, heavy smoke, or a spill or release that results in a malodor that is detectable outside the property of the person on whose land the source is being operated.
- c. The notice shall describe the following:
 - i. Name and location of the facility;
 - ii. Nature and cause of the malfunction;
 - iii. Time when the malfunction or breakdown was first observed;
 - iv. Expected duration of excess emissions and the malfunction; and
 - v. Estimated rate of emissions.
- d. The owner or operator shall immediately notify the Department by telephone when corrective measures have been accomplished. The telephone number in subpart (f), below, shall be used to report the completion of corrective measures
- e. Malfunctions that do not appear to be likely to pose a danger to public health and safety or the environment or will not in citizen complaints shall be reported within 24 hours or on the next business day. The telephone number in subpart (f), below, shall be used to report the malfunction.
- f. Malfunctions shall be reported to the Department at the following address and telephone number:

PADEP
Office of Air Quality
400 Waterfront Drive
Pittsburgh, PA 15222-4745
(412)442-4000

27. Comment:

“DEP’s assessment of the potential of Welling to cause adverse health effects is severely flawed by failure to consider an industry-relevant dispersion study that takes into account acute effects.

“The dispersion study cited by DEP in its Review Memo is for a *landfill*. Using such a study to evaluate a compressor station is questionable at best.”

Response:

The two dispersion studies that were referenced by the Department were for two different facilities having multiple *landfill gas-fired engines*, not for a *landfill* as asserted by the commenter. Both studies modeled a group engines from which formaldehyde emissions were greater than that of Welling. Since, in the first case, cancer and non-cancer risks were found to be below the Department’s human health risk benchmarks, and in the second case, ambient formaldehyde concentrations were found to be less than the Department’s acute (1-hour average) and chronic (5-year average) toxicity benchmarks and the long-term hazard quotient and calculated cancer risk thresholds, the Department is confident that cancer and non-cancer risks and acute (1-hour average) and chronic formaldehyde concentrations associated with formaldehyde emissions from Welling will be even lower than that of the referenced projects.

28. Comment:

“Review Memo PTE calculations do not show a margin of error. Review Memo at page 12 shows a PTE for VOCs of 49.2 tpy. What is the margin of error in this calculation? A mere 1.6% separates this number from qualification of Welling as a Major Source. If DEP did not assess the margin of error in this PTE calculation, then DEP has no basis for judging that Welling is not a Major Source. How many blowdowns would it take to achieve that 1.6%? There is no evidence from the File Review documents for Plan that DEP assessed this question. Consequently: There is no real assurance from the File Review documents for Plan that Welling is not a Major Source for VOCs. The conclusion here is clear: DEP should deny approval of Plan and require MarkWest to reapply under Major Source procedures unless it can demonstrate with best available science that its error rate for VOCs — specifically taking into account blowdown, pressure relief, and fugitive emissions — is less than 1.6%.”

Response:

As noted in the Department’s response to Comment #9 with respect to *potential to emit*, the emission limitations contained in proposed Plan Approval PA-63-00958A have been used to limit the subject facility’s potential to emit to a level below the major source thresholds for all NSR-regulated pollutants, thus establishing that Welling is a minor source.

As discussed in the Department’s response to Comments #7, MarkWest has reduced its engine inventory from five (5) proposed Waukesha P9390GSI engines to four (4), such that Welling remains a minor source of GHG. As such, the PTE for VOC will be reduced by the incremental amount associated with operation of one of these engines, or 2.3 tpy. Therefore, the total VOC PTE from Welling has been revised to 46.9 tpy. Additionally, on January 24, 2012, testing was conducted on one of the Waukesha P9390GSI engines at Welling which indicated that *actual* VOC emissions from this engine were less than 33% of the federally enforceable restriction established in the current (and the subject proposed) Plan Approval.

- Commenter 27 provided the following information.

29. Comment:

“I urge the Department to require much more stringent controls on the Welling Compressor Station upgrade than those described in the permit application (perhaps BACT). I urge these controls because MarkWest is projecting that the upgraded Welling Compressor Station will emit 60.81 tons per year of NOx and 49.2 tons per year of VOCs. The VOC emissions are barely below the 50 [tons per year threshold] that requires more stringent controls. One leaky component and the station will go over the limit.”

Response:

Since potential to emit of Welling is below the major source thresholds for all NSR-regulated pollutants, Welling is a minor source and not subject to BACT. *Best Available Technology* is discussed in the Department’s June 3, 2012 review memo for PA-63-00958A.

