



DEPARTMENT OF
ECOLOGY
State of Washington

STATEMENT OF BASIS
FOR
DRAFT AIR OPERATING PERMIT NO. 18AQ-C221
PUBLIC UTILITY DISTRICT NO. 1 OF KLICKITAT COUNTY'S
H.W. HILL LANDFILL GAS POWER PLANT
KLICKITAT COUNTY, WASHINGTON

PREPARED BY:
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1.0 LIST OF ABBREVIATIONS

AFS	Air Facility System
AOP	Air Operating Permit
BACT	best available control technology
CAM	compliance assurance monitoring
CEMS	continuous emissions monitoring system
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
°F	degrees Fahrenheit
FCE	full compliance evaluation
FRV	Federally Reportable Violation
GHG	greenhouse gas
H ₂ S	hydrogen sulfide
hr/yr	hours per year
HRSG	heat recovery steam generator
IC	internal combustion
KPUD	Public Utility District No. 1 of Klickitat County
Landfill	Roosevelt Regional Landfill
LFG	landfill gas
MRR	monitoring, recordkeeping, and reporting
MT	metric tons
MW	megawatt
N ₂ O	nitrous oxide
NAAQS	national ambient air quality standards
NESHAP	national emissions standard for hazardous air pollutants
NMOC	non methane organic compound
NOC	Notice of Construction
NOV	Notice of Violation
NO _x	oxides of nitrogen
NSPS	new source performance standard
PC	pre-chamber
PM _{2.5}	particulate matter with an aerodynamic diameter of 2.5 micrometers or less
PM ₁₀	particulate matter with an aerodynamic diameter of 10 micrometers or less
Plant	H.W. Hill Landfill Gas Power Plant
PSD	prevention of significant deterioration
psig	pounds per square inch gage (above ambient pressure)
RCW	Revised Code of Washington
RDC	Regional Disposal Company
RNG	renewable natural gas
S	state-only enforceable
scf	standard cubic feet
SO ₂	sulfur dioxide
tpy	tons per year
VOC	volatile organic compound
WAC	Washington Administrative Code
%	percent

2.0 GENERAL INFORMATION

Company Name: Public Utility District No. 1 of Klickitat County

Source Name: H.W. Hill Landfill Gas Power Plant

Owner: Public Utility District No. 1 of Klickitat County

Unified Business Identification Number: 202-000-284

Standard Industrial Classification Code: 4911 (electrical power generation, transmission, or distribution)

Mailing Address: 1313 South Columbus Avenue
Goldendale, WA 98620

Source Address: 502 Roosevelt Grade Road
Roosevelt, WA 99356

Responsible Officials: Jim Smith
General Manager
Public Utility District No. 1 of Klickitat County
1313 South Columbus Avenue
Goldendale, WA 98620
Phone: 509-773-7617
Fax: 509-773-4969
Email: jsmith@klickpud.com

Alternate Responsible Official & Site Contact: Kevin Ricks
Generation Asset & Special Projects Manager
Public Utility District No. 1 of Klickitat County
1313 South Columbus Avenue
Goldendale, WA 98620
Phone: 509-773-7430
Email: kricks@klickpud.com

Basis for Title V Applicability:

KPUD is subject to Title V, Air Operating Permit (AOP) Regulation, by virtue of the potential-to-emit greater than 100 tons per year of carbon monoxide, oxides of nitrogen, and volatile organic compounds, and 100,000 tons per year of CO₂ equivalent emissions.

Attainment Classification:

KPUD is located in an area that is unclassified for all criteria pollutants.

Timeline:

See also section 6.0 (below).

March 23, 2015 – Ecology received renewal Title V Air Operating Permit application.

May 21, 2015 – Application deemed incomplete.

July 20, 2015 – Additional application information received

August 4, 2015 – Application deemed complete

April 2018 – Ecology issued Draft Title V Air Operating Permit etc....

3.0 BACKGROUND

3.1 Introduction

This document sets forth the legal and factual basis for the permit conditions in a Title V AOP issued by the State of Washington Department of Ecology for a power generation facility, operated by Public Utility District No. 1 of Klickitat County (KPUD) and located near Roosevelt, Washington. This document is called a “statement of basis” and is required by Washington State regulations [Chapter 173-401 WAC]. A statement of basis does not contain enforceable permit conditions. Enforceable permit conditions are contained in the AOP itself.

4.0 SOURCE DESCRIPTION

4.1 Physical Description

H.W. Hill Landfill Gas Power Plant is a landfill-gas-to-energy facility built on land leased from Republic Services Incorporated. The source incorporates two distinct activities: the power plant consists of two combustion turbines and two heat recovery steam generators with an electrical generation capacity of up to 28.2 MW; and the other is a renewable natural gas plant. The source is located within the Roosevelt Regional Landfill property boundary in the Northeast quarter of Section 27, Township 4 North, Range 21 East, Willamette Meridian, approximately five miles North of Roosevelt in Klickitat County. Access to the site is via the Landfill’s haul road. The plants are both located approximately one mile east of the landfill operations building, and half a mile from each other. Figures 1-3 provide facility site maps.

4.2 Description of Processes

A process flow diagrams details the Plant’s in Figure 4 & 5. Raw landfill gas is delivered to the Plant from Roosevelt Regional Landfill’s blower/flare facility via an above-ground pipeline. There is a low-point condensate drain near the Landfill’s facility. Total pipeline distance is about 720 feet. All condensates collected at the drain and at other points in the fuel system are piped to the Landfill’s leachate collection pond. Raw landfill gas is processed in the landfill gas treatment system, prior to routing to either the power plant or the RNG plant.

4.2.1 Power Plant

Clean, dry landfill gas fuel entering the power plant is directed through an inlet scrubber vessel to remove moisture and then directed through a high pressure compressor system comprised of two screw type compressors where the gas pressure is increased from approximately 65 psig to approximately 450 psig. The pressurized landfill gas then enters an oil separator vessel to remove hydrocarbon liquids before passing through a set of fin-fan aftercoolers. Clean, pressurized gas may also be recirculated back to the compressors to allow adequate pre-heating of compressed gas. The cooled, compressed landfill gas then enters two 10.1 MW (nominal) combustion turbine generators. Power is generated at 13,800 volts and sent to the generator step-up transformer where it is converted to 115,000 volts power for transmission to the grid.

To increase efficiency, each turbine has a heat recovery steam generator (HRSG) which produces high pressure steam at 600 psig (nominal) that is sent to a shared 6 MW steam turbine. Each HRSG may be bypassed if necessary, with the corresponding turbine exhaust stream sent to separate bypass stacks. Each of the four stacks (two main, two HRSG bypass) is monitored for CO, O₂ and NO_x by a continuous emissions monitoring system (CEMS).

During normal operations, power generation will occur 24 hours per day, seven days per week, 365 days a year (8,760 hr/yr). However, the turbines do require periodic maintenance shutdowns, and the utility system typically experiences several outages per year, resulting in less than 8,760 hours of typical operation per turbine.

