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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2992
Plant ID No.:	103-00051
Applicant:	HG Energy, LLC
Facility Name:	Hoyt 401
Location:	Wetzel County
NAICS Code:	211111
Application Type:	Construction
Received Date:	September 27, 2012
Engineer Assigned:	Joe Kessler
Fee Amount:	$2,000
Date Received:	$1,000 (October 1, 2012) $1,000 (October 16, 2012)
Complete Date:	October 23, 2012
Due Date:	January 21, 2013
Applicant Ad Date:	October 3, 2012
Newspaper:	*The Wetzel Chronicle*
UTM's:	Easting: 531.104 km Northing: 4,383.692 km Zone: 17
Description:	Permit for construction and operation of a natural gas production facility at the existing Hoyt 401 well-pad.

DESCRIPTION OF PROCESS

HG Energy, LLC (HG Energy) has submitted a permit application for the proposed construction and operation of a natural gas production facility primarily consisting of six (6) wells, nine (9) small gas-fired process heaters, five (5) condensate tanks, five (5) produced water tanks, an enclosed vapor combustor, and two temporary (2) flowback flares. Truck loading of condensate and produced water will also take place at the site.

The proposed facility will operate in two phases: the temporary "flowback" phase and the production phase. The flowback phase will occur first after the wells are hydraulically fractured. During this phase, the wells will produce natural gas and large amounts of fluids (primarily the recovered fracturing fluids). The wells will also be in an unstable state, with varying gas output. When the wells are in flowback, the produced gas and liquids will be sent through a simple flowback separator and the gas will be flared. The liquids will be sent to the appropriate storage tank (7S -

16S).

While HG has applied for the use of two flares (A20S, B20S), depending on the outflow from the wells, only one flare may be necessary. HG has estimated that the worst-case aggregate amount of gas that will need to be flared during flowback will not exceed 60.54 mmscf. The flowback phase is also estimated to last no more than 84 days (2,016 hours). Each flare will be designed and operated to meet the control device requirements of §60.18 so as to achieve an organics destruction efficiency of 98%.

When the gas flow from the wells stabilizes, and the amount of fracking water coming out of the well reduces to acceptable levels, the flowback phase will be completed and the flares will no longer be needed. At that time, the proposed facility will become a production facility - gas will be sent into the sales pipeline. When in the production phase, the condensate, gas, and water produced from the wells are first sent through the 1.00 mmBtu/hr GPU Burners (1S - 6S) to condition the gas for separation and to prevent line freezing. This stage is also the first of the separation stages - as the gas at this point is routed the production pipeline for transportation.

After the GPU Burners and initial separation of the gas, the fluids (condensate and produced water) will be sent to three (3) low pressure towers. Each tower receives process heat from a 0.50 mmBtu/hr gas-fired heater (20S - 22S). When the fluids enter the low-pressure zones of the towers, the remaining methane is flashed off from the liquids. The flash-gas from the three (3) low pressure towers is either captured via a flash-gas electric compressor engine and sent to the production pipeline for transportation or, in the case of an electric outage or other technical problem, is routed to an enclosed vapor combustor (18S) for destruction. The vapor combustor will be designed and operated so as to achieve an organics destruction efficiency of 98%.

Produced water from the low pressure towers will flow into five (5) 210-bbl produced water tanks (12S - 16S) and condensate will flow to the five (5) 210-bbl condensate storage tanks (7S - 11S). Condensate and produced water will be transported off site via a truck loading station (23S, 24S). Potential losses from the loading operations will be controlled by utilizing vapor return - which will capture a minimum of 70% of the potential emissions from the loading operations. The captured gas will be routed to the vapor combustor for control.

Working, breathing and flashing vapors from the storage tanks will be routed to the flash-gas compressor to be pumped into the production line or sent to the vapor combustor.

