NEPR

Received:

Aug 12, 2022

5:06 PM

GOBIERNO DE PUERTO RICO
JUNTA REGLAMENTADORA DEL SERVICIO PÚBLICO
NEGOCIADO DE ENERGÍA DE PUERTO RICO

IN RE: TARIFA PERMANENTE DE LA AUTORIDAD DE ENERGÍA ELÉCTRICA DE PUERTO RICO

CASO NÚM.: NEPR-MI-2020-0001

ASUNTO: Moción Para Presentar Informe de Reclamaciones Correspondiente al Periodo del 5 a 11 de Agosto de 2022

MOCIÓN PARA PRESENTAR INFORME DE RECLAMACIONES CORRESPONDIENTE AL PERIODO DEL 5 A 11 DE AGOSTO DE 2022

AL HONORABLE NEGOCIADO DE ENERGÍA:

COMPARECE la Autoridad de Energía Eléctrica de Puerto Rico (la "Autoridad"), a través de su representación legal, y muy respetuosamente expone, alega y solicita:

I. INFORME DE RECLAMACIONES

El pasado 24 de septiembre de 2020, el Negociado de Energía de la Junta Reglamentadora de Servicio Público ("Negociado de Energía") notificó una *Resolución y Orden* ("Orden del 24 de septiembre") que, en la parte aquí relevante, indica:

> 1. Presentar ante el Negociado de Energía un Informe semanal de Reclamaciones ("Informe de Reclamaciones"), en o antes de las 5:00 pm, de cada viernes. La Autoridad debe presentar el primer informe el 25 de septiembre de 2020. Dicho informe debe incluir las gestiones realizadas con relación a las reclamaciones presentadas por la Autoridad ante FEMA y la(s) compañía(s) de seguro(s). Dicho informe deberá estar acompañado de cualquier documento relacionado *(e.g.,* cartas, solicitudes, correos electrónicos). Este requisito permanecerá en vigor hasta tanto el Negociado de Energía determine lo contrario y es independiente y separado de cualquier solicitud de información establecida por el Negociado de Energía en algún otro proceso.
>
> …
>
> Adicional a la orden anterior, el Negociado de Energía añade los siguientes requerimientos:

> 1. La Autoridad debe incluir, en el primer Informe de Reclamaciones, un recuento de todas las reclamaciones hechas a la(s) compañía(s) de seguro privadas por concepto de "Extra Expense" a causa de los eventos sísmicos del pasado mes de enero [de 2020]. Incluyendo, pero sin limitarse a, el análisis utilizado para calcular los costos incrementales reclamados.
>
> 2. Asegurarse que las mociones utilizadas en futuras radicaciones incluyan una clara explicación de lo solicitado y la documentación de apoyo pertinente, de manera que los consumidores reciban información de una forma efectiva sobre los procedimientos de la Autoridad ante el Negociado de Energía y se minimice la necesidad de solicitar información adicional.
>
> 3. Cualquier desviación de las proyecciones sometidas en un periodo anterior debe ser claramente explicada en las mociones futuras de la Autoridad y representada de forma comparativa (proyección/estimado anterior vs. dato/evento real) mediante la utilización de graficas. Además, los documentos presentados en formato Excel también deberán ser presentados en formato PDF. La versión en formato PDF debe tener un tamaño de hoja que los datos sean legibles y utilizar márgenes predefinidos que minimicen el número de hojas del documento. Todo ello para facilitar la revisión de la información para los consumidores.

Orden del 24 de septiembre en pp. 3-4.

El 31 de julio de 2022, el Negociado notificó una *Resolución y Orden* ("Orden del 31 de julio") relacionada al Informe de Reclamaciones en la cual ordena a la Autoridad, entre otras cosas, a:

> incluir en los informes semanales información detallada debidamente actualizada de los esfuerzos realizados a tales efectos e incluir en dichos informes copia de cualquier documento, comunicación o trámite (*i.e.*, por la vía digital o impresa) entre la Autoridad y las agencias concernidas, incluyendo los tramites realizados ante la EPA con relación a los mega-generadores.

Orden del 31 de julio en p. 15.

II. INFORME DE RECLAMACIONES

En cumplimiento con las órdenes citadas arriba, la Autoridad presenta el Informe de Reclamaciones correspondiente al periodo del 5 a 11 de agosto de 2022. Anejo A.

En relación con la Orden del 31 de julio, en el Informe de Reclamaciones radicado ante el Negociado el 5 de agosto de 2022 ("Informe de 5 de agosto"), la Autoridad presentó un total de total de cuarenta y ocho (48) archivos que identificó como responsivos. Ese mismo día la Autoridad informó que, como el Negociado no estableció en su Orden del 31 de julio el periodo que comprende la producción de documentos que ahí se ordena, la Autoridad continuaba realizando un análisis sus archivos para continuar con la producción de información responsiva adicional. Además, la Autoridad informó que el tiempo entre la notificación de la Orden del 31 de julio y la presentación del Informe de 5 de agosto, no dio tiempo suficiente para recopilar y producir toda la información y, además, evaluar si existe causa para reclamar confidencialidad sobre esta. Así las cosas, la Autoridad informó que produciría comunicaciones y documentos que se identificaran luego de la presentación del Informe de 5 de agosto hasta el día de hoy.

En cumplimiento con la Orden del 31 de julio y las aseveraciones de la Autoridad incluidas en el Informe del 5 de agosto, la Autoridad presenta el Anejo A-3 que incluye varios archivos responsivos a la orden de "incluir en los informes semanales información detallada debidamente actualizada de los esfuerzos realizados a tales efectos e incluir en dichos informes copia de cualquier documento, comunicación o trámite (i.e., por la vía digital o impresa) entre la Autoridad y las agencias concernidas, incluyendo los tramites realizados ante la [Agencia de Protección Ambiental de Estados Unidos (EPA, por sus siglas en inglés)] con relación a los mega-generadores." Orden del 31 de julio en p. 15. Se informa además que la Autoridad continúa investigando si existe información adicional responsiva a la citada orden. De existir información adicional se producirá al Negociado de Energía con el próximo informe.

III. INFORMACIÓN CONFIDENCIAL

El 31 de agosto de 2016, el Negociado de Energía emitió una *Resolución* ("Resolución de 31 de agosto") en el caso *In Re: Política Sobre Manejo de Información Confidencial en los Procedimientos ante la Comisión*, caso núm.: NEPR-MI-2016-0009, mediante la cual estableció las normas y procedimientos aplicables a la presentación de reclamos de confidencialidad, la evaluación de dichos reclamos por el Negociado y las normas que regirían una vez el Negociado emita una determinación en cuanto a dichos reclamos. En la Resolución del 31 de agosto el Negociado determinó que "[l]a Parte Producente deberá, simultáneamente con la presentación de la Información Confidencial, radicar un memorando de derecho [al Negociado] estableciendo por escrito las bases legales que apoyan su argumento de que la información presentada contiene información confidencial y merece algún tipo de protección." Resolución del 31 de agosto en p.1, ¶ A. 2. Sin embargo, el 20 de septiembre de 2016, el Negociado estableció un término específico para peticiones de confidencialidad el procedimiento de revisión de tarifas de la Autoridad, caso número CEPR-AP-2015-0001. El 17 de enero de 2020, el Negociado emitió una *Resolución y Orden* bajo el referido caso en el cual estableció que la Autoridad debe presentar bajo el caso de epígrafe todas las radicaciones futuras relacionadas a los factores propuestos, incluyendo las reconciliaciones.

El día de hoy la Autoridad ha presentado al Negociado los anejos A-1 y A-3(b) sellados ya que contienen información que la Autoridad considera confidencial. Así las cosas, y en cumplimiento con la Resolución del 31 de agosto, según enmendada el 20 de septiembre de 2016, la Autoridad presentará al Negociado un memorando que incluye las bases legales que apoyan el argumento de confidencialidad y la petición para que los referidos anejos permanezcan sellados en un término de cinco (5) días contados a partir de la presentación de este escrito.

IV. CONCLUSIÓN

POR TODO LO CUAL, se solicita respetuosamente al Negociado de Energía que determine que la Autoridad ha complido con la órdenes del 24 de septiembre de 2020 y del 31 de julio de 2022.