Potential VOC emissions were estimated using EPA emission factors for VOC emissions from equipment leaks and were included in the facility-wide PTE for Welling.

Commenters 28-32 each expressed concerns related to *health effects, general air quality, and risk assessment*, each of which has been addressed in the Department’s responses to Comment #9.

- Commenter 35 provided the following information.

30. Comment:

“I am aware of the consequences that compressor stations have on the environment and human health, and I am concerned that the DEP has no system to monitor the aggregate emissions of several compressor stations in one area.”

Response:

The Department of Environmental Protection announced the commencement of a long-term, one-year air monitoring study of Marcellus Shale development in Washington County. The study will measure ambient airborne pollutants in an effort to determine potential air quality impacts associated with the processing and transmission of unconventional natural gas. Further discussion of this monitoring program is discussed in the Department’s response to Comment #10.

- Commenters 36 and 37 provided the following information.

31. Comment:

“The emission guidelines listed in the announcement of the plan do not sufficiently take into account the aggregate air pollution conditions, and the significant increase this one permit will make to air pollution in the immediate area and broader region.”

Response:

Comments regarding *regional air quality modeling* and *air quality monitoring* are discussed in the Department's responses to Comment #9.

32. Comment:

"Many of the substances released by this facility make significant contributions ground level ozone, a substance that harms people, farm animals and even plants."

"A substantial portion of the population in that region is susceptible to air pollution and granting this permit for the benefit of one industry will significantly harm people's health."

"A proposed industry plan must demonstrate that it will not harm Pennsylvania people or resources; the Welling facility expansion does not meet that criteri[on]."

Response:

As noted in the Department's response to Comment #9, the Clean Air Act required EPA to set National Ambient Air Quality Standards ("NAAQS") for pollutants considered harmful to public health and the environment and establishes two levels of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Welling is classified as a natural minor facility and as such is not required to perform modeling to demonstrate that the emissions from this facility will not cause or contribute to a violation of any NAAQS.

33. Comment:

"This facility will decrease property value in the area and discourage long-term economic development."

Response:

Comments regarding the effect of industry on property values are typically addressed on a Municipal and/or County level through implementation and enforcement of zoning ordinances. However, secondary NAAQS were established to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Aspects of local environmental quality relating to *ambient air quality* are discussed in the Department's response to Comment #9.

Revisions to Plan Approval Conditions

Based on recent changes to the Department's standard language regarding malfunction reporting and public comments received on proposed Plan Approval PA-63-00958A for construction of new and modification of previously installed sources and controls herein referenced at the MarkWest Welling Compressor Station, the following changes will be made to conditions of the subject authorization:

1. The portion of item "d." in Condition #005 of Section C—*Site Level Plan Approval Requirements, Part II—Testing Requirements* (marked with strikethrough below) conflicted with applicable requirements of 40 CFR Part 60 Subpart JJJJ testing requirements regarding the use of portable analyzers, and has been revised as follows:

d. The Owner/Operator shall submit three (3) copies of a pre-test protocol to the Department for review at least 45 days prior to the performance of any EPA reference method stack test. ~~The Owner/Operator shall submit three copies of a onetime protocol to the Department for review for the use of a portable analyzer and may repeat portable analyzer testing without additional protocol approvals provided that the same method and equipment are used.~~ All proposed performance test methods shall be identified in the pre-test protocol and approved by the Department prior to testing.

2. Source 114—[*WAUKESHA P9390GSI COMPRESSOR ENGINE 9 (1980 BHP)*] and Control C114—[*WAUKESHA ENGINE 9 THREE-WAY CATALYST*] and the associated PERMIT MAPS have been removed from Section A.—*Plan Approval Inventory List* as discussed in the Department's response to Item #1. This text will no longer appear in the Plan Approval conditions where elsewhere included.