SITE INSPECTION

On November 1, 2012, the writer conducted an inspection of the proposed site of a natural gas production facility at the existing Hoyt 401 well-pad. The proposed existing pad is located in a remote and rural location in Wetzel County approximately 3.2 miles southeast of Wileyville at the end of a new access road created off of County Route (CR) 58 (Hoyt/Criswell Ridge Road). CR 58 is a gravel road which appeared, at the time of the inspection, to have been recently improved so as to accommodate the large vehicles needed to conduct drilling operations. The existing Hoyt 401 pad was located approximately 0.50 miles south of CR 58 at the end of a newly built access road. No occupied residences could be verified to be in proximity to the pad. The pad, at the time of the inspection appeared to have been drilled and capped prior to fracturing. The following is a picture of the proposed 404 pad taken on the day of the inspection:

Directions: [Latitude: 39.59765, Longitude: -80.63773] Travelling east on WV State Route (SR) 7, turn south onto CR 17 for approximately 1.1 miles. When reaching the CR 58 (Hoyt/Criswell Ridge Road) turn left and proceed for approximately 1.4 miles (continue to bear left on the main gravel road) and then turn right onto the Hoyt 401 access road. Proceed another 0.5 miles to the location of the existing well-pad.

AIR EMISSIONS AND CALCULATION METHODOLOGIES

HG Energy included in the permit application air emissions calculations for the equipment and processes at the Hoyt 401 natural gas production facility. The following will discuss in detail the calculation methodologies used by HG Energy to calculate the potential-to-emit (PTE) of the proposed facility.

Flowback Flaring

As stated above, gas produced by the fractured wells during the flowback period is sent to the flares for destruction. The emissions from this flaring are based on, where appropriate, both emission factors obtained from appropriate sections of AP-42 (AP-42 is a database of emission

factors maintained by USEPA) or on mass balance calculations using constituent gas properties obtained from a gas analysis performed on another Marcellus gas well. A 98% destruction efficiency (based on a requirement to meet the control device requirements given under 45CFR§60.18) was applied to the uncontrolled emissions of methane and organic Hazardous Air Pollutants (HAPs) to determine emissions.

Annual emissions were based on flaring an aggregate maximum of 60.54 mmscf (72,092.16 mmBtu) of gas during the flowback period from all wells. Short-term emissions from the flare will vary greatly based on the produced gas volume. It is possible that extremely high volumes of gas will be flared for short periods of time that approach the listed maximum capacity of the flare: 2.08 mmscf/hr. Therefore, the calculated hourly emission rates were based on the annual amount of flared gas as averaged over the projected worst-case hours of operation (29,800 scf/hr). This is a reasonable method to estimate a more representative short-term emission rate. A gas heat content of 1,200 Btu/scf was used in the calculations.

The PTE of flaring the gas produced from the wells and the emission factor/source are given in the following table:

Table 1: Flowback Flaring PTE

Pollutant	Emission Factor	Source	Hourly (lb/hr)	Annual (ton/yr)
CO	0.37 lb/mmBtu	AP-42, Table 13.5-1	13.23	13.34
NO_X	0.07 lb/mmBtu	AP-42, Table 13.5-1	2.43	2.45
VOCs	5.50 lb/mmscf	AP-42, Table 1.4-2/ Marcellus Gas Analysis	13.80	13.91
PM(1)	7.60 lb/mmscf	AP-42, Table 1.4-2	0.23	0.23
SO_2	0.60 lb/mmscf	AP-42, Table 1.4-2	0.02	0.02
HAPs	mass balance @ 98% destruction rate	Marcellus Gas Analysis	13.64	13.74
CH_4	mass balance @ 98% destruction rate	Marcellus Gas Analysis	n/a	18.47
CO_2	53 kg/mmBtu	40 CFR 98 Tables C-1	n/a	4,213.39
CO_2e(2)	n/a	n/a	n/a	4,601.26

(1) All particulate matter expected to be $PM_{2.5}$ or less.

(2) Based on multiplying the mass amount of emissions for each of the six greenhouse gases by the gas's associated global warming potential published at Table A-1 to Subpart A of 40 CFR Part 98 - Global Warming Potentials. Used to determine major source status of facilities under 45CSR14.