4.2.2 Renewable Natural Gas Plant

The renewable natural gas plan (RNG) may be operated instead of the power plant; only one plant may be operated at any one time. The RNG plant uses a “Selexol” process, which utilizes a solvent mixture of dimethyl ethers and polyethylene glycol for carbon dioxide removal. Two thermal oxidizers control volatile organic compounds venting from the selexol process. Additionally, a catalytic process removes oxygen, an amine scrubber system removes additional CO₂, a cryogenic process removes nitrogen, screw compressors bring the gas to pipeline pressure, and a candlestick flare is used for startup and emergency gas venting. The resulting renewable natural gas is injected into the nearby Williams’ Northwest natural gas pipeline, for market transport.

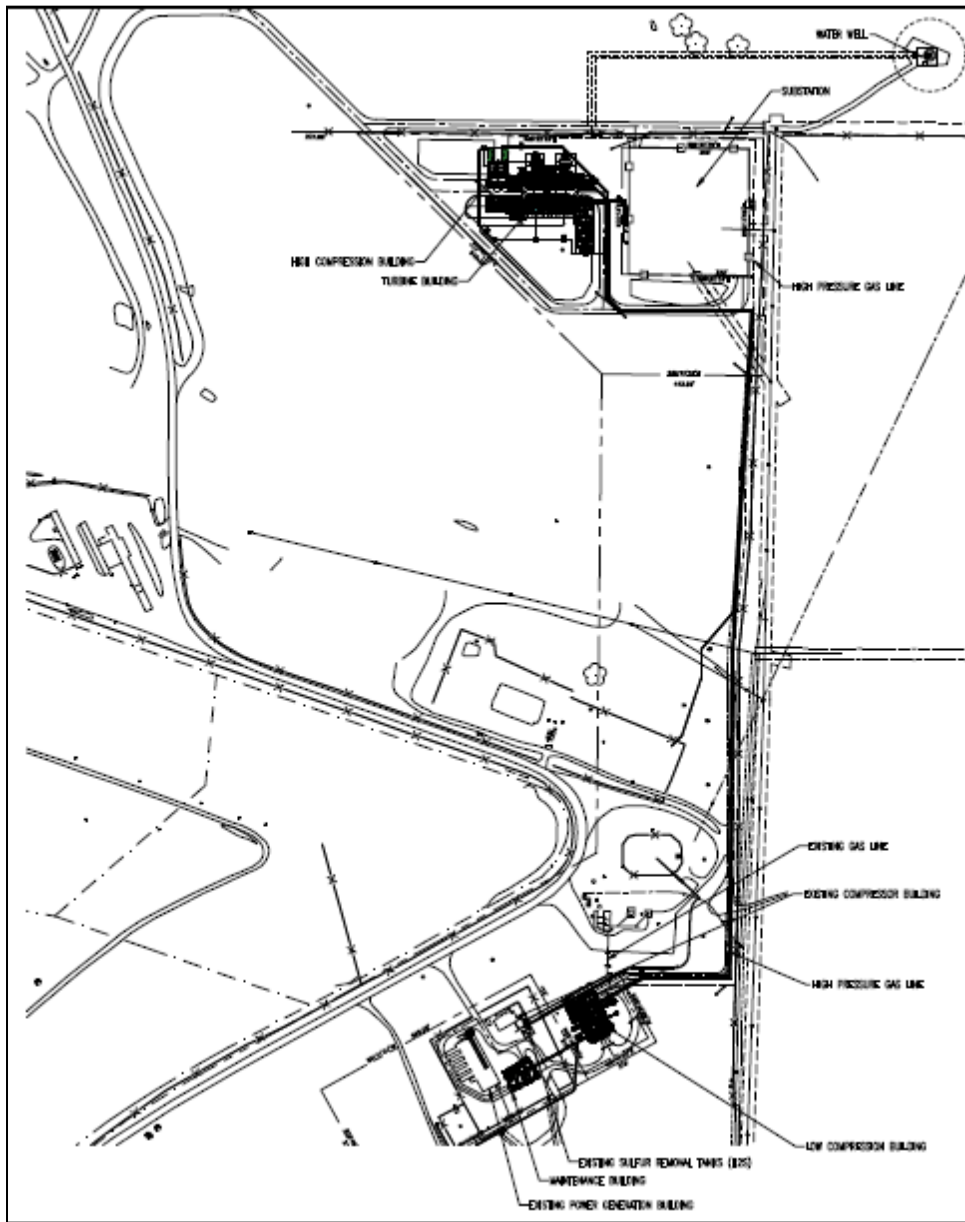


Figure 1: Site map of H.W. Hill Landfill Gas Power Plant, including the lower and upper facilities (adapted from 2/5/10 AOP renewal application, submitted by Public Utility District No. 1 of Klickitat County).

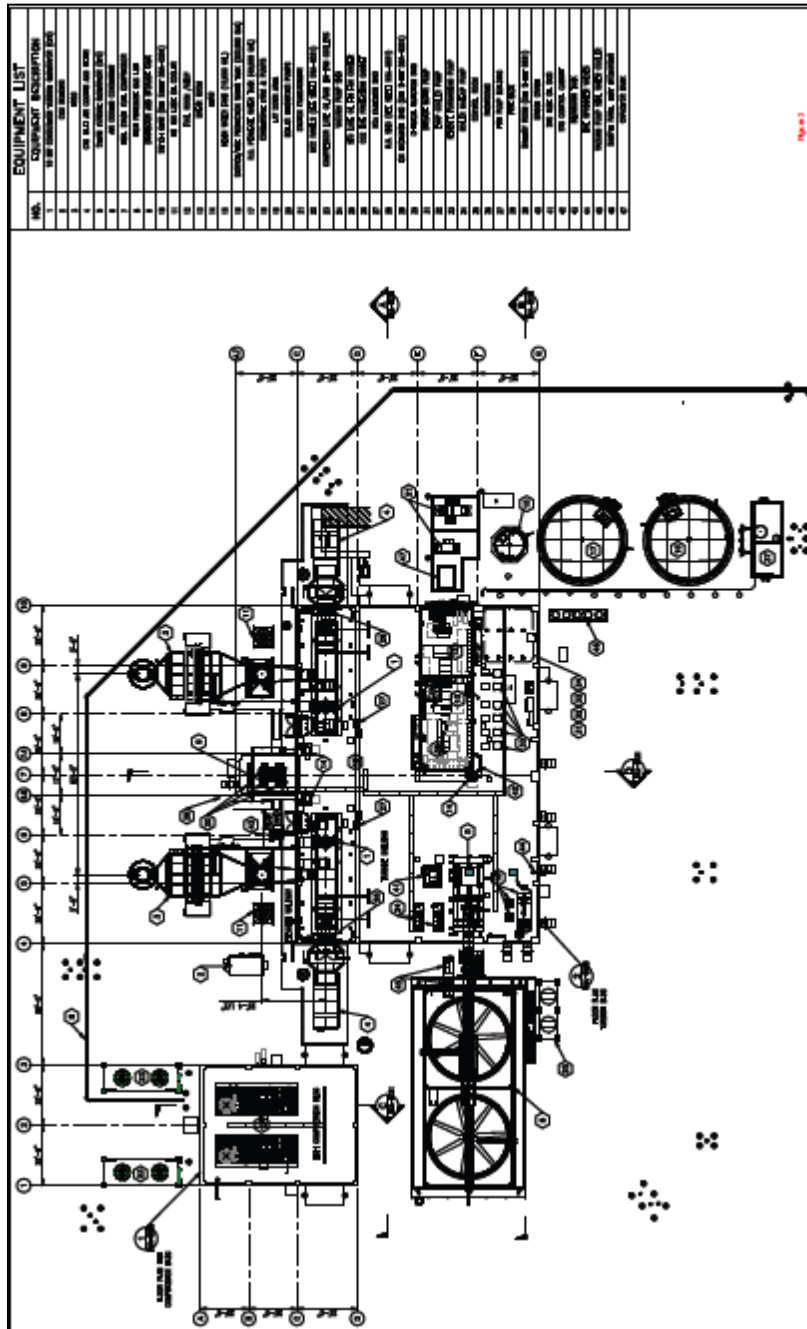


Figure 2: Site map of H.W. Hill Landfill Gas Power Plant's combustion turbine facility (adapted from 2/5/10 AOP renewal application, submitted by Public Utility District No. 1 of Klickitat County).

