



**Midwest Area
Crown Castle**
2000 Corporate Dr.
Canonsburg, PA 15317

Tel (724) 416-2723
Fax (724) 416-4471
Michael.Knabe@crowncastle.com
www.crowncastle.com

Rothwell
PD15-013
061-00016

February 9, 2015

WV DEP Division of Air Quality
Beverly McKeone
601 57th St. SE
Charleston, WV 25304

RE: Crown Castle Site Name: WVU DAS
Address: 1 Ira Errett Rodgers Dr. Morgantown, WV

Beverly,

Per our discussion Crown Castle is seeking to install an emergency generator as part of the DAS system (Cell site) at the location above. I've attached a determination application as well as specs for the engine, and calculations regarding pollutants.

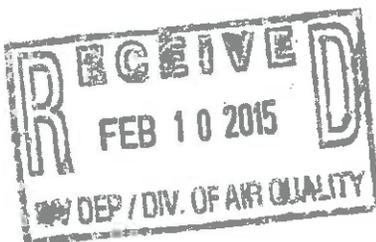
Please let me know if this generator falls within the thresholds to not require a permit.

Please notify me of any fees and I will ensure they are promptly paid. Requests for additional information and/or documentation can be directed to me at 724-416-2723 or Michael.Knabe@Crowncastle.com

On behalf of Crown Castle, I would like to thank you for your assistance and I look forward to your prompt response.

Sincerely,

Michael Knabe
Real Estate Specialist, Midwest Area





WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57th Street, SE
Charleston, WV 25304
Phone: (304) 926-0475
www.dep.wv.gov/daq

**PERMIT DETERMINATION FORM
(PDF)**

FOR AGENCY USE ONLY: PLANT I.D. # _____
PDF # _____ PERMIT WRITER _____

1. NAME OF APPLICANT (AS REGISTERED WITH THE WV SECRETARY OF STATE'S OFFICE):
Crown Castle Solutions Corp

2. NAME OF FACILITY (IF DIFFERENT FROM ABOVE):
WVU Das Hub

3. NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODE:

4A. MAILING ADDRESS:
*2000 Corporate Dr.
Canonsburg PA 15317*

4B. PHYSICAL ADDRESS:
Same

5A. DIRECTIONS TO FACILITY (PLEASE PROVIDE MAP AS ATTACHMENT A):

5B. NEAREST ROAD:

5C. NEAREST CITY OR TOWN:

5D. COUNTY:

5E. UTM NORTHING (KM):

5F. UTM EASTING (KM):

5G. UTM ZONE:

6A. INDIVIDUAL TO CONTACT IF MORE INFORMATION IS REQUIRED:
Michael Knabe

6B. TITLE:
RE Specialist

6C. TELEPHONE:
724-416-2723

6D. FAX:
724-416-4471

6E. E-MAIL:
Michael.Knabe@CrownCastle.com

7A. DAQ PLANT I.D. NO. (FOR AN EXISTING FACILITY ONLY):

7B. PLEASE LIST ALL CURRENT 45CSR13, 45CSR14, 45CSR19 AND/OR TITLE V (45CSR30) PERMIT NUMBERS ASSOCIATED WITH THIS PROCESS (FOR AN EXISTING FACILITY ONLY):

7C. IS THIS PDF BEING SUBMITTED AS THE RESULT OF AN ENFORCEMENT ACTION? IF YES, PLEASE LIST:
NO

8A. TYPE OF EMISSION SOURCE (CHECK ONE):
 NEW SOURCE ADMINISTRATIVE UPDATE
 MODIFICATION OTHER (PLEASE EXPLAIN IN 11B)

8B. IF ADMINISTRATIVE UPDATE, DOES DAQ HAVE THE APPLICANT'S CONSENT TO UPDATE THE EXISTING PERMIT WITH THE INFORMATION CONTAINED HEREIN?
 YES NO

9. IS DEMOLITION OR PHYSICAL RENOVATION AT AN EXISTING FACILITY INVOLVED? YES NO

10A. DATE OF ANTICIPATED INSTALLATION OR CHANGE:
____/____/20____ *TBD*

10B. DATE OF ANTICIPATED START-UP:
____/____/20____ *TBD*

11A. PLEASE PROVIDE A DETAILED PROCESS FLOW DIAGRAM SHOWING EACH PROPOSED OR MODIFIED PROCESS EMISSION POINT AS ATTACHMENT B.