Gas-Fired Process Heaters/Flare Pilot Lights

Emissions from the natural gas-fired process heaters (1S - 6S and 20S - 22S) and the pilot light on the vapor combustor (17S) were based on the emission factors provided for natural gas

combustion as given in AP-42 Section 1.4. Hourly emissions were based on revised the maximum design heat input (MDHI) of each heater and annual emissions were based on an annual operation of 8,760 hours. A heat content of the gas of 1,200 Btu/scf was used in the calculations.

Storage Tanks

Working and breathing emissions from the five (5) 8,820 gallon produced-water and five (5) 8,820 gallon condensate storage tanks were based on the TANKS 4.09d program as provided under AP-42, Section 7. Emissions from flashing in the tanks were calculated using E&P Tanks. Input and summary sheets for both programs were included in the permit application. Hazardous Air Pollutant (HAPs) emissions were proportionally based on HAP compositions taken from speciated liquids analysis "from another operator in WV." All uncontrolled emissions from the storage tanks are routed to the vapor combustor for control. The vapor combustor will have a minimum combustion efficiency of 98% for organics.

Truck Loading

Air emissions from (condensate and produced water) truck loading operations occur as both fugitive emissions and as controlled emissions emitted from the vapor combustor. HG Energy has proposed a minimum vapor collection efficiency of 70% (i.e., 30% of emissions go uncaptured and are released as fugitives) and, as previously noted, a minimum vapor combustor control efficiency of 98%. The 70% is based on language in AP-42 Section 5.2 that indicates this number is appropriate for sources not subject to Maximum Achievable Control Technology (MACT)-level leak testing. The aggregate efficiency of the whole system is proposed, therefore, to be 68.6% control of the potential uncontrolled VOC emissions (0.70 x 0.98 = .686).

The emission factor used to generate the uncontrolled VOC emissions is based on Equation (1) of AP-42 Section 5.2-4. In this equation, HG Energy used variables specific to the liquids loaded and to the method of loading - in this case "submerged filling - dedicated normal service." Additionally, worst-case hourly emissions were based on a maximum loading rate of 7,500 gal/hour and 2,300,000 gal/year of both produced water and condensate. As noted 70% of the uncontrolled emissions are assumed to be captured and sent to the vapor combustor for control while the remaining 30% is emitted to the atmosphere as fugitives.

Hazardous Air Pollutant (HAPs) and methane emissions were proportionally based on a gas composition analysis taken from another operator in WV as HG Energy does not yet have any existing producing Marcellus wells to analyze.

Fugitives

HG Energy based their fugitive equipment leak calculations on emission factors and control methodology effectiveness taken from the document EPA-453/R-95-017 - "Protocol for Equipment Leak Emission Estimates." Emission factors were taken from Table 2-4 and no control efficiency, as based on a Leak Detection and Repair (LDAR) protocol, was applied. Methane, VOC, and total HAP percentages were based on the gas analysis supplied in the permit application.

Vapor Combustor

The vapor combustor will potentially receive emissions from the low pressure towers, the storage tanks, and the truck loading station. The calculated amount of emissions received is determined by the calculation methodologies described above. A 98% control was applied to the uncontrolled VOC/HAP/methane emissions received by the vapor combustor. The emissions of NO_x and CO from the combustion of the VOCs/methane were based on emission factors taken from a TCEQ guidance document for flares and vapor oxidizers. PM emissions (assumed to be all $PM_{2.5}$ or less) were based on AP-42 Section 1.4. GHG emissions from the vapor combustor were based on emission factors from 40 CFR 98, Tables C-1 and C-2.

Emissions Summary

Based on the above estimation methodology, which is determined to be appropriate, the PTE of the proposed Hoyt 401 natural gas production facility is given in the following tables:

Table 2: Facility-Wide Aggregate Hourly (lb/hr) Criteria Pollutant PTE Summary.

Source	CO	NO_x	PM[(1)]	SO_2	VOCs	HAPs
Process Heaters/Pilot Lights[(2)]	0.46	0.55	0.04	<0.01	0.03	0.01
Vapor Combustor	2.20	1.10	0.05	<0.01	0.81	0.06
Fugitive Emissions	0.00	0.00	0.00	0.00	1.02	0.09
Flowback Flares[(2)]	13.23	2.43	0.23	0.02	13.80	13.64
Truck Loading[(3)]	0.00	0.00	0.00	0.00	13.17	1.16
Facility-Wide Totals →	**15.89**	**4.08**	**0.32**	**0.04**	**28.83**	**14.96**

(1) All particulate matter emissions are assumed to be less than 2.5 microns. Includes condensables.
(2) Aggregate emission rate of all such units.
(3) Only includes uncaptured fugitive emissions and not those sent to vapor combustor for control.