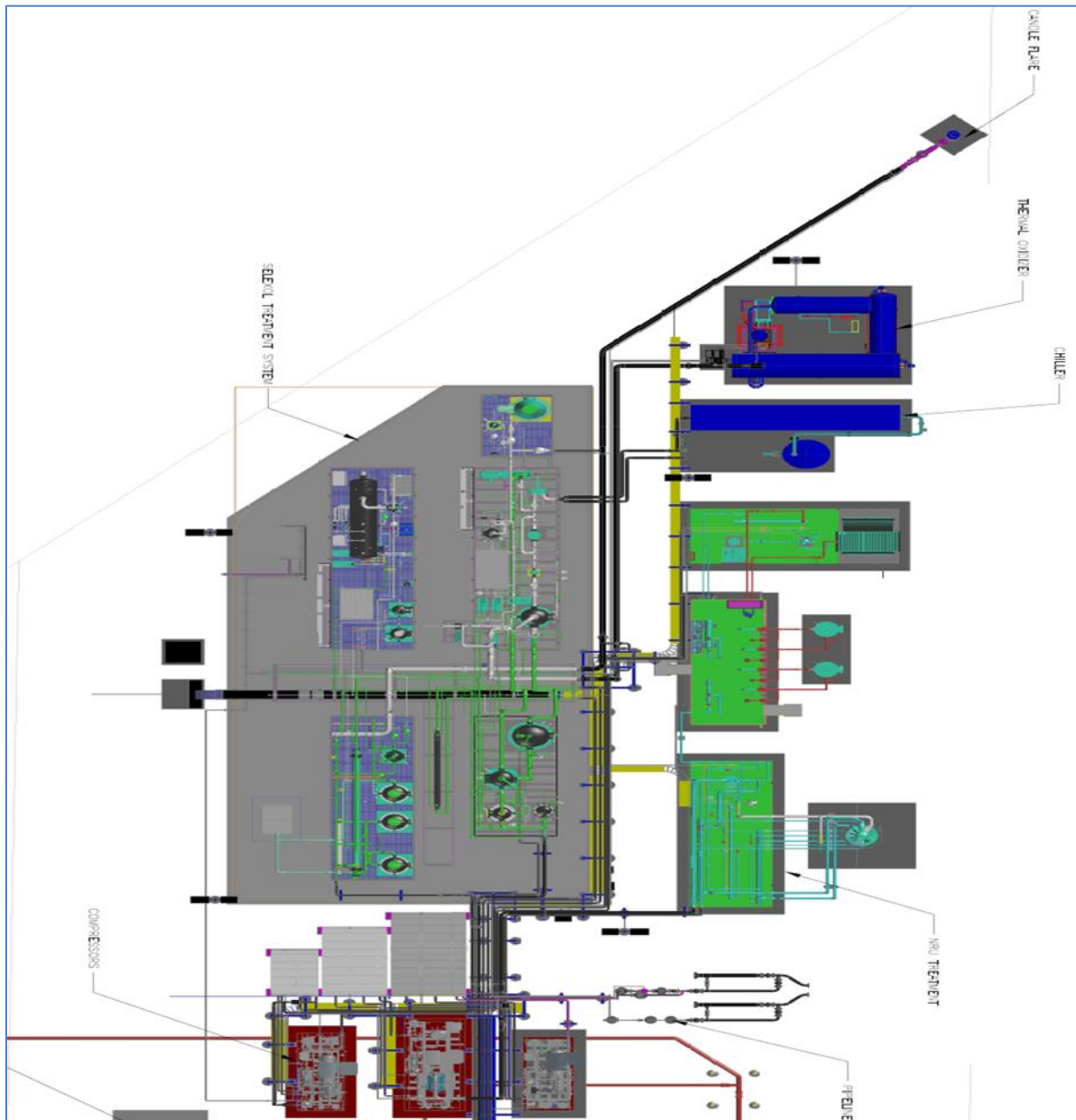


Figure 3: Site map of the Renewable Natural Gas facility (submitted by Public Utility District No. 1 of Klickitat County, on 4/6/18).