RESPETUOSAMENTE SOMETIDO.

En San Juan, Puerto Rico a 12 de agosto de 2022.

f/ Katiuska Bolaños Lugo
Katiuska Bolaños Lugo
TSPR 18,888
kbolanos@diazvaz.law

DÍAZ & VÁZQUEZ LAW FIRM, P.S.C.
290 Jesús T. Piñero Ave.
Oriental Tower, Suite 803
San Juan, PR 00918
Tel. (787) 395-7133
Fax. (787) 497-9664

CERTIFICADO DE NOTIFICACIÓN

Certifico que este escrito ha sido presentado a la Secretaria del Negociado de Energía a través del sistema electrónico de radicación https://radicacion.energia.pr.gov/ y, además, copia del mismo ha sido notificado a la Oficina de Protección al Consumidor por conducto de la Lic. Hannia Rivera a hrivera@oipc.pr.gov y a LUMA Energy ServCo, LLC y LUMA Energy, LLC por conducto de la Lic. Margarita Mercado a margarita.mercado@us.dlapiper.com.

En San Juan, Puerto Rico, hoy 12 de agosto de 2022.

f/ Katiuska Bolaños Lugo
Katiuska Bolaños Lugo

Anejo A

CLAIMS REPORT

I. Claim to Insurers

The Authority continues to work diligently to recover from its insurance companies the costs of losses and damages resulting from the earthquake that occurred on January 7, 2020. The Authority has filed a claim for additional fuel expenses (extra expense) until January 31, 2021, for a total of $130,861,001 and has provided evidence of the cost of property damage over $50,000,000. The preparation, submission, and adjustment of insurance claims are ongoing, and the claim amounts submitted herein are subject to update and revision.

For the easy reference of the Energy Bureau and the consumers of the Authority, a summary of the claim as of August 10, 2022, is included below.

CLAIM ELEMENT	RTS CURRENT VIEW OF UNDISPUTED CLAIM AMOUNTS [1]	PREPA's CURRENT VIEW OF CLAIM [2] (AS OF 8/10/2022)			
		INCURRED	ADDITIONAL AMOUNTS COMMITTED	ESTIMATE TO COMPLETE	TOTAL
PROPERTY DAMAGE [3]	$ 35,500,000	$ 39,236,276	$ 15,203,467	$ 12,966,615	$ 67,406,359
EXTRA EXPENSE (Net of 30-day waiting period)	61,000,000	130,681,001			130,681,001
BUSINESS INTERRUPTION	TBD	TBD	TBD	TBD	TBD
TOTAL	$ 96,500,000	$ 169,917,277	$ 15,203,467	$ 12,966,615	$ 198,087,360
LESS:					
- Deductible	(25,000,000)	(25,000,000)			(25,000,000)
- Advance Payments (collected)	(70,000,000)	(70,000,000)			(70,000,000)
CURRENT ESTIMATED CLAIM BALANCE	$ 1,500,000	$ 74,917,277	$ 15,203,467	$ 12,966,615	$ 103,087,360

NOTES

[1] Figures reflect analysis by the insurer adjustment team as of 4/21/2022 and are subject to change and further adjustment.
[2] All figures contained herein are preliminary and subject to material revision or change.
[3] Property Damage figure includes $3.8MM for miscellaneous extra expense and professional fees.

Likewise, the Authority continues to work with insurers to advance in the adjustment process as follows:

1. Maintain regular communication with insurance adjusters, consultants, and accountants.
2. Provide information, documents, and analyses on time.
3. Coordinate inspections and analyses to support the development and adjustment of the Authority's claim.

4. Collaborate with all the dependencies and offices of the Authority to ensure coordination in recovery efforts with the Federal Emergency Management Agency (FEMA) and insurers.
5. Respond to correspondence regarding coverage from insurers and technical reports and analyses from Adjuster consultants.
6. Request additional support from LUMA Energy, LLC., operator of the Puerto Rico transmission and distribution system and provider of PREPA insurance claims services, to continue processing claims.

The Authority continues to direct its efforts to negotiations to obtain additional payments. Payments received by insurers to date are listed below:

SUMS RECEIVED

Date	Payment Method	Deposited in Bank	Payer	Amount
6/17/2020	Wire Transfer	June 2020	Willis Towers Watson	$ 8,000,000.00
6/17/2020	Check	June 2020	Multinational Insurance Company	2,625,000.00
6/17/2020	Check	June 2020	MAPFRE	12,500,000.00
6/23/2020	Wire Transfer	June 2020	Willis Towers Watson	1,250,000.00
7/17/2020	Check	July 2020	Multinational Insurance Company	625,000.00
10/30/2020	Wire Transfer	October 2020	Willis Towers Watson	3,562,500.00
11/4/2020	Wire Transfer	November 2020	Willis Towers Watson	1,875,000.00
11/10/2020	Wire Transfer	November 2020	Willis Towers Watson	750,000.00
11/10/2020	Check	November 2020	MAPFRE	12,500,000.00
11/25/2020	Check	November 2020	Multinational Insurance Company	6,312,500.00
8/4/2021	Check	August 2021	MAPFRE	10,000,000.00
9/7/2021	Wire Transfer	September 2021	Lockton Specialties, LLC.	3,350,000.00
9/17/2021	Wire Transfer (US)	September 2021	Lockton Specialties, LLC.	1,100,000.00
9/23/2021	Wire Transfer (UK)	September 2021	Lockton Specialties, LLC.	600,000.00
10/12/2021	Wire Transfer (UK)	October 2021	Multinational Insurance Company	4,050,000.00
10/14/2021	Check	Oct-21	Multinational Insurance Company	900,000.00
Total				**70,000,000.00**

In compliance with the Orders, the Authority attaches a report with additional details of communications between the Authority, the adjusters, the insurance companies and, in addition, a compendium of the communications and related documents. (Annex A-1)

Anejo A-1

[*Presentado sellado*]

II. RECLAMACIÓN A FEMA

La Autoridad, como sub-recipiente, ha continuado los esfuerzos y los trabajos en conjunto con la Agencia Federal para el Manejo de Emergencias (FEMA, por sus siglas en inglés) y la Oficina Central de Recuperación, Reconstrucción y Resiliencia (COR3) para así continuar la reclamación y la aprobación de los daños causados. El 3 de febrero de 2022, la Autoridad le informó a FEMA los esfuerzos de las reclamaciones de seguro actualizando la reclamación de *“extra-expense*” a un total $130,681,001, la cual incluye sólo gastos de combustible. El detalle de la reclamación se incluye como Anejo A-2.

A la fecha de este informe, la reclamación incluye un total de gastos incurridos de aproximadamente $515,911,965, de los cuales se ha reclamado al seguro de la Autoridad la cantidad de $130,681,001, reduciendo la cantidad del proyecto reclamado a FEMA a $385,230,964. La aportación federal de 90% de esta reclamación asciende a $346,707,868.

Concepto de Costos		**Total**
Combustible:	$	375,006,183
O & M:		140,905,782
Total	**$**	**515,911,965**
Seguro	$	130,681,001
Porcion a Reembolso Federal		385,230,964
Pareo Federal (90%)	**$**	**346,707,868**

Por tanto, los costos estimados asociados a combustible a ser reembolsados por las aseguradoras y FEMA aumentan a un total de $350,573,665.

Reducción por concepto de Seguro por combustible:

	SEGURO	FEMA		TOTAL
Combustible:	130,681,001.00	244,325,182.32	D	$ 375,006,183.32
O & M:	-	140,905,782.07		$ 140,905,782.07
Total	**130,681,001.00**	**385,230,964.39**		**$ 515,911,965.39**

Reducción por Pareo Local

	100%	90%	TOTAL
Total de Combustible a recibirse:	130,681,001.00	219,892,664.09	$ 350,573,665.09
		D x 90%	

El 11 de marzo de 2022, FEMA y COR3 formalizaron un acuerdo para incrementar la aportación federal de un 75% a un 90%. Dicho incremento se refleja en la reclamación a través de enmiendas efectuadas directamente entre FEMA y COR3 y que no requiere acción de la Autoridad.

Sin embargo, el incremento en la aportación federal no ha tomado efecto aún en el proyecto ya que la enmienda por razón de la extensión de tiempo presentada el 11 de diciembre de 2020 aún se mantiene bajo la evaluación de FEMA.