Table 3: Facility-Wide Aggregate Annual (ton/yr) Criteria Pollutant/GHG PTE Summary.

Source	CO	NO_x	PM[(1)]	SO_2	VOCs	HAPs	CO_2e
Process Heaters/Pilot Lights[(2)]	2.01	2.39	0.18	0.01	0.13	0.05	2,998.37
Vapor Combustor	9.65	4.64	0.22	<0.01	3.55	0.31	4,099.81
Fugitive Emissions	0.00	0.00	0.00	0.00	4.49	0.40	132.26
Flowback Flares[(2)]	13.34	2.45	0.23	0.02	13.91	13.74	4,601.26
Truck Loading[(3)]	0.00	0.00	0.00	0.00	2.01	0.18	0.60
Facility-Wide Totals →	**25.00**	**9.48**	**0.63**	**0.04**	**24.09**	**14.68**	**11,832.30**

(1) All particulate matter emissions are assumed to be less than 2.5 microns. Includes condensables.
(2) Aggregate emission rate of all such units.
(3) Only includes uncaptured fugitive emissions and not those sent to vapor combustor for control.

Table 4: Facility-Wide Aggregate Annual (ton/yr) HAP PTE Summary[(1)]

Source	Hexane	Benzene	Toluene	Ethyl-benzene	Xylene	Formal dehyde	Total HAPs
Process Heaters/Pilot Lights[2]	0.06	~0.00	~0.00	~0.00	~0.00	~0.00	0.06
Vapor Combustor	0.19	0.02	0.02	0.02	0.06	0.00	0.31
Fugitive Emissions	0.25	~0.00	0.03	0.03	0.09	0.00	0.40
Flowback Flares[2]	13.75[3]	0.00	0.00	0.00	0.00	0.00	13.75
Truck Loading[4]	0.11	~0.00	0.01	0.01	0.04	~0.00	0.17
Facility-Wide Totals →	**14.36**	**0.02**	**0.06**	**0.06**	**0.19**	**0.00**	**14.69**

(1) As the PTE of all individual HAPs is less than 10 TPY and the PTE of total HAPs is less than 25 TPY, the proposed Hoyt 401 natural gas production facility is defined as a minor source of HAPs for purposes of 40 CFR 61, 40CFR63, and Title V.
(2) Aggregate emission rate of all such units.
(3) Includes 2-Methylpentane and 3-Methylpentane.
(4) Only includes uncaptured fugitive emissions and not those sent to vapor combustor for control.

REGULATORY APPLICABILITY

The proposed HG Energy natural gas production facility is subject to substantive requirements in the following state and federal air quality rules and regulations: 45CSR6, 45CSR13, and 40 CFR 60 Subpart OOOO. Each applicable rule (and those that have reasoned non-applicability), and HG Energy's compliance therewith, will be discussed in detail below.

45CSR6: To Prevent and Control Particulate Air Pollution from Combustion of Refuse

HG Energy has proposed flaring for combusting the natural gas produced from wells during flowback. The flares meet the definition of an "incinerator" under 45CSR6 and are, therefore, subject to the requirements therein. The substantive requirements applicable to the flare are discussed below.

45CSR6 Emission Standards for Incinerators - Section 4.1

Section 4.1 limits PM emissions from incinerators to a value determined by the following formula:

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

The proposed flares will be required to meet the requirements of 40 CFR 60, Subpart A, Sections 60.18(b) through (f). This section requires they flare operate with "no visible emissions

as . . . except for periods not to exceed a total of 5 minutes during any 2 consecutive hours." Therefore, the potential particulate matter emissions from the flares will be nominal.