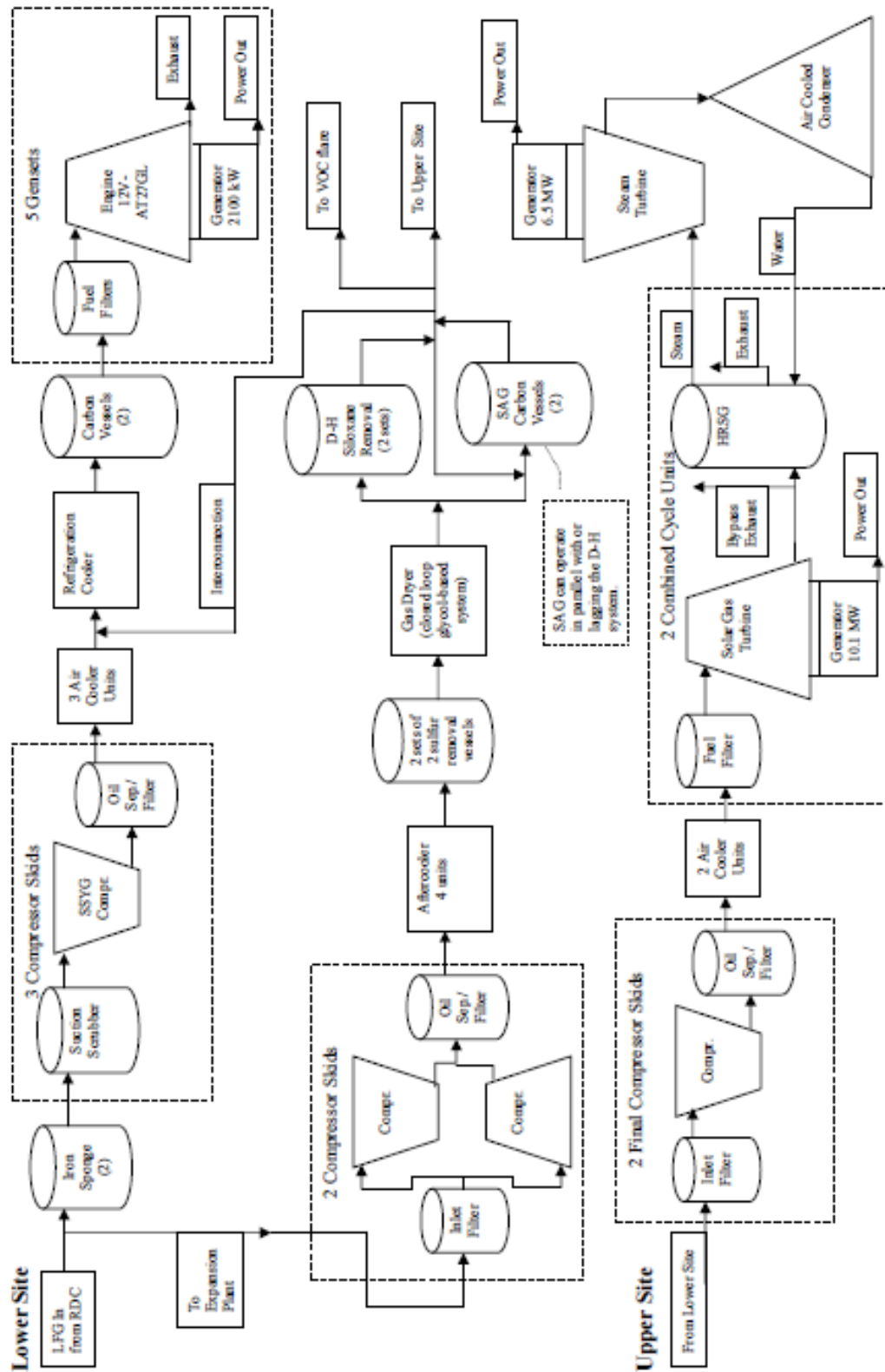


Figure 4: H.W. Hill Landfill Gas Power Plant process flow diagram (adapted from 2/5/10 AOP renewal application, submitted by Public Utility District No. 1 of Klickitat County).

Table 1: Summary of estimated maximum potential air emissions (potential-to-emit).

Pollutant	Emissions				
	Gas Cleaning Plant w/ Enclosed Flare	Power Plant w/ Combustion Turbines	RNG Plant w/ Candlestick Flare	Total PTE	
Nitrogen Oxides (NO _x)	1.40	247.6	8.5	249.0	ton/yr
Carbon Monoxide (CO)	0.88	136.7	30.5	137.6	ton/yr
Volatile Organic Compounds (VOCs)	5.96	125.9	3.4	131.9	ton/yr
Particulate Matter (PM _{2.5}) ¹	0.65	47.4	14.3	48.1	ton/yr
Particulate Matter (PM ₁₀) ²	0.53	39.2	14.3	39.7	ton/yr
Sulfur Dioxide (SO ₂)	0.33	13.1	2.3	13.4	ton/yr
1,1,1-Trichloroethane (Methyl Chloroform)	0.35	42.0	0.00	42.4	lb/yr
1,1,2,2-Tetrachloroethane	1.02		0.00	1.02	lb/yr
1,1-Dichloroethane	1.27		0.00	1.27	lb/yr
1,1-Dichloroethene	0.11		0.00	0.11	lb/yr
1,2-Dichloroethane	0.22		0.281	0.50	lb/yr
1,2-Dichloropropane	0.11		0.00	0.11	lb/yr
1,3-Butadiene			0.0191	0.02	lb/yr
4-Ethyltoluene			0.384	0.38	lb/yr
Acetone		2.10	16.5	18.6	lb/yr
Acrylonitrile	0.46	18.0	0.00	18.5	lb/yr
Benzene	1.18	1482.6	1.95	1,483.8	lb/yr
Benzyl Chloride		18.0		18.0	lb/yr
Bromodichloromethane	2.80			2.80	lb/yr
Carbon Disulfide	0.060			0.06	lb/yr
Carbon Tetrachloride	0.0034	2.72		2.72	lb/yr
Chlorobenzene	0.15			0.15	lb/yr
Chlorodifluoromethane	0.61	3403		3404	lb/yr
Chloroethane	0.44		0.0474	0.49	lb/yr
Chloroform	0.02	10.4		10.4	lb/yr
Chloromethane (Methyl Chloride)	0.33	2.10	0.00611	2.43	lb/yr
Cumene			0.482	0.482	lb/yr
Cyclohexane		188	4.13	188	lb/yr
Dichlorobenzene	0.17			0.17	lb/yr
Dichloromethane	6.63		0.3	6.9	lb/yr
Ethylbenzene	0.67	2.89	6.66	7.33	lb/yr
Ethylene Dibromide	0.0011			0.0011	lb/yr
Formaldehyde		674		674	lb/yr
Heptane		375		375	lb/yr
Hexane	0.77		1.37	2.14	lb/yr
Hydrogen Sulfide	1.65	265	0.012	267	lb/yr
Isopropyl Alcohol (2-Propanol)	4.11		23.9	28.0	lb/yr
Mercury (Total)	0.0001			0.0001	lb/yr

Pollutant	Emissions				
	Gas Cleaning Plant w/ Enclosed Flare	Power Plant w/ Combustion Turbines	RNG Plant w/ Candlestick Flare	Total PTE	
Methyl Ethyl Ketone (2-Butanone)	0.70	2.19	22.1	22.8	lb/yr
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.26	0.175	2.41	2.67	lb/yr
Propene			16.7	16.7	lb/yr
Styrene		0.175	0.368	0.368	lb/yr
Tetrachloroethene (Perchloroethylene)	3.38	0.263	0.548	3.93	lb/yr
Tetrahydrofuran		872		872	lb/yr
Toluene	20.74	2.89	1.89	23.6	lb/yr
Trichloroethylene	2.02		2.39	4.41	lb/yr
Vinyl Acetate		0.175		0.175	lb/yr
Vinyl Chloride	2.50	0.263	0.342	2.84	lb/yr
Xylenes	1.75	16.7	15.3	18.5	lb/yr

Facility-Wide Sources

Facility-wide sources include facility-wide emissions, such as fugitive dust from motor vehicle operation, and emissions related to plant-wide support services such as the landfill fuel delivery system, condensate drain system, lubricating oil storage tanks, and other maintenance, housekeeping, and miscellaneous, insignificant emissions activities. Minor welding operations are performed on-site. There are fugitive emissions from the landfill gas treatment systems during media change outs and from online sensor vents. Facility-wide source emission limits, work practice standards and permit conditions also apply to all significant emission units located at the source. Table 1 lists the source’s estimated potential emissions.

Process #1, Fire Pump

Process #1 consists of a 149 horsepower diesel fire pump, installed in approximately 2010.

Process #2, Emergency Generators

Process #2 consists of two small – approximately 40 horsepower – propane fired rich burn, spark ignited emergency generators, installed in approximately 2010.

Process #3, Combustion Turbine Power Generation Plant

Process #3 is production of electrical energy by burning landfill gas (approximately 55% methane, 45% carbon dioxide, and various other trace gases) within two combustion turbines, each paired with a heat recovery steam generator (HRSG). Each combustion turbine is an emission unit, where the exhaust gasses from each turbine will pass through a HRSG before they are vented from a primary stack. The turbines and HRSGs each turn an alternating current generator synchronized to the utility transmission system. Occasionally, when the HRSG units are not operating, the exhaust gasses will be vented from by-pass stacks.