11B. PLEASE PROVIDE A DETAILED PROCESS DESCRIPTION AS ATTACHMENT C.

12. PLEASE PROVIDE MATERIAL SAFETY DATA SHEETS (MSDS) FOR ALL MATERIALS PROCESSED, USED OR PRODUCED AS ATTACHMENT D. FOR CHEMICAL PROCESSES, PLEASE PROVIDE A MSDS FOR EACH COMPOUND EMITTED TO AIR.

13A. REGULATED AIR POLLUTANT EMISSIONS:

⇒ FOR A NEW FACILITY, PLEASE PROVIDE PLANT WIDE EMISSIONS BASED ON THE POTENTIAL TO EMIT (PTE) FOR THE FOLLOWING AIR POLLUTANTS INCLUDING ALL PROCESSES.

⇒ FOR AN EXISTING FACILITY, PLEASE PROVIDE THE PROPOSED CHANGE IN EMISSIONS BASED ON THE PTE OF ALL PROCESS CHANGES FOR THE FOLLOWING AIR POLLUTANTS.

PTE FOR A GIVEN POLLUTANT IS TYPICALLY BEFORE AIR POLLUTION CONTROL DEVICES AND IS COLLECTED BASED ON THE MAXIMUM DESIGN CAPACITY OF PROCESS EQUIPMENT.

POLLUTANT	HOURLY PTE (LB/HR)	YEARLY PTE (TON/YR) (HOURLY PTE MULTIPLIED BY 8760 HR/YR) DIVIDED BY 2000 LB/TON
PM	<i>See Attached</i>	
PM ₁₀		
VOCs		
CO		
NO _x		
SO ₂		
Pb		
HAPs (AGGREGATE AMOUNT)		
TAPs (INDIVIDUALLY)*		
OTHER (INDIVIDUALLY)*		

* ATTACH ADDITIONAL PAGES AS NEEDED

13B. PLEASE PROVIDE ALL SUPPORTING CALCULATIONS AS ATTACHMENT E.

CALCULATE AN HOURLY AND YEARLY PTE OF EACH PROCESS EMISSION POINT (SHOWN IN YOUR DETAILED PROCESS FLOW DIAGRAM) FOR ALL AIR POLLUTANTS LISTED ABOVE INCLUDING INDIVIDUAL HAP'S (LISTED IN SECTION 112(b) OF THE 1990 CAAA), TAP'S (LISTED IN 45CSR27), AND OTHER AIR POLLUTANTS (E.G. POLLUTANTS LISTED IN TABLE 45-13A OF 45CSR13, MINERAL ACIDS PER 45CSR7, ETC.).

14. CERTIFICATION OF DATA

I, M. Ke. Kuehl (Agent for Crown Castle) (TYPE NAME) ATTEST THAT ALL THE REPRESENTATIONS CONTAINED IN THIS APPLICATION, OR APPENDED HERETO, ARE TRUE, ACCURATE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE BASED ON INFORMATION AND BELIEF AFTER REASONABLE INQUIRY, AND THAT I AM A RESPONSIBLE OFFICIAL* (PRESIDENT, VICE PRESIDENT, SECRETARY OR TREASURER, GENERAL PARTNER OR SOLE PROPRIETOR) OF THE APPLICANT.