However, for a conservative estimate, HG Energy calculated potential particulate matter emissions from the flare based on an emission factor taken from AP-42, Section 1.4. The total hourly particulate matter emission rate from both flares is 0.23 lbs/hr. Based conservatively on the density of methane (0.042265 lb/scf) and the average aggregate maximum hourly flaring rate of 29,800 scf/hr, the the aggregate capacity of the flares are approximately 1,260 lbs/hr (0.63 tons/hr). Based on the above, the aggregate particulate matter limit of the flares is 3.42 lbs/hr. As the total hourly particulate matter emission rate from both flares is 0.23 lbs/hr, the flares are in compliance with this emission limit.

45CSR6 Opacity Limits for - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, the flare has a 20% limit on opacity during operation. The proposed flares will be required to meet the requirements of 40 CFR 60, Subpart A, Sections 60.18(b) through (f). This section requires the flare operate with "no visible emissions as . . . except for periods not to exceed a total of 5 minutes during any 2 consecutive hours." Therefore, compliance with this requirement will show compliance with the 45CSR6 opacity requirement.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The proposed construction of a natural gas production facility at the existing Hoyt 401 well-pad has a potential to emit a regulated pollutant in excess of six (6) lbs/hour and ten (10) TPY and, therefore, pursuant to §45-13-2.24, the construction is defined as a "stationary source" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, HG Energy was required to obtain a permit under 45CSR13 for the construction and operation of the natural gas production facility.

As required under §45-13-8.3 ("Notice Level A"), HG Energy placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on October 3, 2012 in *The Wetzel Chronicle* and the affidavit of publication for this legal advertisement was submitted on October 9, 2012.

45CSR14 (NON APPLICABILITY)

The facility-wide potential-to-emit of the Hoyt 401 natural gas production facility (see Table 3 above) is below the levels that would define the source as "major" under 45CSR14 and, therefore, the construction evaluated herein is not subject to the provisions of 45CSR14.

Potential Source Aggregation

Classifying multiple facilities as one "stationary source" under 45CSR13, 45CSR14, and

45CSR19 is based on the definition of "Building, structure, facility, or installation" as given in §45-14-2.13 and §45-19-2.12. The definition states:

> "Building, Structure, Facility, or Installation" means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).

The proposed Hoyt 401 natural gas production facility will be located approximately 0.64 and 0.79 miles from the proposed John Rush 404 (R13-2985) and Hoyt 402 (R13-2966) facilities. Both proposed facilities share the same SIC code as Hoyt 401 and are owned by HG Energy. Therefore, the potential classification of the Hoyt 401 facility as one stationary source with either Hoyt 401, Hoyt 402, or both depends on the determination if these stations are considered "contiguous or adjacent properties."

"Contiguous or Adjacent" determinations are made on a case by case basis. These determinations are proximity-based, and it is important to focus on this and whether or not it meets the common sense notion of one stationary source. The terms "contiguous" or "adjacent" are not defined by USEPA. Contiguous has a dictionary definition of being in actual contact; *touching along a boundary or at a point*. Adjacent has a dictionary definition of not distant; nearby; *having a common endpoint or border*.

The proposed Hoyt 401 natural gas production facility is not located contiguous with, or *directly* adjacent to the proposed John Rush 404 or Hoyt 402 facilities. As noted above, the facilities are each over a 0.60 miles from the proposed site of Hoyt 401 facility. Facilities separated by these distances do not meet the common sense notion of a single plant. Therefore, the proposed facilities in question are not considered to be on contiguous or adjacent property.

45CSR17: To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

45CSR17 requires facilities to "prevent and control particulate matter air pollution from materials handling, preparation, storage and other sources of fugitive particulate matter." Specifically, §45-17-3.2b requires "[a]pplication of . . . water or suitable chemicals on unpaved roads. . . and other surfaces which can create airborne particulate matter." To meet this requirement, the draft permit, pursuant to 4.1.11 , requires HG Energy to maintain all paved roads/work areas and use a water truck on all unpaved roads/work areas when necessary.