El 26 de julio de 2022, COR3 envió una comunicación a la Autoridad en la cual incluyen copia de una carta dirigida al Presidente del Negociado de Energía de Puerto Rico, en la que indican que FEMA notificó al Gobierno de Puerto Rico que se realizaría un aumento en el proyecto de los terremotos para reflejar un incremento del 75% al 90%, aumentando así la obligación corriente por $47,604,606, de $238,023,030 (75%) a un nuevo total $285,627,636 (90%). Dicho incremento no refleja la enmienda sometida el 11 de diciembre que incorpora los costos incurridos para el periodo del 16 de julio de 2020 al 31 de enero de 2021. La carta de COR3 explica que el reembolso de esta diferencia está sujeta a que la Autoridad finalice el cumplimiento con los requerimientos de la Agencia Federal de Protección Ambiental (EPA, por sus siglas en inglés) y el área Ambiental y de Preservación Histórica (EHP, por sus siglas en inglés) de FEMA. Este cumplimiento está relacionado con los tres (3) mega-generadores instalados en la Central Palo Seco, los cuales se encuentran bajo un proceso de pruebas de emisiones que debe finalizar entre agosto y septiembre de 2022.

Se incluyen como Anejo A-3[1] de este reporte copias de documentos, comunicaciones y evidencia de trámites entre la Autoridad y las agencias concernidas, incluyendo la EPA, con relación a los mega-generadores.

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1 El Anejo A-3 incluye información sobre la cual la Autoridad reclama confidencialidad y que se mantenga [illegible] Anejo A-3 se divide en Anejo A-3(a), en el cual obran las comunicaciones y

El 1 de agosto de 2022, en una reunión realizada con FEMA, la Autoridad advino en conocimiento que EHP determinó proceder con la enmienda sujeto a una evaluación subsiguiente del cumplimiento de las unidades de Palo Seco. Por tanto, la Autoridad espera que la aprobación sobre los costos incurridos desde agosto 2020 hasta enero 2021, incluyendo la reducción por $10,090,052.10 notificada el 21 de julio de 2022, sea aprobada por FEMA a principios del mes de agosto 2022.

El 10 de agosto de 2022, se efectuó una reunión con COR3 donde se le notifico a la Autoridad que el proyecto aun no ha culminado su proceso de aprobación.

No obstante, el 5 de agosto de 2022, la Autoridad envió a COR3 la documentación relacionada a la petición de reembolso y solicito que se evaluara la misma de manera anticipada previo a la obligación.

El 21 de julio de 2022, la Autoridad fue notificada por COR3 que FEMA, a través de un análisis de razonabilidad de costos, determinó que bajo la evaluación de la revisión sometida el 11 de diciembre de 2020, que aumentó la reclamación por $131,761,553, un total de $10,090,052.10 no son considerados como elegibles. La determinación alude que dicha cantidad excedía la opción más costo efectiva y práctica en proveer energía sin hacer determinación sobre la porción de combustible, operación y mantenimiento.

Aunque la Autoridad tiene derecho a apelar dicha determinación y la misma no goza de finalidad, se realizó el siguiente análisis para determinar el impacto en los reembolsos de combustibles.

Porción de Combustible sobre Proyecto de FEMA:

	Total FEMA		*Ajuste DM*	**Pendiente Aprobación**	
Total de Combustible a recibirse	244,325,182	63%	(6,399,418)	237,925,765	G
Porción de O&M	140,905,782	37%	(3,690,634)	137,215,148	
Total	385,230,964	F	(10,090,052)	375,140,912	

	100%	90% (G x 90%)	TOTAL	
Combustible a recibirse luego de DM:	130,681,001	214,133,188	344,814,189	H

Resolución y Orden emitida por el NEPR - 31 de marzo de 2021	316,548,997	
Resolución y Orden emitida por el NEPR - 31 de julio de 2022	34,024,668	
Total Diferido	350,573,665	
Nuevo total de Combustible	344,814,189	H
	5,759,476	***Exceso diferido***

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documentos públicos; y el Anejo A-3(b), en el cual obran las comunicaciones y documentos responsivos ... na son confidenciales y ha presentado al Negociado sellados.

Como previamente expuesto, el costo de combustible a ser reclamado por FEMA totaliza $244,325,182 representando un 63% del total de $385,230,964.

Por tanto, se le confiere la misma proporción a la determinación de $10,090,052 reduciendo la porción de combustible por $6,399,418 resultando en un total de $237,925,765. Luego de la reducción de aportación local (10%) se estima que la porción de combustible a recibirse por FEMA ($214,133,188) y las aseguradoras ($130,681,001) seria $344,814,189.

Por tanto, considerando los balances diferidos al 31 de marzo de 2021 por $316,548,997 e incluyendo la nueva determinación efectuada el 31 de julio de 2022 por $34,024,668, el total diferido aumenta a $350,573,665. De la Autoridad no ser exitosa en la apelación sobre la determinación realizada por FEMA que reduce la reclamación por $10,090,052, el balance diferido en exceso se estima totalizaría en $5,759,476.

A la fecha de este informe la Autoridad ha recibido un total de $238,023,030.75, límite obligado, basado en el estimado inicial de $384,150,412 del cual $302,372,077 son por concepto de combustible y un total de $81,778,335 por operación y mantenimiento. El total obligado y recibido corresponde al 75% de $317,364,041, que es la diferencia entre el total de $384,150,412 y la reclamación al seguro de $66,786,371. Del total obligado y recibido de $238,023,030.75, unos $176,689,279.73 corresponden a reembolso por combustible.

Es importante recalcar que la porción de combustible mantiene conceptos de reducción de seguro que hoy día se estiman en $130,681,001. De dicha reclamación materializarse por parte de las aseguradoras la porción atribuida a combustible se reduciría por la misma cuantía dejando un total de costos estimados menor al reportado. Por tanto, la porción recibida y a recibirse de los rembolsos de la agencia federal se podrán certificar cuando la Autoridad finalice su reclamación al seguro y se materialice la enmienda de revisión de costos para los periodos no aprobados. Las cantidades reclamadas al seguro y FEMA son estimadas, las cuales se revisan y validan continuamente durante la evaluación de las reclamaciones que realizan estas entidades. Se reitera el que los diferidos de los cargos de la compra de combustible facturado a los consumidores debe realizarse cuando la Autoridad ha recibido el reembolso o cuando hay certeza de que se recibirá dicho reembolso.

GOBIERNO DE PUERTO RICO
AUTORIDAD DE ENERGÍA ELÉCTRICA

Anejo A-2

[*Versión nativa enviada por correo electrónico el NEPR para que lo suba a su página web*]

Reclamación DR-4473-007 Resumen

Periodo Enero 2020 - Enero 2021

Concepto de Costos	Obligado (Enero a Junio 2020)		Enmienda (Julio 2020 a Enero 2021)		Total	
Combustible:	$ 302,372,077		$ 72,634,106		$ 375,006,183	C
O & M:	81,778,335		59,127,447		140,905,782	
Total	**$ 384,150,412**		**$ 131,761,553**		**$ 515,911,965**	
Seguro	$ 66,786,371		$ 63,894,630		$ 130,681,001	
Porción a Reembolso Federal	317,364,041		67,866,923		385,230,964	F
Pareo Federal (75%)[A]	**$ 238,023,031**	A	**$ 50,900,193**		**$ 288,923,223**	
Pareo Federal (90%)[B]	**$ 285,627,637**	B	**$ 61,080,231**		**$ 346,707,868**	
Diferencia entre Pareo Federal (B-A)	**$ 47,604,606**		**$ 10,180,039**		**$ 57,784,645**	

A La porción federal calculada en el proyecto obligado fue 75%.

B De conformidad con la enmienda al acuerdo entre la Agencia Federal para el Manejo de Emergencias y la Oficina Central de Recuperación, Reconstrucción y Resiliencia el pasado 11 de marzo de 2022 para las subvenciones bajo FEMA-4473-DR.

C El gasto total de combustible en el periodo de la reclamación.