3. The following language has replaced, in entirety, Condition #010 of Section C—*Site Level Plan Approval Requirements, Part V—Reporting Requirements*:

Malfunction reporting shall be conducted as follows:

- a. The owner or operator shall report to the Department each malfunction that occurs at this facility. For purposes of this condition, a malfunction means any failure to operate air pollution control equipment and/or process equipment in a normal or usual manner, consistent with good operating practices and the conditions of this authorization.
- b. When the malfunction may immediately impact public health and safety or the environment or when it is reasonable to believe that the malfunction may result in citizen complaints, the notification shall be made to the Department by telephone no later than one hour after discovery of the incident. The telephone number in subpart (f), below, shall be used to report the malfunction. Examples of malfunctions that may result in citizen complaints include, but are not limited to: unusually large dust plumes, heavy smoke, or a spill or release that results in a malodor that is detectable outside the property of the person on whose land the source is being operated.
- c. The notice shall describe the following:
 - i. Name and location of the facility;
 - ii. Nature and cause of the malfunction;
 - iii. Time when the malfunction or breakdown was first observed;
 - iv. Expected duration of excess emissions and the malfunction; and
 - v. Estimated rate of emissions.
- d. The owner or operator shall immediately notify the Department by telephone when corrective measures have been accomplished. The telephone number in subpart (f), below, shall be used to report the completion of corrective measures

- e. Malfunctions that do not appear to be likely to pose a danger to public health and safety or the environment or will not in citizen complaints shall be reported within 24 hours or on the next business day. The telephone number in subpart (g), below, shall be used to report the malfunction.
- f. Malfunctions shall be reported to the Department at the following address and telephone number:

PADEP
Office of Air Quality
400 Waterfront Drive
Pittsburgh, PA 15222-4745
(412)442-4000

- 4. In Condition #007 of Section C—*Site Level Plan Approval Requirements*, Part IV—*Recordkeeping Requirements*, item “m.” has been removed and item “l.” has been revised as follows:
-

- i. Daily log of site visual inspections indicating that the flare pilot light is on and the flare is operational.

- 5. Condition #006 of Section C—*Site Level Plan Approval Requirements*, Part II—*Testing Requirements* has been added:
-

Within 180 days of issuance of this Authorization, the owner or operator shall perform a compliance demonstration to ensure that the Vapor Recovery Unit (VRU) is operating in accordance with manufacturer specifications and parameters.

- 6. Item “a.” in Condition #016 of Section C—*Site Level Plan Approval Requirements*, Part VII—*Additional Requirements* has been revised as follows:
-

- a. Eight (8) Waukesha P9390GSI, 1980 bhp (@ 1200 rpm) natural gas-fired compressor engines, each equipped with Johnson Matthey three-way catalysts and Altronic (or equivalent) automatic air/fuel ratio controllers.

- 7. Section H.—*Miscellaneous* has been revised as follows:
-

The facility's potential-to-emit (PTE) for all sources in any consecutive 12-month period is:

55.4 tons of CO (CARBON MONOXIDE)
57.0 tons of NO_x (NITROGEN OXIDES)
<1.0 tons of SO_x (SULFUR OXIDES)
5.5 tons of PM-10 (PARTICULATE MATTER < 10 MICRONS)
46.9 tons of VOC (VOLATILE ORGANIC COMPOUNDS)**
2.7 tons of a SINGLE HAP (HAZARDOUS AIR POLLUTANT)
7.1 tons of ALL HAP COMBINED* **
92,100 tons of GHG (Greenhouse Gases) or CO₂e (CARBON DIOXIDE EQUIVALENT)

*Includes 2.7 tons of formaldehyde (HCHO).

**Includes projected fugitive emissions from equipment leaks, vented blowdowns, and storage tank VRU.

Facility Summary

The following equipment will be authorized for installation and temporary operation as the Welling Compressor Station upon issuance of Plan Approval PA-63-00958A:

- Eight (8) Waukesha P9390GSI 1,980-bhp natural gas-fired rich-burn compressor engines, each equipped with an automatic air/fuel ratio controller and a Johnson Matthey non-selective catalytic reduction unit (NSCR, or three-way catalyst).
- Two (2) Caterpillar G3516B 1,380 bhp natural gas-fired ultra-lean burn compressor engines, each equipped with an automatic air/fuel ratio controller and a Miratech oxidation catalyst.
- One (1) 500 bbl gunbarrel separation tank.
- One (1) 400 bbl saltwater tank.
- Three (3) 400 bbl condensate tanks.
- One (1) vapor recovery unit (VRU) designed for 100% capture and 98% control of storage tank VOC and HAP emissions.
- One (1) 130 MMscfd NATCO TEG dehydrator equipped with one (1) NATCO 2.5 MMBtu/hr natural gas-fired reboiler fitted with one (1) 48" Superior Fabrication flare rated at 1500 scfm and 2.1 MMBtu/hr.
- Two (2) John Deere 6068HF285 197-bhp diesel engines (each equipped with a Miratech IQ-12-05-L1 oxidation catalyst) for emergency power generation.