45CSR30: Requirements for Operating Permits - (NON APPLICABILITY)

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The proposed facility does not meet the definition of a "major source under § 112 of the Clean Air Act" as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. However, as the facility is subject to a New Source Performance Standard (NSPS) - 40 CFR 60, Subpart OOOO - the facility would, in most cases, be subject to Title V as a "deferred source." However, pursuant to §60.5370(c), as a non-major "area source," HG Energy is not required to obtain a Title V permit for the proposed

facility. Therefore, the Hoyt 401 natural gas production facility is not subject to 45CSR30.

40 CFR 60, Subpart OOOO: Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution

On April 27, 2012 the USEPA issued a final rule (published in the Federal Register on August 16, 2012) that consists of federal air standards for natural gas wells that are hydraulically fractured, along with requirements for several other sources of pollution in the oil and gas industry that currently are not regulated at the federal level. Pursuant to §60.5365(a) each "gas well affected facility, which is a single natural gas well" that is constructed after August 23, 2011 is subject to the applicable provisions of Subpart OOOO as well as "[e]ach storage vessel affected facility, which is a single storage vessel, located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment."

Gas Wells - §60.5370

HG Energy has drilled six gas wells at the Hoyt 401 well-pad and, therefore, these are defined as "affected facilities" under Subpart OOOO and subject to applicable provisions. The substantive requirements for gas wells drilled prior to January 1, 2015 are given under §60.5375(a)(3) of the rule. It requires that flowback emissions (gas produced from the well after fracturing) must be "directed to the flow line or a completion combustion device." A flare does meet the definition of a "completion combustion device." Therefore, HG Energy's proposed use of flares to combust the gas produced from the wells meets the substantive requirement of Subpart OOOO. Other requirements pertaining to the gas well include:

- HG Energy must maintain a log for each well completion operation at each gas well affected facility. The log must be completed on a daily basis for the duration of the well completion operation and must contain the records specified in §60.5420(c)(1)(iii).
  [40CFR§60.5375(b)]

- HG Energy must demonstrate initial compliance with the standards that apply to gas well affected facilities as required by §60.5410.
  [40CFR§60.5375(c)]

- HG Energy must demonstrate continuous compliance with the standards that apply to gas well affected facilities as required by §60.5415.
  [40CFR§60.5375(d)]

- HG Energy must perform the required notification, recordkeeping and reporting as required by §60.5420.
  [40CFR§60.5375(e)]

Storage Tanks - §60.5395

Under §60.5395, the requirements for storage tanks take effect on October 15, 2013. However, as the site is expected to be in production at that time, the storage tank requirements will be reviewed. The substantive requirement for storage tanks is given under §60.5395(a) of the rule. It

requires that for each storage vessel "emitting more than 6 tpy VOC, [the permittee] must reduce VOC emissions by 95.0 percent of greater. . ."

The five (5) condensate tanks are each calculated to have the potential to emit more than 6 TPY of VOCs and, therefore, as of October 15, 2013, shall be subject to the requirement to reduce VOC emissions by 95%. HG Energy has proposed to meet this requirement through the use of a vapor combustor on all working/breathing/flashing emissions emitted from the tanks with a minimum organics combustion efficiency of 98.0%. HG Energy must additionally meet the requirements relating to the use of a vapor combustion device under §60.5411(a), (b), and §60.5412.

Additionally, HG Energy must meet the compliance, notification, recordkeeping, and reporting requirements relating to applicable storage tanks as given under §60.5410, §60.5415, and §60.5420.

Pneumatic Controllers

Pursuant to §60.5365(d)(2), "[f]or the natural gas production segment (between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not including natural gas processing plants), each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh" that is constructed after August 23, 2011 is subject to the applicable provisions of Subpart OOOO. The substantive requirements for pneumatic controllers are given under §60.5390. While not identified, it is assumed the facility will use pneumatic controllers and will be required to meet this requirement.