SIGNATURE OF RESPONSIBLE OFFICIAL: _____

TITLE: _____

DATE: 2.9.15

** THE DEFINITION OF THE PHRASE 'RESPONSIBLE OFFICIAL' CAN BE FOUND AT 45CSR13, SECTION 2.23.

NOTE: PLEASE CHECK ENCLOSED ATTACHMENTS:

ATTACHMENT A ATTACHMENT B ATTACHMENT C ATTACHMENT D ATTACHMENT E

RECORDS ON ALL CHANGES ARE REQUIRED TO BE KEPT AND MAINTAINED ON-SITE FOR TWO (2) YEARS.

THE PERMIT DETERMINATION FORM WITH THE INSTRUCTIONS CAN BE FOUND ON DAQ'S PERMITTING SECTION WEB SITE:

www.dep.wv.gov/daq

Knabe, Michael

From: Coccari, Gene M <Gene.M.Coccari@wv.gov>
Sent: Thursday, February 05, 2015 3:58 PM
To: Knabe, Michael
Subject: RE: Crown Castle Generator Specs

Hello-

For the John Deere 177 kW diesel-fired emergency generator, given the information you supplied from the manufacturer, I have calculated the following pollutant emissions:

$\text{NO}_x = 3.79 \text{ g/kW-hr} * 177 \text{ kW} = 670.83 \text{ g/hr NO}_x$

$\text{NO}_x = 670.83 \text{ g/hr divided by } 454 \text{ g/lb} = \mathbf{1.48 \text{ pounds per hour (PPH) NO}_x}$

The Potential to Emit or PTE for emergency generators are calculated using 500 hrs/yr, so the yearly amount would be $1.48 \text{ PPH} * 500 \text{ hrs/yr} = 740 \text{ pounds per year (PPY)}$ or **0.37 tons per year (TPY) NO_x**

$\text{CO} = 1.2 \text{ g/kW-hr} * 177 \text{ kW} = 212.4 \text{ g/hr CO}$

$\text{CO} = 212.4 \text{ g/hr divided by } 454 \text{ g/lb} = \mathbf{0.47 \text{ PPH CO}}$

The yearly amount would be $0.47 \text{ PPH} * 500 \text{ hrs/yr} = 235 \text{ PPY}$ or **0.12 TPY CO**

$\text{PM} = 0.12 \text{ g/kW-hr} * 177 \text{ kW} = 21.24 \text{ g/hr PM}$

$\text{PM} = 21.24 \text{ g/hr divided by } 454 \text{ g/lb} = \mathbf{0.047 \text{ PPH PM}}$

The yearly amount would be $0.047 \text{ PPH} * 500 \text{ hrs/yr} = 23 \text{ PPY}$ or **0.012 TPY PM**

HC (for VOCs) has the same emission (0.12 g/kW-hr) as PM (particulate matter), so the calculation is the same as for the PM emissions above, yielding **0.047 PPH HC** and **0.012 tons per year (TPY) HC** (hydrocarbons)

I understand that you spoke with the NSR Permitting Supervisor, and she advised you that if the emissions are below the 45CSR13 permitting thresholds, that you could submit a permit determination and it would be possible that the finding would be "No Permit Needed." As the 45CSR13 threshold is 6 PPH and 10 TPY, or 144 pounds per day for regulated pollutants, given the emissions calculations above, it would seem you are well below said threshold. As it seems that this engine is post-2006, there is also a federal rule that determines applicability. Newer diesel-fueled engines, used to power emergency generators, are governed by federal New Source Performance Standards (NSPS) codified at 40 CFR Part 60, Subpart IIII, which outline "Standards of Performance for Stationary Compression Ignition (CI) Internal Combustion Engines." This rule covers diesel (CI) emergency generators manufactured after 4/1/2006. The Agency has determined that if the engine is certified by U.S. EPA that it meets the NSPS. Given this, coupled together with the fact that the engine's emissions are also less than 6 PPH of the largest pollutant (in this case NO_x), it should be eligible for submission in a permit determination (as opposed to filing a permit application).