Reducción por concepto de Seguro por combustible:

	SEGURO	FEMA		TOTAL	
Combustible:	130,681,001.00	244,325,182.32	D	$ 375,006,183.32	C
O & M:	-	140,905,782.07		$ 140,905,782.07	
Total	**130,681,001.00**	**385,230,964.39**		**$ 515,911,965.39**	

Reducción por Pareo Local

	100%	90%	TOTAL
Total de Combustible a recibirse:	130,681,001.00	219,892,664.09	$ 350,573,665.09
		D x 90% = E	

	TOTAL	Recibido	Pendiente
Combustible Rembolsable por FEMA	219,892,664.09	176,689,279.73	43,203,384.36
Combustible Rembolsable por Seguro	130,681,001.00	61,000,000.00	69,681,001.00
	$ 350,573,665.09	$ 237,689,279.73	$ 112,884,385.36

Porción de Combustible sobre Proyecto de FEMA:

	Total FEMA			*Ajuste DM*	Pendiente Aprobación	
Total de Combustible a recibirse	244,325,182	63%		(6,399,418)	237,925,765	G
Porción de O&M	140,905,782	37%		(3,690,634)	137,215,148	
Total	385,230,964		F	(10,090,052)	375,140,912	

	100%	90%	TOTAL	
		G x 90%		
Combustible a recibirse luego de DM:	130,681,001	214,133,188	344,814,189	H

Resolución y Orden emitida por el NEPR - 31 de marzo de 2021	316,548,997	
Resolución y Orden emitida por el NEPR - 31 de julio de 2022	34,024,668	
Total Diferido	350,573,665	
Nuevo total de Combustible	344,814,189	H
	5,759,476	***Exceso diferido***

PREPA - Peaking Generator Analysis for Earthquakes
For the period - January 2020 to January 2021

Plant	Description	January 1/1 - 1/31	February 2/1 - 2/29	March 3/1 - 3/31	April 4/1 - 4/30	May 5/1 - 5/31	June 6/1 - 6/30	July 7/1 - 7/31	August 8/1 - 8/31	September 9/1 - 9/30	October 10/1 - 10/31	November 11/1 - 11/30	December 12/1 - 12/31	January 1/1 - 1/31
Aguirre	Depreciation Expense	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Fuel Costs	21,348,823	26,999,051	18,514,408	19,344,681	14,531,076	14,989,949	18,334,185	16,556,865	10,230,439	15,916,144	9,820,679	8,328,859	5,303,920
	Variable and Fixed O&M Costs	4,942,896	6,661,903	5,847,063	6,924,269	7,183,800	6,715,873	6,853,948	6,171,985	4,666,167	6,048,366	4,609,120	4,324,864	3,358,984
	Subtotal	**$ 26,291,719**	**$ 33,660,954**	**$ 24,361,471**	**$ 26,268,949**	**$ 21,714,876**	**$ 21,705,822**	**$ 25,188,133**	**$ 22,728,850**	**$ 14,896,606**	**$ 21,964,510**	**$ 14,429,799**	**$ 12,653,724**	**$ 8,662,903**
Cambalache	Depreciation Expense	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Fuel Costs	9,265,852	8,303,337	2,993,363	2,876,842	4,391,252	1,838,459	3,224,628	3,091,888	2,098,700	2,295,778	1,458,977	1,362,144	524,655
	Variable and Fixed O&M Costs	391,086	413,167	267,627	279,313	364,540	258,465	317,961	305,203	262,551	271,371	227,653	228,592	189,867
	Subtotal	**$ 9,656,937**	**$ 8,716,504**	**$ 3,260,989**	**$ 3,156,155**	**$ 4,755,792**	**$ 2,096,924**	**$ 3,542,589**	**$ 3,397,091**	**$ 2,361,251**	**$ 2,567,149**	**$ 1,686,631**	**$ 1,590,736**	**$ 714,522**
Mayaguez	Depreciation Expense	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Fuel Costs	3,548,543	3,873,558	2,078,296	2,501,147	2,958,331	3,244,355	4,240,479	3,795,098	2,063,490	2,337,797	604,452	1,372,298	399,417
	Variable and Fixed O&M Costs	394,547	474,678	381,603	442,266	543,100	624,085	689,434	651,785	468,006	503,798	267,207	351,689	237,344
	Subtotal	**$ 3,943,090**	**$ 4,348,235**	**$ 2,459,900**	**$ 2,943,412**	**$ 3,501,432**	**$ 3,868,440**	**$ 4,929,914**	**$ 4,446,883**	**$ 2,531,496**	**$ 2,841,596**	**$ 871,660**	**$ 1,723,986**	**$ 636,761**
Daguao	Depreciation Expense	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Fuel Costs	2,062,683	1,352,815	310,681	892,165	978,944	475,052	769,616	645,785	698,753	641,279	431,056	294,199	90,951
	Variable and Fixed O&M Costs	238,106	202,560	118,290	166,211	175,763	134,870	190,908	172,613	180,832	177,358	144,664	127,661	101,004
	Subtotal	**$ 2,300,789**	**$ 1,555,375**	**$ 428,971**	**$ 1,058,376**	**$ 1,154,707**	**$ 609,922**	**$ 960,524**	**$ 818,398**	**$ 879,585**	**$ 818,637**	**$ 575,720**	**$ 421,860**	**$ 191,955**
Vega Baja	Depreciation Expense	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Fuel Costs	6,281	598,449	254,138	369,058	144,295	81,386	166,250	106,424	291,060	477,032	160,905	173,799	102,451
	Variable and Fixed O&M Costs	75,153	137,535	116,311	129,014	123,400	109,163	112,979	106,437	137,899	153,872	115,423	115,423	106,174
	Subtotal	**$ 81,433**	**$ 735,984**	**$ 370,450**	**$ 498,072**	**$ 267,694**	**$ 190,549**	**$ 279,229**	**$ 212,861**	**$ 428,959**	**$ 630,904**	**$ 276,328**	**$ 289,222**	**$ 208,625**
Yabucoa	Depreciation Expense	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Fuel Costs	1,186,242	613,218	210,793	396,158	360,424	304,428	295,894	181,365	391,892	376,050	93,673	303,511	12,810
	Variable and Fixed O&M Costs	170,765	144,846	111,984	130,871	129,741	126,732	126,631	116,392	132,648	143,614	104,094	128,388	94,360
	Subtotal	**$ 1,357,007**	**$ 758,064**	**$ 322,776**	**$ 527,030**	**$ 490,164**	**$ 431,160**	**$ 422,524**	**$ 297,757**	**$ 524,540**	**$ 519,664**	**$ 197,767**	**$ 431,898**	**$ 107,170**
Palo Seco	Depreciation Expense	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Fuel Costs	10,425,840	10,034,776	9,838,835	8,828,660	7,788,148	7,408,959	9,076,020	5,192,992	1,419,381	2,381,514	1,097,884	471,000	336,245
	Variable and Fixed O&M Costs	4,136,587	4,891,279	6,201,735	4,826,395	5,562,713	5,693,637	5,561,016	3,585,931	1,919,778	2,300,859	1,784,134	1,553,861	1,488,310
	Subtotal	**$ 14,562,427**	**$ 14,926,055**	**$ 16,040,570**	**$ 13,655,055**	**$ 13,350,860**	**$ 13,102,596**	**$ 14,637,037**	**$ 8,778,923**	**$ 3,339,159**	**$ 4,682,373**	**$ 2,882,018**	**$ 2,024,861**	**$ 1,824,556**
Jobos	Depreciation Expense	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Fuel Costs	1,118,285	763,956	286,520	394,900	717,960	390,247	415,301	361,386	664,711	991,421	118,437	180,531	38,096
	Variable and Fixed O&M Costs	170,423	167,867	120,956	139,514	189,515	148,844	147,762	141,958	179,782	224,087	108,557	116,089	97,329
	Subtotal	**$ 1,288,709**	**$ 931,823**	**$ 407,476**	**$ 534,415**	**$ 907,475**	**$ 539,091**	**$ 563,063**	**$ 503,344**	**$ 844,493**	**$ 1,215,508**	**$ 226,994**	**$ 296,620**	**$ 135,425**
Total Period Costs	Depreciation Expense	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Fuel Costs	48,962,550	52,539,158	34,487,033	35,603,610	31,870,430	28,732,836	36,522,374	29,931,803	17,858,426	25,417,015	13,786,064	12,486,341	6,808,545
	Variable and Fixed O&M Costs	10,519,562	13,093,835	13,165,570	13,037,853	14,272,571	13,811,669	14,000,640	11,252,303	7,947,662	9,823,327	7,360,852	6,946,566	5,673,372
	Total	**$ 59,482,111**	**$ 65,632,994**	**$ 47,652,603**	**$ 48,641,463**	**$ 46,143,001**	**$ 42,544,505**	**$ 50,523,013**	**$ 41,184,106**	**$ 25,806,088**	**$ 35,240,342**	**$ 21,146,916**	**$ 19,432,907**	**$ 12,481,917**
Notes:		36,721,912.15	39,404,368.73	25,865,274.82	26,702,707.81	23,902,822.32	21,549,627.16	27,391,780.22	22,448,851.99	13,393,819.19	19,062,761.14	10,339,547.66	9,364,755.62	5,106,408.69
							21,549,627							

Based on reimbursements approved by FEMA in the prior PW submitted following Hurricane Maria, PREPA is not seeking reimbursement for depreciation.