As part of this Plan Approval for Welling Compressor Station, the Department has established Federally enforceable emission restrictions applicable to the above identified sources at the facility to limit the facility's potential to emit (PTE). The following tables identify the emission restrictions that will be established upon authorization of PA-63-00958A at the Welling Compressor Station, and are established for the specified sources, as follows:

Table 1—Federally Enforceable Emission Restrictions—All Equipment

Source ID	Description	NOx Emission Rate		CO Emission Rate		VOC Emission Rate ¹		HCHO Emission Rate		HAP Emission Rate	
		(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
101	Caterpillar G3516B 1,380 bhp	1.52	6.66	0.37	1.60	0.37	1.60	0.12	0.53	0.17	0.74
102	Caterpillar G3516B 1,380 bhp	1.52	6.66	0.37	1.60	0.37	1.60	0.12	0.53	0.17	0.74
103	Waukesha P9390GSI 1,980 bhp	0.87	3.82	1.14	4.97	0.53	2.30	0.044	0.20	0.08	0.52
104	Waukesha P9390GSI 1,980 bhp	0.87	3.82	1.14	4.97	0.53	2.30	0.044	0.20	0.08	0.52
105	Waukesha P9390GSI 1,980 bhp	0.87	3.82	1.14	4.97	0.53	2.30	0.044	0.20	0.08	0.52
106	Waukesha P9390GSI 1,980 bhp	0.87	3.82	1.14	4.97	0.53	2.30	0.044	0.20	0.08	0.52
110	Waukesha P9390GSI 1,980 bhp	0.87	3.82	1.14	4.97	0.53	2.30	0.044	0.20	0.08	0.52
111	Waukesha P9390GSI 1,980 bhp	0.87	3.82	1.14	4.97	0.53	2.30	0.044	0.20	0.08	0.52
112	Waukesha P9390GSI 1,980 bhp	0.87	3.82	1.14	4.97	0.53	2.30	0.044	0.20	0.08	0.52
113	Waukesha P9390GSI 1,980 bhp	0.87	3.82	1.14	4.97	0.53	2.30	0.044	0.20	0.08	0.52
108	John Deere 197-bhp diesel	1.16	5.10	0.04	0.19	0.09	0.51	-	-	-	-
118	John Deere 197-bhp diesel	1.16	5.10	0.04	0.19	0.09	0.51	-	-	-	-
C107	Flare, 98% control of dehy VOC	0.48	2.08	2.59	11.35	1.80	7.87	-	-	-	-
107A	Reboiler burner, 2.5 MMBtu/hr	0.2	0.83	0.16	0.72	0.01	0.05	-	-	0.24	1.04
119/C119	Tanks/VRU	-	-	-	-	1.04	4.57	-	-	-	-
109	Fugitive emissions	-	-	-	-	1.12	4.94	-	-	0.08	0.35
109	Blowdowns and ESD ¹ events	-	-	-	-	1.57	6.86	-	-	0.01	0.03
Total		13.00	57.0	12.69	55.4	10.71	46.9	0.59	2.7	1.31	7.1

¹Emergency Shutdown

Table 2—Federally Enforceable Emission Restrictions for Each Engine

Engine	NOx Emission Rate		CO Emissions Rate		VOC Emissions Rate		HCHO Emissions Rate	
	(g/bhp-hr)	(lb/hr)	(g/bhp-hr)	(lb/hr)	(g/bhp-hr)	(lb/hr)	(g/bhp-hr)	(lb/hr)
Caterpillar G3516B	0.5	1.52	0.12	0.37	0.12	0.37	0.04	0.12
Waukesha P9390GSI ¹	0.20	0.87	0.26	1.14	0.12	0.53	0.01	0.044

¹VOC emissions includes HCHO.

Recommendation

Mark West Liberty Midstream and Resources, LLC has shown that the emissions will be minimized through the use of appropriate BAT for installation of proposed and modified sources and temporary operation of the previously installed and additional/modified sources at the Welling Compressor Station. Since this plan approval authorizes continued temporary operation of previously installed sources, I recommend issuance Plan Approval PA-63-00958A for a period of 180 days. Additionally, since this Plan Approval incorporates all proposed and previously installed sources at Welling, PA-63-00958 will be inactivated in all Department databases upon issuance of PA-63-00958A.