The information you submitted shows that this engine is indeed a certified engine, although you could also request a Certificate of Conformity from the engine manufacturer which would show this as well. The permit determination form can be downloaded from the DEP's website at:

<http://www.dep.wv.gov/daq/permitting/Pages/nsr-forms.aspx>, and the form needed is at the top of the page. I would submit all the information that you sent to me, along with a copy of this e-mail with the permit determination, in which you should provide the emission amounts shown above in **BOLD**. The original signature form (signed in blue ink by a responsible official), along with two copies, should be sent to the NSR

Permitting Supervisor at the address provided below. If you have any questions regarding this correspondence, or if I can be of additional assistance, please advise. Thank you.

Gene M. Coccari
Environmental Resource Analyst
WV Department of Environmental Protection
Small Business Assistance Program
601 57th Street, SE
Charleston, WV 25304

ph: (304) 926-0499 ext. 1245
fax: (304) 926-0479

From: Knabe, Michael [<mailto:Michael.Knabe@crowncastle.com>]
Sent: Wednesday, February 04, 2015 3:41 PM
To: Coccari, Gene M
Subject: Crown Castle Generator Specs

Gene,

Thanks again for speaking with me today. Attached are the specs for our generator, as well as a location map. If you need any additional info please let me know.

Thanks,

Michael Knabe
Real Estate Specialist – Services – Pittsburgh District
T: (724) 416-2723 | M: (724) 787-8948 | F: (724) 416-4471

CROWN CASTLE
2000 Corporate Drive, Canonsburg, PA 15317
CrownCastle.com

This email may contain confidential or privileged material. Use or disclosure of it by anyone other than the recipient is unauthorized. If you are not an intended recipient, please delete this email.

DIESEL GENERATOR SET MTU 6R0113 DS150

150 kW_e / 60 Hz / Standby
208 - 600V

Reference MTU 6R0113 DS150 (135 kW_e) for Prime Rating Technical Data



SYSTEM RATINGS

Standby

Phase	1	1	3	3	3	3
PF	1	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	150	150	150	150	150	150
kVA	150	150	187.5	187.5	187.5	187.5
Amps	625	625	520	451	226	180
skVA@30%						
Voltage Dip	182	195	296	296	394	315
Generator Model	431CSL6208	431PSL6224	431CSL6202	431CSL6202	431CSL6202	431PSL6240
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD ZIG-ZAG	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

** UL 2200 Offered

CERTIFICATIONS AND STANDARDS

- // **Emissions** – EPA Tier 3 Certified
- // **Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004**
- // **Seismic Certification** – Optional
 - IBC Certification
 - OSHPD Pre-Approval
- // **UL 2200 / CSA** – Optional
 - UL 2200 Listed
 - CSA Certified
- // **Performance Assurance Certification (PAC)**
 - Generator Set Tested to ISO 8528-5 for Transient Response
 - Verified product design, quality and performance integrity
 - All engine systems are prototype and factory tested
- // **Power Rating**
 - Accepts Rated Load in One Step Per NFPA 110

STANDARD FEATURES*

- MTU Onsite Energy is a single source supplier
 - Global Product Support
 - 2 Year Standard Warranty
 - 6068HF285 Diesel Engine
 - 6.8 Liter Displacement
 - 4-Cycle
 - Engine-generator resilient mounted
 - Complete Range of Accessories
- /// Generator
 - Brushless, Rotating Field Generator
 - 2/3 Pitch Windings
 - 300% Short Circuit Capability with Optional PMG
 - /// Digital Control Panel(s)
 - UL Recognized, CSA Certified, NFPA 110
 - Complete System Metering
 - LCD Display
 - /// Cooling System
 - Integral Set-Mounted
 - Engine Driven Fan