TOXICITY ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the Hoyt 401 natural gas production facility and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) standards promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. HG Energy included the following HAPs in their emissions estimate: Benzene, Ethylbenzene, Formaldehyde, n-Hexane, Toluene, and Xylenes. The following table lists

each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 5: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
n-Hexane	VOC	No	Inadequate Data
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Toluene	VOC	No	Inadequate Data
Ethylbenzene	VOC	No	Category D - Not Classifiable
Xylenes	VOC	No	Inadequate Data
Formaldehyde	VOC	Yes	B1 - Probable Human Carcinogen

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health affects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

AIR QUALITY IMPACT ANALYSIS

The estimated maximum emissions from the proposed Hoyt 401 natural gas production facility are less than applicability thresholds that would define the proposed facility as a "major stationary source" under 45CSR14 and, therefore, no air quality impacts modeling analysis was required. Additionally, based on the nature of the proposed construction, modeling was not required under 45CSR13, Section 7.

MONITORING, COMPLIANCE DEMONSTRATIONS, REPORTING, AND RECORDING OF OPERATIONS

The following substantive monitoring, compliance demonstration, and record-keeping requirements (MRR) shall be required:

- For the purposes of demonstrating compliance with maximum gas combustion limitations set forth in 4.1.3(b), HG Energy shall be required to monitor and record the daily, monthly, and rolling twelve month total of gas combusted (in scf) by the flares.

- HG Energy shall be required to maintain records of all startups, shutdowns, and/or malfunctions of each flare and the vapor combustor. These records shall include the date, time,

and duration of each event.

- HG Energy shall be required to maintain records of the date, time, and duration each time the permittee does not detect the presence of a flare pilot flame in either flare or the vapor combustor.

- For the purposes of demonstrating compliance with visible emissions limitations set forth in 4.1.3(e)(1) and 4.1.10(c), HG Energy shall be required to:

    a. Conduct an initial Method 22 visual emission observation on both flares and the vapor combustor to determine the compliance with the visible emission provisions. HG Energy shall be required to take a minimum of two (2) hours of visual emissions observations on both flares.

    b. Conduct daily (monthly for the vapor combustor) Method 22 visible emission observations of both flares and the vapor combustor to ensure proper operation for a minimum of ten (10) minutes each day the flares and the vapor combustor are in operation.

    c. In the event visible emissions are observed in excess of the limitations given under 4.1.3(g) and 4.1.10(c), the permittee shall take immediate corrective action.

- For the purposes of demonstrating compliance with maximum limit for the aggregate production of condensate/liquids from the wells set forth in 4.1.6, HG Energy shall be required to monitor and record the daily, monthly, and rolling twelve month total of condensate/liquids (in gallons) produced in the wells.

- HG Energy shall be required to maintain records of all visual emission observations pursuant to the testing required under 4.2.5. including any corrective action taken.

- If HG Energy observes any visible emissions from the flare pursuant to the testing requirements given under 4.2.4., HG Energy shall be required to notify DAQ within twenty-four (24) hours.

- HG Energy shall be required to meet all applicable Monitoring, Compliance Demonstration and Source-Specific Recordkeeping Requirements as given under 40 CFR 60, Subpart OOOO.

PERFORMANCE TESTING OF OPERATIONS

The following substantive performance testing requirements shall be required:

- Within sixty (60) days of production of natural gas in any well at the Hoyt 401 natural gas production facility, in accordance with the provisions of 3.3 of this permit, HG Energy shall be required to perform or have performed an analysis to determine the constituent properties of the condensate/produced liquids. The analysis shall, at a minimum, include the same components as the analysis submitted in Permit Application R13-2992. Where applicable, if

the analysis shows average constituent properties that, when used to calculate emissions in the same manner as submitted in Permit Application R13-2992, result in emissions that are emissions 10% greater than those used in the permit application, the permittee shall, within thirty (30) days of receiving the results of the analysis, submit to the Director an appropriate permit application to increase emissions.

- HG Energy shall be required to meet all applicable Testing Requirements as given under 40 CFR 60, Subpart OOOO.

RECOMMENDATION TO DIRECTOR

The information provided in permit application R13-2992 indicates that compliance with all applicable regulations will be achieved. Therefore, I recommend to the Director the issuance of Permit Number R13-2992 to HG Energy, LLC for the construction of a natural gas production facility at the existing Hoyt 401 well-pad located near Wileyville, Wetzel County, WV.

Joseph Kessler, PE
Engineer

Date