Process #4, Enclosed Flare – Gas Treatment Plant

Process #4 consists of an enclosed flare, associated with the landfill gas treatment system. All landfill gas is routed through the landfill gas treatment system prior to use in either the power plant for the RNG plant. The landfill gas treatment system is designed to remove H₂S, siloxanes, and other contaminants from the landfill gas and condition the gas. In the first stage of the system sulfur removal is accomplished using a solid media (iron sponge, sulfatreat etc.) or a liquid redox system. There are two stages of siloxane removal that occur. The first is a regenerable silica-alumina based media, and the second is a non-regenerable carbon based media. The design capacity of the landfill gas treatment system is 8,000 cubic feet per minute at site average conditions. The gas cleaning plant includes an enclosed waste gas flare capable of combusting up to 12,000 cubic feet of gas per hour, from the siloxane process,

during periods when the system is purged for media regeneration. The treated gas is then routed to either the power plant or the RNG plant.

Process #5, Renewable Natural Gas Plant

Process #5 is the renewable natural gas plant. The RNG plant will use a “Selexol” process, which utilizes a solvent mixture of dimethyl ethers and polyethylene glycol for CO₂ removal. Two thermal oxidizers control VOCs venting from the Selexol process. Additionally, a catalytic process removes oxygen, an amine scrubber system removes additional CO₂, a cryogenic process removes nitrogen, screw compressors bring the gas to pipeline pressure, and a candlestick flare is available for startup and emergency gas venting. The resulting RNG is injected into a nearby natural gas pipeline for market transport.

5.0 NEW SOURCE REVIEW HISTORY

In Washington State, new sources of air pollution are potentially subject to several types of new source review (air quality permitting). Federal new source review includes Prevention of Significant Deterioration (Title 40 Code of Federal Regulations Part 52.21) and Nonattainment New Source Review (Title 40 Code of Federal Regulations Part 52.24). The Federal programs apply to large sources with potential emissions equal or greater than specified thresholds. State new source review, referred to as Notice of Construction (NOC) permitting, applies to smaller sources, and the lesser emissions at the larger sources. Notice of Construction permitting may be required for criteria pollutants (WAC 173-400-110) and/or toxic air pollutants (WAC 173-460-040). In addition to traditional authorization by State new source review, replacement or substantial alteration of emission control technology at an existing stationary source, or a general order of approval for a specific type of emission unit or source, may be authorized according to WAC 173-400-116 or WAC 173-400-560 respectively.

5.1 Power Generation – IC Engines.

Ecology originally authorized the installation and operation of five internal combustion (IC) engines using landfill gas as fuel to generate up to 10.5 megawatts of electrical power, through Notice of Construction Approval Order No. DE 98AQ-C174, issued December 1, 1998. Initially, four IC engines were constructed. The first engine commenced operation on April 15, 1999, the first kilowatt-hour was generated on April 23, 1999, and commercial power sales began on June 1, 1999. The fifth IC engine commenced operation in June, 2000.

On February 10, 2005, KPUD submitted a Notice of Construction application for the modification of the landfill gas cleaning system at their existing H.W. Hill Landfill Gas Power Plant. KPUD asked for flexibility in implementing the system, due to uncertainty in the system’s actual performance. The application was processed as an emission control technology order, per WAC 173-400-114, and approved the system modification, including the addition of iron sponge media and granular carbon beds, designed to clean the landfill gas prior to combustion in the five internal combustion IC engines. Ecology approved the modified treatment system through issuance of Order No. 05AQ-C014, on March 11, 2005. The landfill gas cleaning system became operational on August 29, 2005.

The IC engines were last operated on March 22, 2012. Authorization to operate the IC Engines, and the associated landfill gas cleaning system, was rescinded, on June 12, 2017, upon issuance of Order No. 17AQ-C220.

5.2 Power Generation – Turbines, Landfill Gas Treatment System, and Enclosed Flare.

Ecology originally authorized the installation and operation of two landfill gas-fired combustion turbines and two heat recovery steam generators to generate approximately 28.2 MW of electrical power through Notice of Construction Order No. 08AQ-080, issued October 8, 2008. The Order also authorized the installation and operation of a new landfill gas treatment system to remove sulfur compounds and siloxanes from the landfill gas for use in the combustion turbines.

In 2009, Klickitat PUD proposed changes in equipment. KPUD stated that a fire pump which had been approved by the Order, would not be installed at the site. KPUD instead proposed to install a smaller diesel-fueled fire pump, not subject to air emissions new source review under Washington State air quality regulations. KPUD also proposed the installation and operation of an enclosed landfill gas flare in place of an open candle-type flare which had been approved by the Order. Order No. 08AQ-C080, First Revision, issued March 2, 2010, was issued to approve these changes, and to update the Order to be consistent with recent changes to air toxics regulation.

One turbine and the landfill gas treatment system commenced operation on September 29, 2010, and the second turbine commenced operation on October 29, 2010. However, KPUD ceased operations of these facilities on December 3, 2010, when it became apparent that the landfill gas treatment system was not functioning properly. KPUD replaced the malfunctioning sulfur removal portion of the system with functioning Redox System.

On February 9, 2011, Klickitat PUD submitted a request to extend the deadline for initial performance testing of the combustion turbines, and to approve alternate compliance methods with the total fuel sulfur limit. KPUD proposed compliance with the total fuel sulfur limit through continuous monitoring of the major fuel sulfur compound, H₂S, provided that annual performance testing indicates the method is appropriate. Ecology granted revisions to the performance testing deadline and approved the alternate sulfur monitoring methodologies in Order No. 08AQ-C080, Second Revision, issued March, 25, 2011. Ecology also granted an extension to the combustion turbine performance testing required by WAC 173-400-115 in an Ecology letter, dated March 25, 2011.

On April 29, 2013, Klickitat PUD submitted a request to increase the maximum allowable landfill gas flow to each turbine, from 3,630 cubic feet per minute (cfm) to 4,000 cfm. The request resulted in a decrease in the short term emission limits for PM₁₀ and VOC, with no change in allowable annual emissions. Additionally, the allowable annual emissions of 20 Toxic Air Pollutants increased to levels that remain below their respective Acceptable Source Impact Level, per WAC 173-460-150. Ecology granted this request by issuance of Order No. 08AQ-C080 Third Revision, on November, 26, 2013.

5.3 Renewable Natural Gas Plant

Ecology originally authorized the installation and operation of a renewable natural gas plant, through Notice of Construction Approval Order No. 08AQ-C080 Fourth Revision, issued September 28, 2017. On February 9, 2018, Ecology received notification that construction activities had begun, with the hope to achieve substantial completion in June 2018, and immediately begin startup activities with commercial operation scheduled to begin August 1, 2018. Following commissioning of the new plant, the RNG plant may not operate concurrently with the power plant.

5.4 Prevention of Significant Deterioration (PSD).

The H.W. Hill Landfill Gas Power Plant and the Roosevelt Regional Landfill are considered separate sources because they have separate ownership (i.e. different standard industrial classification codes).

Sources with the potential to emit greater than specified amounts of criteria pollutants are required to obtain a second air quality permit, the Prevention of Significant Deterioration (PSD) permit, prior to starting construction. Due to the industrial category of this source, the PSD triggering thresholds are 250 tons per year (tpy) for each pollutant.