STANDARD EQUIPMENT*

/// Engine

Air Cleaner
 Oil Pump
 Oil Drain Extension & S/O Valve
 Full Flow Oil Filter
 Fuel Filter with Water Separator
 Jacket Water Pump
 Thermostat
 Blower Fan & Fan Drive
 Radiator - Unit Mounted
 Electric Starting Motor - 12V
 Governor - Electronic Isochronous
 Base - Formed Steel
 SAE Flywheel & Bell Housing
 Charging Alternator - 12V
 Battery Box & Cables
 Flexible Fuel Connectors
 Flexible Exhaust Connection
 EPA Certified Engine

/// Generator

NEMA MG1, IEEE and ANSI standards compliance for temperature rise and motor starting
 Self-Ventilated and Drip-Proof
 Superior Voltage Waveform
 Solid State, Volts-per-Hertz Regulator
 ±1% Voltage Regulation No Load to Full Load
 Brushless Alternator with Brushless Pilot Exciter
 4 Pole, Rotating Field

130 °C Maximum Standby Temperature Rise
 1 Bearing, Sealed
 Flexible Coupling
 Full Amortisseur Windings
 125% Rotor Balancing
 3-Phase Voltage Sensing
 100% of Rated Load - One Step
 5% Maximum Total Harmonic Distortion

/// Digital Control Panel(s)

Digital Metering
 Engine Parameters
 Generator Protection Functions
 Engine Protection
 SAE J1939 Engine ECU Communications
 Windows®-Based Software
 Multilingual Capability
 Remote Communications to RDP-110 Remote Annunciator
 Programmable Input and Output Contacts
 UL Recognized, CSA Certified, CE Approved
 Event Recording
 IP 54 Front Panel Rating with Integrated Gasket
 NFPA110 Compatible

* Represents standard product only. Consult Factory/MTU Onsite Energy Distributor for additional configurations.

APPLICATION DATA

// Engine

Manufacturer	John Deere
Model	6068HF285
Type	4-Cycle
Arrangement	6-Inline
Displacement: L (in ³)	6.8 (415)
Bore: cm (in)	10.6 (4.19)
Stroke: cm (in)	12.7 (5)
Compression Ratio	19:1
Rated RPM	1,800
Engine Governor	JDEC
Maximum Power: kWm (bhp)	177 (237)
Speed Regulation	±0.25%
Air Cleaner	Dry

// Liquid Capacity (Lubrication)

Total Oil System: L (gal)	20 (5.28)
Engine Jacket Water Capacity: L (gal)	12.3 (3.25)
System Coolant Capacity: L (gal)	22.7 (6)

// Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

// Fuel System

Fuel Supply Connection Size	3/8" NPT
Fuel Return Connection Size	3/8" NPT
Maximum Fuel Lift: m (ft)	2 (6.7)
Recommended Fuel	Diesel #2
Total Fuel Flow: L/hr (gal/hr)	107.2 (28.3)

// Fuel Consumption

At 100% of Power Rating: L/hr (gal/hr)	44.7 (11.8)
At 75% of Power Rating: L/hr (gal/hr)	34.8 (9.2)
At 50% of Power Rating: L/hr (gal/hr)	25.4 (6.7)

// Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Allowable Static Pressure on Rad. Exhaust: kPa (in. H ₂ O)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	180 (48)
Heat Rejection to Coolant: kW (BTUM)	93.5 (5,324)
Heat Rejection to Air to Air: kW (BTUM)	32 (1,821)
Heat Radiated to Ambient: kW (BTUM)	25.7 (1,461)
Fan Power: kW (hp)	10.7 (14.3)