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Anejo A-3(a)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
CITY VIEW PLAZA II BUILDING, 7TH FLOOR
ROUTE 165 GUAYNABO, PUERTO RICO 00968

January 22, 2021

Efran Paredes Maisonet
Acting Executive Director
Puerto Rico Electric Power Authority
P.O. Box 364267
San Juan, PR 00936-4267
Via Electronic Mail – efran.paredes@prepa.com

Re: Notice of Violation and Opportunity to Confer: CAA-02-2021-1302

Dear Eng. Paredes:

The United States Environmental Protection Agency (EPA) issues the enclosed Notice of Violation and Opportunity to Confer (NOVOC) to the Puerto Rico Electric Power Authority (PREPA). EPA has determined that PREPA's Palo Seco Steam Power Plant, located in Toa Baja, Puerto Rico, is in violation of the Clean Air Act, 42 U.S.C. §§ 7401, *et seq.*, its implementing regulations, and Puerto Rico's Regulations for the Control of Atmospheric Pollution.

PREPA may request a conference to discuss the NOVOC. To schedule, please have your legal counsel contact Amanda Prentice, Assistant Regional Counsel, at (212) 637-3209 and/or prentice.amanda@epa.gov, within ten days of receiving this letter and the enclosed NOVOC.

Sincerely,

CARMEN GUERRERO PEREZ
Digitally signed by CARMEN GUERRERO PEREZ
Date: 2021.01.22 07:09:16 -04'00'

Carmen R. Guerrero Pérez
Director
Caribbean Environmental Protection Division

Enclosure: NOVOC

cc: Adam Kushner, Partner
Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, D.C. 20004
adam.kushner@hoganlovells.com

Luis Sierra, Director
Air Quality Area
Puerto Rico Department of Natural and Environmental Resources
LuisSierra@jca.pr.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2

In the Matter of: Puerto Rico Electric Power Authority Palo Seco Steam Power Plant Toa Baja, Puerto Rico, Respondent, In a proceeding under Section 113(a) of the Clean Air Act	NOTICE OF VIOLATION AND OPPORTUNITY TO CONFER CAA-02-2021-1302

The Director of the Caribbean Environmental Protection Division ("Director") for the United States Environmental Protection Agency ("EPA") Region 2 Office issues this Notice of Violation and Opportunity to Confer ("NOVOC") pursuant to Sections 111, 112(d), 113(a)(1), and (a)(3) of the Clean Air Act ("CAA" or the "Act"), 42 U.S.C. §§ 7411, 7412(d); 7413(a)(1), (3). EPA finds that Respondent, Puerto Rico Electric Power Authority ("PREPA" or "Respondent") has violated the Act at its Palo Seco Steam Power Plant as follows:

STATUTORY AND REGULATORY BACKGROUND

Prevention of Significant Deterioration

1. When the Act was passed in 1970, Congress exempted existing facilities from many of its requirements. However, Congress made it clear that this exemption would not last forever. As the United States Court of Appeals for the D.C. Circuit explained in *Alabama Power v. Costle*, 636 F.2d. 323, 400 (D.C. Cir. 1979), "[the] statutory scheme intends to 'grandfather' existing industries; but . . . this is not to constitute a perpetual immunity from all standards under the P[revention of] S[ignificant] D[eterioration] program." Rather, the Act requires grandfathered

facilities to install modern pollution control devices whenever they propose modifications that may increase their emissions.

2. On June 19, 1978, EPA promulgated regulations pursuant to Part C of Title I of the Act, "Prevention of Significant Deterioration of Air Quality" ("PSD"). *See* 43 Fed. Reg. 26403 (June 19, 1978).

3. The PSD provisions of Part C of Title I of the Act establish specific requirements applicable to the construction and modification of sources located in areas designated as either attainment or unclassifiable for purposes of meeting the National Ambient Air Quality Standards ("NAAQS"). *See* 42 U.S.C. §§ 7470-7492. These statutory provisions and their implementing regulations at 40 C.F.R. § 52.21, collectively known as the PSD program, provide that if a major stationary source located in an attainment area is planning to make a major modification, then that source must obtain a PSD permit before beginning actual construction. *See* 40 C.F.R. § 52.21(i). To obtain this permit, the source must, among other things, undergo a technology review and apply Best Available Control Technology ("BACT"); perform a source impact analysis; perform an air quality analysis and modeling; submit appropriate information; and conduct additional impact analyses as required.

4. 40 C.F.R. § 52.21(a)(1) provides that the PSD regulations apply to any State Implementation Plan ("SIP") which has been disapproved with respect to prevention of significant deterioration of air quality in any portion of any state that is in attainment with the applicable NAAQS.

5. Pursuant to Sections 110 and 161 of the Act, EPA (1) disapproved Puerto Rico's prevention of significant deterioration of air quality rules, and (2) incorporated by reference, and made part of the applicable Puerto Rico SIP, the provisions at 40 C.F.R. §§ 52.21(a)(2) through

(w). *See* 40 C.F.R. §§ 52.2720 through 52.2732; 62 Fed. Reg. 3211, 3213 (January 22, 1997); 68 Fed. Reg. 74491 (Dec. 24, 2003); 42 U.S.C. §§ 7410, 7471.

6. 40 C.F.R. § 81.355 establishes the attainment status designations for Puerto Rico, including the 2010 Sulfur Dioxide NAAQS non-attainment designation for the San Juan, Puerto Rico area, which includes the Toa Baja Municipality (specifically, the Palo Seco and Sabana Seca Wards). This area was designated non-attainment for sulfur dioxide (SO_2) on April 9, 2018. *See* 83 Fed. Reg. 1098, 1171 (Jan. 9, 2018).

Non-attainment New Source Review ("NSR")

7. Part D of Title I of the Act, 42 U.S.C. §§ 7501-7515, "Plan Requirements for Non-attainment Areas," sets forth New Source Review ("NSR") provisions for areas classified as non-attainment with the NAAQS. These provisions are referred to herein as the "Non-attainment NSR" program. The Non-attainment NSR program is intended to reduce emissions of air pollutants in areas that have not attained NAAQS so that the areas can make progress towards meeting the NAAQS. Prior to the effective date of the 1990 Clean Air Act Amendments, P. Law 101-549, effective November 15, 1990, the Non-attainment NSR provisions were set forth at 42 U.S.C. §§ 7501-7508.

8. Under Section 172(c)(5) of the Non-attainment NSR provisions of the Act, 42 U.S.C. § 7502(c)(5), each state is required to adopt Non-attainment NSR SIP rules that include provisions to require permits that conform to the requirements of Section 173 of the Act, 42 U.S.C. § 7503, for the construction and operation of modified major stationary sources within non-attainment areas. Section 173 of the Act, in turn, sets forth a series of minimum requirements for the issuance of permits for major modifications to major stationary sources within non-attainment areas. 42 U.S.C. § 7503.

9. Section 173(a) of the Act, 42 U.S.C. § 7503(a), provides that construction and operating permits may be issued, if, *inter alia*, "(a) sufficient offsetting emission reductions have been obtained to reduce

existing emissions to the point where reasonable further progress towards meeting the national ambient air quality standards is maintained; and (b) the pollution controls to be employed will reduce emissions to the lowest achievable emission rate."