6.0 AIR OPERATING PERMIT HISTORY

Title V of the 1990 Federal Clean Air Act Amendments required all states to develop a renewable operating permit program for industrial and commercial source of air pollution. Congress structured the air operating permit system as an administrative tool for applying existing regulations to individual sources. The goal is to enhance accountability and compliance by clarifying in a single document which requirements apply to a given business or industry.

The Washington State Clean Air Act (chapter 70.94 Revised Code of Washington) was amended in 1991 and 1993 to provide the Department of Ecology and local air agencies with the necessary authority to implement a state-wide operating permit program. The law requires all sources emitting one hundred tons or more per year of a regulated pollutant, or ten tons of a hazardous air pollutant, or twenty-five tons in the cumulative of hazardous air pollutants, to obtain an operating permit.

Ecology authored chapter 173-401 of the Washington Administrative Code (WAC), which specified the requirements of Washington State's Operating Permit Regulation. This regulation became effective on November 4, 1993. On November 1, 1993, the regulation was submitted to the United States Environmental Protection Agency (EPA), for program approval. On December 9, 1994, EPA granted interim approval of Chapter 173-401 WAC. This

interim approval was extended until EPA granted final approval on August 13, 2001, whereby the regulation became federally enforceable. The current, state-only enforceable, version of this regulation was filed on February 3, 2016.

On November 30, 1999, Ecology notified KPUD that a complete Air Operating Permit application was due, no later than April 11, 2000, based upon records that the H.W. Hill Landfill Gas Power Plant commenced operation on or about April 12, 1999. At that same time, Ecology sent an Air Operating Permit application to KPUD. Subsequently, KPUD notified Ecology that the first engine commenced operation on April 15, 1999, and thus their AOP application was due on April 14, 2000. Ecology received KPUD's initial application on March 15, 2000, and issued a notification of incompleteness on March 28, 2000. Ecology received KPUD's complete and timely Air Operating Permit application on April 14, 2000. KPUD's initial draft permit was issued and began public comment on May 2, 2001. The public comment period closed, with no comments having been received, on June 9, 2001. Ecology issued a proposed permit, for EPA review, on June 13, 2001, and received notification from EPA that the permit was "eligible for issuance," on July 30, 2001. Ecology issued final initial Air Operating Permit No. 01 AQCR-3159, to KPUD, on August 6, 2001.

KPUD's first renewal draft permit was issued and began public comment on January 30, 2006. The public comment period closed, with no comments having been received, on March 13, 2006. Renewal Air Operating Permit No. 06AQ-C026 was issued August 4, 2006.

On February 9, 2010, Ecology received KPUD's second AOP renewal application, which included the combustion turbine covered by NOC Order No. 08AQ-C080, and issued a notification of completeness on April 2, 2010. Renewal Air Operating Permit No. 11AQ-C163, was issued August 1, 2011.

Additional AOP processing information can be found in the "timeline" contained in Section 2.0.

7.0 FEDERAL REGULATIONS

7.1 New Source Performance Standard (NSPS).

On March 12, 1996, EPA promulgated the Standards of Performance for Municipal Solid Waste Landfills (Title 40 Code of Federal Regulations Part 60 Subpart WWW). The NSPS applies to each municipal solid waste landfill that commenced construction, reconstruction, or modification, or began accepting waste, on or after May 30, 1991.

The Roosevelt Regional Landfill, where the Plant is located, is subject to the requirements of 40 CFR Part 60 Subpart WWW, Standards of Performance for Municipal Solid Waste Landfills (NSPS). As owner and operator of the affected facility, Republic Services is required to demonstrate compliance with all applicable provisions of NSPS Subpart WWW, including 40 CFR 60.752(b)(2)(iii)(B), requiring reduction of NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume. Gases generated by the landfill are collected and sent to KPUD, which combusts those gases to generate electricity for sale. KPUD is located adjacent to Republic Services on land leased from Republic Services. Currently, Republic Services and KPUD are separate entities, not under "common control" as that term is used in the Clean Air Act. And, although a contract exists between Republic Services and KPUD, the owner of a regulated facility cannot contract away its liability. Therefore, KPUD is not subject to the NSPS (See 8/15/00 letter from Douglas Hardesty, EPA Region 10, to Ali Nikukar, ODEQ, regarding Valley Landfill NSPS Subpart WWW Applicability, for further guidance on this topic).

On July 6, 2006, EPA promulgated the Standards of Performance for Stationary Combustion Turbines (Title 40 Code of Federal Regulations Part 60 Subpart KKKK). The NSPS establishes emission standards and compliance schedules for the control of emissions from stationary combustion turbines. The NSPS applies to stationary combustion turbines with a heat input at peak load equal to or greater than 10.7 gigajoules (10 MMBtu) per hour, which commenced construction, reconstruction, or modification after February 18, 2005. KPUD is subject to the requirements of 40 CFR Part 60 Subpart KKKK as the two turbines each have a peak load of 10.6 MW and commenced construction on December 12, 2008. The turbines may use water injection to control NO_x. As owner and operator of the affected facility, KPUD is required to demonstrate compliance with all applicable provisions of NSPS Subpart KKKK.

Subpart KKKK exempts subject stationary combustion turbines from the requirements of subpart GG. Subpart KKKK also exempts subject heat recover steam generators from the requirements of subparts Da, Db, and Dc.

On July 7, 2016, EPA promulgated the Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (Title 40 Code of Federal Regulations Part 60 Subpart IIII). The NSPS establishes operating and compliance requirements for manufacturers, owners, and operators of stationary compression ignition internal combustion engines, installed according to specified size and date of manufacture. The 149 horsepower diesel fired fire pump engine is subject to this requirements of 40 CFR Part 60 Subpart IIII as it is a fire pump engines with a displacement of less than 30 liters per cylinder installed after July 11, 005 and manufactured after July 1, 2006. As owner and operator of the affected unit, KPUD is required to demonstrate compliance with the applicable provisions of NSPS Subpart IIII.

Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (Title 40 Code of Federal Regulations Part 60 Subpart JJJJ) became effective on March 18, 2008. The NSPS establishes operating and compliance requirements for new, modified, and reconstructed stationary spark ignition internal combustion engines. The 40 horsepower propane fired emergency generators were manufactured on or after January 1, 2009, with a maximum engine power greater than 19 KW (25 HP). These emergency generators are subject to the requirements of 40 CFR Part 60 Subpart JJJJ. As owner and operator of the affected unit, KPUD is required to demonstrate compliance with the applicable provisions of NSPS Subpart JJJJ.

7.2 National Emission Standard for Hazardous Air Pollutants (NESHAP).

On January 16, 2003, EPA promulgated the National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills (Title 40 Code of Federal Regulations Part 63 Subpart AAAA). The NESHAP applies to municipal solid waste landfills that have accepted waste since November 8, 1987, or has additional capacity for waste deposition, and may include a bioreactor, and meets any one of three other criteria. Again, while the Roosevelt Regional Landfill is subject to these requirements, the H.W. Hill Landfill Gas Power Plant is not.