// Air Requirements

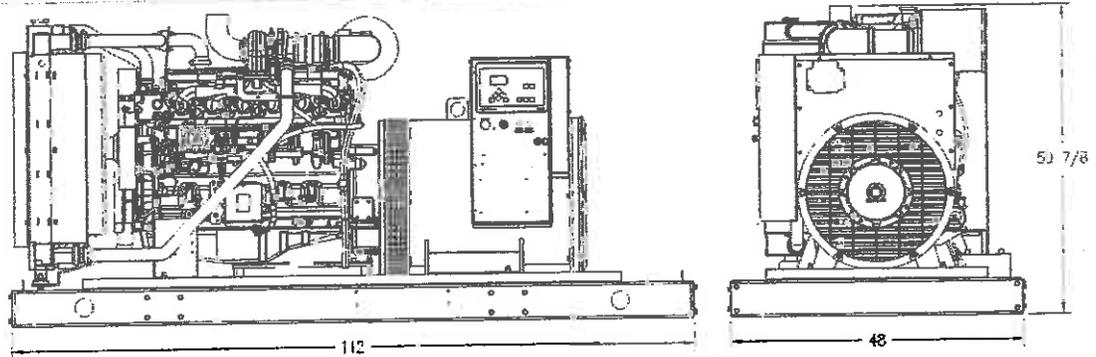
Aspirating: *m ³ /min (SCFM)	13.6 (480)
Air Flow Required for Rad. Cooled Unit: *m ³ /min (SCFM)	304 (10,732)
Remote Cooled Applications; Air Flow Required for Dissipation of Radiated Gen-set Heat for a Max of 25 °F Rise: *m ³ /min (SCFM)	94 (3,295)

* Air density = 1.184 kg/m³ (0.0739 lbm/ft³)

// Exhaust System

Gas Temp. (Stack): °C (°F)	505 (941)
Gas Volume at Stack Temp: m ³ /min (CFM)	34 (1,201)
Maximum Allowable Back Pressure: kPa (in. H ₂ O)	7.5 (30)

WEIGHTS AND DIMENSIONS



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

Open Power Unit (OPU)

2,845 x 1,219 x 1,283 mm (112 x 48 x 50.5 in)

1,592 kg (3,510 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

SOUND DATA

Level 0: Open Power Unit dB(A)

85.1

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

EMISSIONS DATA

3.83

0.4

0.06

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values). Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA Standards.

RATING DEFINITIONS AND CONDITIONS

Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average load factor: $\leq 85\%$.

Deration Factor:

Altitude: Consult your local MTU Onsite Energy Power Generation Distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation Distributor for temperature derations.

C/F = Consult Factory/MTU Onsite Energy Distributor

N/A = Not Available

MTU Onsite Energy
A Rolls-Royce Power Systems Brand

www.mtuonsiteenergy.com

Rating Specific Emissions Data - John Deere Power Systems



Rating Data

Rating	6068HF285K	
Certified Power(kW)	177	
Rated Speed	1800	
Vehicle Model Number	OEM (Gen Set Emergency)	
Units	g/kW-hr	g/hp-hr
NOx	3.35	2.50
HC	0.14	0.10
NOx + HC	N/A	N/A
Pm	0.12	0.09
CO	1.1	0.8

Certificate Data

Engine Model Year	2014
EPA Family Name	EJDXL06.8120
EPA JD Name	350HAK
EPA Certificate Number	EJDXL06.8120-010
CARB Executive Order	
Parent of Family	6068HFG82A
Units	g/kW-hr
NOx	3.79
HC	0.12
NOx + HC	N/A
Pm	0.12
CO	1.2

* The emission data listed is measured from a laboratory test engine according to the test procedures of 40 CFR 89 or 40 CFR 1039, as applicable. The test engine is intended to represent nominal production hardware, and we do not guarantee that every production engine will have identical test results. The family parent data represents multiple ratings and this data may have been collected at a different engine speed and load. Emission results may vary due to engine manufacturing tolerances, engine operating conditions, fuels used, or other conditions beyond our control.

This information is property of Deere & Company. It is provided solely for the purpose of obtaining certification or permits of Deere powered equipment. Unauthorized distribution of this information is prohibited.

Emissions Results by Rating run on Jan-14-2014