10. Under 40 C.F.R. Part 51 Appendix S, "Emission Offset Interpretative Ruling," no person may undertake a major modification of an existing major stationary source in a non-attainment area without first obtaining a Non-attainment NSR permit.

11. Under Appendix S, a "major stationary source" of particulate matter 10 (PM_{10}), nitrogen oxides (NOx), volatile organic compounds (VOCs), carbon monoxide (CO), carbon dioxide-equivalent (CO_2e), and SO_2 is one that emits or has the potential to emit 100 tons per year or more, and a "significant" net emissions increase of these pollutants is one that results in increased emissions of 40 tons per year or more of these pollutants.

<u>New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants</u>

12. Section 111 of the Act authorizes EPA to develop technology-based standards that apply to specific categories of stationary sources. These standards are referred to as the New Source Performance Standards ("NSPS"), which are promulgated under 40 C.F.R. part 60. The Act provides that after the effective date of any emission limit or other standard promulgated pursuant to Section 111, it shall be unlawful for any owner or operator of a new source to operate that source in violation of the emission limit or standard. *See* 42 U.S.C. §§ 7411(e); 7411(h)(5). A "new source" is one that is constructed or modified after the regulations are issued. *See id.* § 7411(a)(2).

13. 40 C.F.R. part 60 subpart KKKK regulates stationary combustion turbines constructed after February 2005 with a heat input at peak load of equal to or greater than 10 million British Thermal Units ("MMBtu") per hour, imposing emission limits on nitrogen oxides NOx and SO_2.

14. Subpart KKKK, at 40 C.F.R. § 60.4333(a), requires a regulated entity to operate and maintain its stationary combustion turbines, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including startup, shutdown, and malfunction.

15. 40 C.F.R. § 60.4335(a) requires regulated entities that choose to use water injection systems to regulate NOx emissions to install, calibrate, and maintain a continuous monitoring system to monitor and record fuel consumption and the ratio of water or steam to fuel used. Alternatively, 40 C.F.R. § 60.4335(b) provides several alternative options for an entity to use continuous emission monitoring.

16. 40 C.F.R. § 60.4340 explains how an entity that is not using water injection may demonstrate continuous compliance for NOx. It requires an entity to perform annual performance tests to demonstrate continuous compliance, or alternatively, install, calibrate, maintain, and operate a continuous monitoring system.

17. 40 C.F.R. part 60 subpart TTTT imposes emission standards and compliance schedules for the control of greenhouse gas emissions ("GHGs") for electric generating units constructed after January 2014 with a base load rating of greater than 250 MMBtu per hour of fossil fuel, and which are capable of selling greater than 25 MW of electricity.

18. Subpart TTTT, at 40 C.F.R. § 60.5525(a), mandates that an entity must be in compliance with the emission standards that apply to its affected electric generating unit ("EGU") at all times.

19. 40 C.F.R. § 60.5525(b) explains that a regulated entity must operate and maintain each affected EGU in a manner consistent with safety and good air pollution control practice at all times.

20. Section 112(d) of the Act requires EPA to promulgate regulations establishing national emission standards for hazardous air pollutants ("NESHAPs") for certain categories of major sources. NESHAPs promulgated under the CAA as amended in 1990 are set forth in 40 C.F.R. part 63. Part 63 NESHAPs

are sometimes known as maximum achievable control technology ("MACT") standards, because Section 112(d) of the CAA, as amended in 1990, directs EPA to promulgate emissions standards based on the MACT. *See* 42 U.S.C. § 7412(d)(2).

21. 40 C.F.R. part 63 subpart YYYY establishes NESHAPs and operating limitations for stationary combustion turbines located at major sources of emissions of hazardous air pollutants. Sources must demonstrate initial and continuous compliance with the emission and operating limitations.

22. 40 C.F.R. § 63.6110 explains when a regulated entity must conduct initial performance tests or other initial compliance demonstrations, and 40 C.F.R. § 63.7 provides performance testing requirements.

23. 40 C.F.R. § 63.6135 explains how a regulated entity must conduct monitoring and collect data to demonstrate continuous compliance.

24. 40 C.F.R. § 63.6140 explains the ways in which a regulated entity may demonstrate continuous compliance with the emission and operating limitations. Table 2 of subpart YYYY provides the relevant operating limitations. Table 5 of subpart YYYY explains that in order to operate a stationary combustion turbine without the use of an oxidation catalyst, a regulated entity must have obtained approval for specific operating limitations through a petition to the EPA Administrator.

Puerto Rico Regulations for the Control of Atmospheric Pollution

25. Puerto Rico Regulations for the Control of Atmospheric Pollution ("RCAP") Rule 201 (Location Approval), no person shall cause, or permit the location or construction of a new major stationary source, or major modification or significant source, without first obtaining a location approval from the Puerto Rico Department of Natural and Environmental Resources ("DNER").

26. RCAP Rule 202 (Air Quality Impact Analysis) describes the circumstances and requirements for an air quality impact analysis, which include a demonstration that allowable emissions increase from a

proposed new source or modification, in conjunction with all other applicable emission increases or reductions, will not significantly cause or contribute to air pollution in violation of any NAAQS, and that a net ambient air quality benefit is demonstrated.

FINDINGS OF FACT

27. Respondent, a public corporation and government instrumentality organized pursuant to the laws of the Commonwealth of Puerto Rico, owns and operates a power generation plant (the "Plant") located at State Road PR-165, Km. 30.8, Toa Baja, Puerto Rico.

28. PREPA is a "person" as defined by Section 302(e) of the CAA, 42 U.S.C. § 7602(e), and the Puerto Rico RCAP Rule 102.

29. PREPA is the "owner" and "operator" of the Plant within the meaning of Puerto Rico RCAP Rule 102.

30. The Plant is an existing major source under the PSD program for NOx, CO, SO_2, PM, PM_{10}, $PM_{2.5}$, VOCs, GHGs, and H_2SO_4.

31. The Plant is located within the San Juan, Puerto Rico SO_2 non-attainment area that was designated on April 9, 2018.

32. On June 18, 2019, PREPA sent a letter to EPA via email (the "June 18 Letter"), proposing to install three new gas turbines of approximately 23 MW capacity each to provide emergency backup generation and maintain reliable service to the island in preparation for the upcoming 2019 hurricane season. PREPA requested EPA's assistance to determine an "appropriate vehicle" to install the units so that they could be ready for use by the beginning of September 2019. PREPA's proposal included the following details about the three new gas turbines:

a. The three gas turbines would be MOBILEPAC®-branded gas turbine packages with FT8®-branded engines, with a capacity of approximately 23 MW each;

b. The MOBILEPAC® gas turbine package ("MobilePacs") would offer 22.5 MW (Fuel Oil) or 23.8 MW (Natural Gas) of movable power;

c. the MobilePacs would be dual-fuel ready, with the capability to use diesel (low-sulfur No. 2 fuel oil) or natural gas as fuel;

d. installation was expected to begin in June 2019, and completed by late August 2019, with normal operation of the MobilePacs expected by early September 2019;

e. the MobilePacs would have emissions controls in the form of water injection to control NOx;

f. while PREPA intended to use the MobilePacs to serve as emergency power during the 2019 hurricane season, it planned to keep the MobilePacs in place at Palo Seco for emergency use and peaking operations, with the objective of having these units replace three existing 21 MW GE Frame 5000 gas turbines in the current Palo Seco power block (Units PS-GT 2-2, 3-1, and 3-2). PREPA reasoned that because they were more efficient, the MobilePacs would be dispatched first, prior to the existing gas turbines in the power block.

33. On June 20, 2019, EPA Region 2's Regional Administrator, Peter D. Lopez, met with PREPA's representatives concerning the proposal contained in the June 18 Letter. In a subsequent telephone call with EPA staff on June 24, 2019, PREPA agreed to supply EPA with the hourly emission rates of the MobilePacs, as well as the load levels, to determine whether it would be possible for PREPA to meet PSD non-applicability conditions for the three proposed units.

34. On October 11, 2019, PREPA sought a 90-day emergency variance from DNER to install the MobilePacs without a DNER construction permit, in order to bolster PREPA's power grid.