8.0 GREENHOUSE GAS REPORTING

8.1 Federal Greenhouse Gas Reporting.

On October 30, 2009, EPA published a rule for the mandatory reporting of greenhouse gases (GHG) (also referred to as 40 CFR part 98) from large GHG emissions sources. The rule applies to certain facilities, including those which emit 25,000 metric tons CO₂e or more per year in combined emissions from all stationary fuel combustion sources. While KPUD's potential GHG emissions are approximately 145,000 metric tons of CO₂e per year, §98.2(b)(2) excludes carbon dioxide emissions from the combustion of biomass from being used in the comparison to the 25,000 metric tons CO₂e reporting threshold. KPUD's biomass reduced potential applicable GHG emissions are approximately 725 metric tons of CO₂e per year. Therefore, KPUD has reported it is not subject to the Mandatory Greenhouse Gas Reporting rule.

Regardless of applicability of the Mandatory Greenhouse Gas Reporting rule to KPUD, Title 40 CFR Part 98, Federal Mandatory Reporting of Greenhouse Gases, is not an AOP applicable requirement. According to EPA guidance as published in the Federal Register (56288 FR 74:209, Friday, October 30, 2009), the requirements imposed by this rule are not applicable requirements under the Title V operating permit program.

8.2 State Greenhouse Gas Reporting.

On December 1, 2010, Ecology promulgated Chapter 173-441 WAC – Reporting of Emissions of Greenhouse Gases. The WAC incorporates by reference certain, but not all, calculation methods and other requirements from 40 CFR Part 98, the federal Mandatory Greenhouse Gas Reporting rule. The WAC applies to any facility that emits 10,000 metric tons of CO₂e or more per calendar year in total GHG emissions, including biogenic CO₂, from all applicable source categories listed in WAC 173-441-120.

KPUD may be subject to the requirements of chapter 173-441 WAC if actual GHG emissions are greater than 10,000 MT of CO₂e per year. Potential GHG emissions are greater than 10,000 MT of CO₂e per year. As owner and operator of the affected facility, KPUD is required to demonstrate compliance with all applicable provisions of chapter 173-441 WAC.

9.0 CLEAN AIR RULE

On September 15, 2016, Ecology adopted Chapter 173-442 WAC – Clean Air Rule (CAR). The CAR specifies that it is not an AOP applicable requirement, hence it is not addressed in the AOP. However, as adopted, this rule is anticipated to eventually apply to this source. On December 15, 2017, Thurston County Superior Court rules on parts of the Clean Air Rule. In response, Ecology suspended the rule’s compliance requirements, while working to understand the court’s decision. Sources covered by the rule are still required to report their emissions for the Greenhouse Gas Reporting program discussed in Section 8.0.

10.0 COMPLIANCE ASSURANCE MONITORING (CAM).

10.1 Criteria.

On October 22, 1997, EPA promulgated the Compliance Assurance Monitoring rule (Title 40 Code of Federal Regulations Part 64). This Rule requires specialized pollutant-specific monitoring for those emission units which meet the following criteria:

- 10.1.1 The unit is located at a Title V Air Operating Permit source
- 10.1.2 The unit is subject to an emission limitation or standard for the applicable regulated air pollutant (or surrogate thereof), other than an emission limitation or standard that is exempt.
- 10.1.3 The unit uses a control device to achieve compliance with any such emission limitation or standard; and
- 10.1.4 The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as an Air Operating Permit source.

10.2 Applicability.

The combustion turbines each have the potential to emit 134.7 tons per year (tpy) of NO_x, which exceeds the 100 tpy threshold for a source to be classified as a major source for NO_x emissions. However, post combustion “control devices” are not used at the facility and NO_x CEMS are required. Therefore, CAM is not applicable.

11.0 INSIGNIFICANT EMISSION UNITS AND ACTIVITIES

The source contains the following categorically exempt insignificant emission units:

- lubricating oil storage tanks [WAC 173-401-532(3)]
- fuel analyzer vent [WAC 173-401-532(8)]
- generator room vents [WAC 173-401-532(9)]
- internal combustion engines on motor vehicles [WAC 173-401-532(10)]
- brazing, soldering, welding, etc. [WAC 173-401-532(12)]
- plant upkeep, painting, etc. [WAC 173-401-532(33)]
- portable drums and totes [WAC 173-401-532(42)]
- comfort air conditioning [WAC 173-401-532(46)]
- bathroom vent [WAC 173-401-532(48)]
- office activities [WAC 173-401-532(49)]
- personal care activities [WAC 173-401-532(50)]
- sampling connections [WAC 173-401-532(51)]
- fuel and exhaust emissions from motor vehicles [WAC 173-401-532(54)]
- machining operations-indoors [WAC 173-401-532(55)]
- sample gathering, prep, mgmt. [WAC 173-401-532(73)]
- repair & maintenance [WAC 173-401-532(74)]
- batteries & battery charging [WAC 173-401-532(77)]
- air compressors & tools [WAC 173-401-532(88)]
- non-PCB oil-filled breakers, etc. [WAC 173-401-532(118)]
- combustion sources less than 0.5 MMBtu/hr (196 hp) using fuel with less than 1% by weight sulfur (1 fire pump and 2 emergency generators) [WAC 173-401-533(2)(f)]

Designation of an emission unit or activity as insignificant does not exempt the unit or activity from all applicable requirements. The designation also does not affect the authority of ecology and local air authorities to establish case-by-case monitoring requirements as set forth in WAC 173-400-105 or other provisions of law. Specifically, insignificant emission units are still subject to general rules.

12.0 GAPFILLING

Section 6 of the air operating permit identifies requirements that are applicable to existing emission units at the source. The air operating permit must contain emission limitations and standards, including those operational requirements and limitations that assure compliance with all applicable requirements at the time of permit issuance. Where the applicable requirement does not require periodic testing or monitoring, periodic monitoring sufficient to yield reliable data has been identified and included in the permit. This action is termed gapfilling. The last column of the tables in Section 6, contains the monitoring, recordkeeping, and reporting to be performed by the permittee (MRR). This column identifies the periodic action that must be taken to demonstrate compliance with the applicable requirement. It should be noted that in addition to the MRR a source must consider all other credible evidence when certifying to their compliance status.

For some applicable requirements no action is warranted and instead the permittee will annually certify their compliance status. These requirements are identified with, "no additional monitoring required," stated in the MRR column.

Many applicable requirements specify periodic MRR while, where appropriate, gapfilling was used for the remainder. When not specified by the underlying applicable requirement, the source of the MRR is identified in brackets for each MRR requirement. Those that reference WAC 173-401-615(1) were gapfilled. Below is a brief explanation of the basis for each instance of gapfilling.

Table 3: Identification and basis of “gapfilled” items.