35. DNER granted PREPA the 90-day emergency variance on October 24, 2019. The variance allowed PREPA to begin installing the MobilePacs and operate them without a construction permit for a period of 90 days, which expired on January 22, 2020.

36. On January 14, 2020, PREPA submitted a construction permit application to DNER for the MobilePacs, which DNER has not granted.

37. The permit application asserts, and EPA finds, that the MobilePacs are subject to 40 C.F.R. part 60 subpart KKKK, 40 C.F.R. part 60 subpart TTTT, and 40 C.F.R. part 63 subpart YYYY.

38. On January 14, 2020, PREPA also submitted a written no-action assurance ("NAA") request to EPA ("NAA Request") to waive several CAA requirements related to the Plant's MobilePac units, including PSD, NSPS, and NESHAPs requirements.

39. Although EPA granted PREPA an NAA on January 31, 2020, it did not include relief from any violations related to the installation or operation of the MobilePacs.

40. PREPA never installed the water-injection system to control pollution from the MobilePacs, and used only No. 2 diesel fuel oil to operate them.

41. The installation of the MobilePacs constitutes a "physical change" in the method of operation of the Plant, as that phrase is used pursuant to 40 C.F.R. §§ 52.21(b)(2)(i) and (iii).

42. When the MobilePac units were installed, the Plant was an existing major stationary source under 40 C.F.R. § 52.21(b)(1)(i) and 40 C.F.R. part 51, Appendix S, § II(A)(4)(i)(a) because it is a fossil-fuel fired steam electric plant of more than 250 MMBtu per hour heat input, with a potential to emit PM_{10}, NOx, VOC, CO, CO_2e, and SO_2 in excess of 100 tpy.

43. The Plant is also a "major source" of hazardous air pollutant ("HAP") emissions, because it emits or has the potential to emit at least 10 tpy in the aggregate of any HAP, or at least 25 tpy of any combination of HAP. *See* 40 C.F.R. § 63.2.

44. The physical changes PREPA made through the installation and operation of the MobilePacs constitute a "major modification" pursuant to 40 C.F.R. § 52.21(b)(2)(i) and 40 C.F.R. part 51, Appendix S, § II(A)(5)(i)(a).

45. The installation and operation of the MobilePacs resulted in a significant net emissions increase from the Plant, as defined in 40 C.F.R. § 52.21, of NOx, PM, PM_{10}, $PM_{2.5}$, H_2SO_4, and CO_2e, and SO_2 pursuant to 40 C.F.R. part 51, Appendix S, §§ II(A)(5)(i)(a) and (10)(i).

46. PREPA operated at least one of the MobilePacs from November 7, 2019 until August 13, 2020, when it disconnected all three MobilePacs.

VIOLATIONS

47. PREPA emitted NOx, PM, PM_{10}, $PM_{2.5}$, H_2SO_4, and CO_2e in exceedance of PSD applicability thresholds in violation of 40 C.F.R. 52.21(b)(23)(i).

48. PREPA emitted SO_2 in exceedance of non-attainment area NSR applicability thresholds in violation of 40 C.F.R. part 51, Appendix S, § II(A)(10)(i).

49. PREPA is in violation of PSD requirements, Section 165 of the Act, 42 U.S.C. § 7475, and 40 C.F.R. § 52.21, for, among other things, failing to: (1) apply for and obtain a PSD permit to construct and operate the MobilePac units, (2) conduct a BACT analysis, (3) install appropriate emission control equipment in accordance with a BACT analysis, (4) conduct a source impact analysis or an ambient air quality analysis, (5) submit source information, and (6) meet source obligations.

50. PREPA violated non-attainment area NSR requirements, Sections 171 through 193 of the Act, 42 U.S.C. §§ 7501 through 7515, and 40 C.F.R. part 51, Appendix S, Emission Offset Interpretive Ruling, and RCAP Rules 201 and 202, which were approved into the SIP at the time the violations began to occur, by failing to: (1) apply for and obtain a non-attainment area NSR permit to construct and operate the MobilePac units in a non-attainment area for SO_2, (2) implement the lowest achievable emissions

rate ("LAER"), (3) obtain federally enforceable emission offsets for SO_2, (4) submit an analysis demonstrating that the benefits of the MobilePac units significantly outweigh their environmental and social costs, and (5) conduct an air quality impact analysis.

51. PREPA violated the NSPS, 40 C.F.R. part 60 subpart KKKK, because of, *inter alia*, its failure to: (1) employ good air pollution control practices, including failing to install the water injection system or employ a CEMS, in contravention of 40 C.F.R. §§ 60.4333(a) and 60.4335; and (2) demonstrate continuous compliance for NOx emissions in contravention of 40 C.F.R. § 60.4340.

52. PREPA violated the NSPS, 40 C.F.R. part 60 subpart TTTT, by, *inter alia*, failing to: (1) be in compliance with the emission standards at all times, in contravention of 40 C.F.R. § 60.5525(a)(2); and (2) operate the MobilePacs "in a manner consistent with safety and good air pollution control practice," in contravention of 40 C.F.R. § 60.5525(b).

53. PREPA violated the NESHAPs, 40 C.F.R. part 63 subpart YYYY, by failing to, *inter alia*: (1) conduct a performance test or demonstrate initial compliance in contravention of 40 C.F.R. §§ 63.6110 and 63.7; (2) monitor and collect data to demonstrate continuous compliance in contravention of 40 C.F.R. § 63.6135; and (3) demonstrate continuous compliance with the emission and operating limitations in contravention of 40 C.F.R. § 63.6140, Tables 2 and 5.

54. These violations were ongoing through August 13, 2020, when PREPA disconnected the MobilePacs.

ENFORCEMENT AUTHORITY

Section 113(a)(1) of the CAA authorizes EPA to take any of the following actions in response to a respondent's violation(s) of a SIP, after the expiration of 30 days following the issuance of a notice of violation:

- Issue an order requiring compliance with the requirements or prohibitions of the SIP;

- Issue an administrative penalty order in accordance with CAA Section 113(d); or
- bring a civil action in accordance with CAA Section 113(b) for civil penalties and/or injunctive relief.

The amount of civil penalties that may be recovered for violations of the CAA and its implementing regulations is $25,000 per day per violation, but has been adjusted to $101,439 per day for each violation that occurs after November 2, 2015, and where penalties are assessed on or after January 13, 2020. *See* 40 C.F.R. § 19.4.

Furthermore, for any person who knowingly violates any requirement or prohibition of an applicable SIP for more than thirty days after the date of the issuance of an NOVOC, Section 113(c) of the Act provides for criminal penalties or imprisonment, or both. In addition, under Section 306 of the Act, the regulations promulgated thereunder (2 C.F.R. § 1532.1100), and Executive Order 11738, no federal agency may enter into any contract with any person who is convicted of any offense under Section 113(c) of the Act for the procurement of goods, materials, and services to perform such contract at any facility at which the violation which gave rise to such conviction occurred if such facility is owned, leased, or supervised by such person.

PENALTY ASSESSMENT CRITERIA

Section 113(e)(1) of the Act provides that if a penalty is assessed pursuant to Section 113 of the Act, EPA or the court, as appropriate, shall, in determining the amount of the penalty to be assessed, take into consideration the size of the business, the economic impact of the penalty on the business, the violator's full compliance history and good faith efforts to comply, the duration of the violation as established by any credible evidence (including evidence other than the applicable test method), payment by the violator of penalties previously assessed for the same violation, the economic benefit of noncompliance, the seriousness of the violation, and other factors as justice may require.

Section 113(e)(2) of the Act allows EPA or the court, as appropriate, to assess a penalty for each day of violation. In accordance with Section 113(e)(2) of the Act, EPA will consider a violation to continue from the date the violation began until the date Respondent establishes that it has achieved continuous compliance. If Respondent proves that there was an intermittent day of compliance or that the violation was not continuous in nature, EPA will reduce the penalty accordingly.

OPPORTUNITY FOR A CONFERENCE

Respondent may request a video conference with EPA concerning the violations alleged in this NOVOC. This conference will enable Respondent to present evidence regarding the findings of violation, the nature of the violation, and any efforts it may have taken, or it proposes to take, to achieve compliance. Respondent's request for a conference must be confirmed in writing within ten days of receipt of this NOVOC. The request for a conference, or other inquiries concerning this NOVOC, should be made by email to Amanda Prentice, Assistant Regional Counsel, at prentice.amanda@epa.gov.