Applicable Requirement	Gapfilling basis
2.1.4, 2.1.17	This source has not had a history of violating these "nuisance" requirements. Since these could be subjective, Ecology determined it was appropriate to consider complaints in MRR.
2.1.5	Ecology believes that these requirements are best served by requiring the source to annually review the specific documents.
2.1.8, 2.1.9, 2.4.12	This source has not had a history of visible emissions and is not expected to have problems complying with established visible emission standards. Monthly MRR was determined to be appropriate. Additionally, action is required when visible emissions are observed at times other than the monthly survey.
2.1.10, 2.1.11, 2.1.12, 2.1.14, 2.1.21, 2.1.22, 2.1.23, 2.1.24, 2.1.25, 2.1.26, 2.1.27, 2.4.4, 2.4.6, 2.4.9b, 2.4.11b, 2.4.11c	Ecology believes that compliance with these requirements will be sufficiently demonstrated by compliance with the specified requirement.
2.2.3, 2.3.1, 2.4.5, 2.6.4, 2.6.5	Ecology believes some simple records should be kept.
2.5.3, 2.5.4, 2.5.4, 2.5.6, 2.5.7, 2.6.6, 2.6.7, 2.6.8, 2.6.9, 2.6.10	The EPA Federal Reference Methods listed in the Monitoring and Analysis Procedure or Test Method column are included as a means to determine compliance with the specified emission limits. However, there are no initial or ongoing performance test requirements associated with the emission limits.

13.0 STREAMLINING

Streamlining is the subsuming of a less stringent requirement by a clearly more stringent requirement. This Air Operating Permit contains no streamlining.

14.0 COMPLIANCE CERTIFICATION

By virtue of the Air Operating Permit application and the issuance of this permit, the reporting frequency for compliance certification for this source shall be annual.

15.0 ENFORCEABILITY

Unless specifically designated otherwise, all terms and conditions of the Air Operating Permit, including any provisions designed to limit the source's potential to emit, are enforceable by EPA, and citizens, under the Federal Clean Air Act. Those terms and conditions which are designated as state-only enforceable, by (S), are enforceable only by Ecology. State-only terms and conditions will become federally enforceable upon approval of the requirement in the State Implementation Plan. However, the enforceability of the terms and conditions of this Air Operating Permit are not expected to change during the Permit term. All terms and conditions of the Air Operating Permit are enforceable by Ecology.

Following is an example of how to identify a state-only enforceable condition. At the end of Condition 2.7.2 the following notation occurred: "[WAC 173-400-107, 8/20/93, 9/13/16 (S)]." If a version of the regulation is cited with no reference to enforceability, it is federally enforceable. Thus, this notation means that the authority for this permit condition is contained in the 8/20/93 version of WAC 173-400-107 (this is the version of WAC 173-400-107 that is in the Washington State Implementation Plan (SIP) and is thus federally enforceable) and in the 9/13/16 version of WAC 173-400-107. The (S) after 9/13/16 means that the 9/13/16 version of WAC 173-400-107 is State-only enforceable.

References to WAC and RCW rules are given with the respective chapter's most recent filing date. Emergency rules adopted under RCW 34.05.350 become effective upon filing unless a later date is specified in the order of adoption. All other rules become effective and enforceable upon the expiration of thirty days after the date of filing, unless a later date is required by statute or specified in the order of adoption.

16.0 OPERATIONAL FLEXIBILITY

The permittee did not request or specify any alternative operating scenarios.

However, it is anticipated that in the near future the RNG will replace operation of the combustion turbines. In the event that an emission unit is not operated during a period equal to or greater than the monitoring period designated, no monitoring is required (e.g. A monthly visible emission survey is not required if the emission unit is not operated during the month that the survey covers. A monthly visible emission survey is required if the emission unit is operated for any portion of the month that the survey covers). Recordkeeping and reporting must note the reason why, and length of time, the emission unit was not operated.

Additionally, in the event that an emission unit is operated solely for maintenance purposes during a period equal to or greater than the monitoring period designated, no monitoring is required. (e.g. A monthly visible emission survey is not required if the emission unit is only operated for maintenance purposes during the month that the survey covers. A monthly visible emission survey is required if the emission unit is used for generation of electricity for any portion of the month that the survey covers.) Recordkeeping and reporting must note the occurrence and nature of the maintenance and a statement that generation was not performed by the emission unit.

17.0 OTHER PERMITTING ISSUES

17.1 State Ambient Air Quality Standards.

The following regulations are ambient air quality standards that apply generally to all areas of the state. There are no on-going monitoring, recordkeeping, or reporting requirements specific to the source to prove compliance with the ambient air quality standards. Compliance with the ambient air quality standards is required, and the following regulations are triggered for any source when undergoing New Source Review for Notice of Construction or Prevention of Significant Deterioration permitting and are generally reported in the permits as findings as required, or when an actual or suspected violation of an ambient air quality standard is found locally.

WAC 173-470-010, -020, -030, -100, -160, 1/3/89

WAC 173-470-110, -150, 1/3/89 (S)
WAC 173-474, 9/30/87 (S)
WAC 173-475, 2/29/80 (S)

18.0 COMPLIANCE SUMMARY

18.1 Compliance Status

The most recent Full Compliance Evaluation (FCE)¹ was completed for KPUD on October 28, 2016. The FCE showed that as of September 9, 2016, KPUD was *in compliance*² with their existing AOP. Documents related to this and other FCEs completed for KPUD are available for public viewing from the Department of Ecology, Central Regional Office.

18.2 Turbine Performance Testing

Between March 29, 2011 and October 4, 2011, KPUD was in violation of 40 CFR Part 60 Subpart KKKK, §60.8(a). KPUD was unable to conduct performance testing of the combustion turbines in compliance with the NSPS mandated schedule. The NSPS requires performance testing for NO_x and SO₂ to be conducted within 180 days after initial startup of each turbine. The fuel system supporting the combustion turbines failed, which caused the facility to shut the units down. The turbines were not operated during replacement of the fuel cleaning system. The tests were postponed until October 4, 2011 when the tests were passed. The facility is now in compliance with the NSPS.

Prior to testing, KPUD requested an extension to the testing deadline from Ecology and the EPA. Ecology modified NOC Order No. 08AQ-080 to accommodate the extension, and granted an extension under the state adopted version of 40 CFR Part 60 Subpart KKKK. An extension was not granted by the EPA for the equivalent deadline under the federal version of 40 CFR Part 60 Subpart KKKK; therefore, the deviations qualified as Tier 1 Federally Reportable Violation (FRV).

18.3 Turbine Operation Below Low Load Source Test Levels

On November 1, 2012, Ecology issued NOV No. 9594 to KPUD, for emitting more CO than allowed by their air quality permit during operation of Combustion Turbine #2 below the unit's most recent low load source test level. Specifically, the NOV referenced a CO exceedance, as measured by the CO CEMS for a one hour period. KPUD's electrical dispatching agent, The Energy Authority, had ordered curtailment of power production for the one hour period; complying with the order resulted in the aforementioned operation of the turbine. KPUD has since documented, both internally and with The Energy Authority, that the turbines will not be operated below low load source test levels henceforth. Instead, should a curtailment order which would result in operation of either turbine below those levels occur, the facility will shut the unit(s) down for the specified period.

¹ An FCE is a comprehensive evaluation of the compliance status of a source. It evaluates all regulated pollutants at all regulated emission units, and it addresses the compliance status of each unit, as well as the source's continuing ability to maintain compliance at each emission unit.

² Defined per: HPV criteria from "The Timely and Appropriate (T&A) Enforcement Response to High Priority Violations (HPVs)", issued by EPA 12/22/98; and FRV criteria from the memorandum "Clarification Regarding Federally-Reportable Violations for Clean Air Act Stationary Sources", issued by EPA 3/22/10.