Notwithstanding this NOVOC and the opportunity for conference, Respondent must comply with all applicable requirements of the CAA.

Date: January 22, 2021

CARMEN GUERRERO PEREZ

Digitally signed by CARMEN GUERRERO PEREZ
Date: 2021.01.22 07:04:13 -04'00'

Carmen R. Guerrero
Director
Caribbean Environmental Protection Division
U.S. Environmental Protection Agency - Region 2

To: Eng. Efran Paredes Maisonet, Acting Executive Director

Puerto Rico Electric and Power Authority

Efran.Paredes@prepa.com

cc: Eng. Luis Sierra, Air Quality Area Manager

Puerto Rico Department of Natural and Environmental Resources

luissierra@jca.pr.gov

Luisette Rios, PREPA Environmental Protection and Quality Assurance Division,

Luisette.Ríos@prepa.com

Maria Mercado, PREPA Environmental Protection and Quality Assurance Division,

Maria.Mercado@prepa.com

Jose Santos, PREPA Environmental Protection and Quality Assurance Division,

Jose.Santos@prepa.com

Hogan Lovells

Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004
T +1 202 637 5600
F +1 202 637 5910
www.hoganlovells.com

October 8, 2020

By Electronic Mail

Liliana Villatora
Air Branch Chief, Office of Regional Counsel
U.S. Environmental Protection Agency – Region 2
Ted Weiss Federal Building
290 Broadway
New York, NY 10007
villatora.liliana@epa.gov

**Re: Puerto Rico Electric Power Authority —
Response to U.S. Environmental Protection Agency Requests for Information**

Dear Ms. Villatora:

On July 29, 2020, the Puerto Rico Electric Power Authority ("PREPA") and the United States Environmental Protection Agency ("EPA") participated in a telephone conference to discuss the 1999 consent decree ("CD"), Mercury and Air Toxics Standard ("MATS") compliance, the Palo Seco MobilePac units, the conversion of San Juan Units 5-6, and the No Action Assurances ("NAA") issued by EPA in response to the January 2020 earthquakes. On August 6, 2020, via electronic mail, EPA subsequently provided a list of specific information requests to counsel for PREPA.

I write on behalf of PREPA to provide the following responses to EPA's information requests. Below, we have copied the specific requests made by EPA, and provide a response to each request, or otherwise note that PREPA will supplement this response once the requested information becomes available.

PREPA's responses to EPA's requests are made to the best of PREPA's knowledge as of the date of this letter. However, several of PREPA's responses involve date estimates for when various projects and repairs will be completed, and delays may occur for various reasons, including the COVID-19 pandemic.

<u>Follow-Up Questions from July 29, 2020 Telephone Conference:</u>

1. **Please provide a summary (or a copy of the test report) of when PREPA performed the last two annual NOx tests to demonstrate that it is meeting the NOx baseline numbers at Palo Seco, Aguirre, and Costa Sur; explain why PREPA could not complete the tests where applicable; and provide a schedule for when the tests will be completed.**

   PREPA Response:

   In the table below, PREPA identifies the dates of the last two annual NOx tests for each power plant, as well as the current schedule for completing the NOx tests for 2020:

Plant / Unit	Date of Most Recent NOx Test	Date of Penultimate NOx Test	Current Schedule for 2020 NOx Tests
Costa Sur Unit 5	August 18-19, 2016	March 1, 2015	Week of Oct. 13, 2020
Costa Sur Unit 6	March 14, 2017	September 7-8, 2016	N/A (Out-of-Service)[1]
Aguirre Unit 1	March 20, 23-24, 2017	December 7, 2016	Week of Oct. 5, 2020
Aguirre Unit 2	March 28, 2017*	April 7-9, 2015	Week of Oct. 5, 2020
Palo Seco Unit 1	April 21, 2016	December 21-22, 2015	N/A (Out-of-Service)[2]
Palo Seco Unit 2	April 20, 2016	January 28-29, 2015	N/A (Out-of-Service)
Palo Seco Unit 3	August 9, 2016	December 9, 2015	Environmental Outage[3]
Palo Seco Unit 4	Jan. 26, 2015	April 25, 2013	Week of Oct. 19, 2020
Note: *Aguirre Unit 2 was tested on this date; however, the testing was only conducted at 75% load because the unit tripped.			

PREPA is submitting the available reports to EPA via secure file transfer.

PREPA has experienced various delays in completing the NOx testing beginning in 2017-2018 with Hurricanes Irma and Maria, which struck in September 2017. In October 2017, following the hurricanes, PREPA claimed *force majeure* under the 1999 Consent Decree with regards to the NOx testing requirement. As recognized by EPA in granting PREPA a series of no-action assurances extending into the summer of 2018, it took nearly a year to restore PREPA's core infrastructure. Even following completion of much of the repair work, PREPA faced a very large backlog of testing and reporting requirements further complicated by a cyberattack on PREPA's system. In 2019 and beyond, these challenges were compounded by difficulties in securing a contractor to conduct the required testing. In 2020, PREPA has experienced additional challenges, including catastrophic earthquakes that rendered inoperable the Costa Sur Power Plant units. As noted below, Costa Sur Unit 5 just recently

[1] Costa Sur Unit 6 is currently expected to return to service by approximately December 18, 2020.
[2] Palo Seco Unit 1 has been out-of-service since August 1, 2020 due to a generator failure, and is not expected to return to service until next year.
[3] Palo Seco Unit 3 was taken out-of-service as of September 19, 2020 for a mandatory environmental outage, and is expect to be out-of-service for approximately 3 months.

came back online in August 2020. Costa Sur Unit 6 is currently anticipated to return to service by approximately December 18, 2020.

PREPA's other units have also experienced outages and limitations that have prevented NOx testing from being conducted in certain years. For instance, Aguirre Unit 2 was out-of-service during 2016, and was again out-of-service for over a year for the majority of 2019 and into 2020. And in 2018, both of the Aguirre Units were able to operate only at limited loads for much of the year due to the hurricanes.

The Palo Seco units have also experienced significant outages since 2017 that have prevented or complicated the scheduling of NOx testing. As EPA may recall, even prior to the hurricanes, Palo Seco experienced structural issues and the units were taken out-of-service for a period of time. Following the hurricanes, PREPA worked to bring the various units back online to meet demand, but with the exception of Palo Seco 3, the units have experienced significant mechanical issues and forced outages in recent years. Palo Seco Unit 4 was also out-of-service in 2016, which explains why NOx testing was not conducted in that year for that unit.

2. **As we discussed, the 1999 Consent Decree requires written notification of stipulated penalties paid. We understand that on July 28, 2020, Hector Velez provided Maria Mercado with a list of names of individuals at EPA and their email addresses who should receive electronic notifications of the stipulated penalties paid by PREPA. Thank you for submitting copies of these notices from 2017 through the end of the first quarter of 2020 via secure file transfer.**

PREPA Response:

As noted above, on August 4, 2020, PREPA sent copies of the stipulated penalty payments from 2017 to Q1 2020 via Hogan Lovells' secure file transfer system. Attached to this response as Appendix A, PREPA is also providing a copy of this information for Q2 2020.

3. **Please provide the results of the two most recent particulate matter ("PM") stack tests conducted for Aguirre 1 and 2. Please specify the dates when the next PM stack testing will be conducted for each of these units.**

PREPA Response:

In the table below, PREPA has identified the dates the two most recent PM stack tests were performed, as well as the tentative schedule for the next PM tests:

Power Plant / Units	Date of Most Recent PM Test	Date of Penultimate PM Test	Tentative Schedule for Next PM Test
Aguirre Unit 1	April 9, 2019	Nov. 26, 2018	Week of Oct. 5, 2020
Aguirre Unit 2	Nov. 14, 2018	—	Week of Oct. 5, 2020

PREPA is providing the following reports:

- Montrose Air Quality Services, Source Test Report: 2018 MATS Particulate Test Program, PREPA Aguirre Unit 1, Document No. 023AS-520172-RT-325 (report dated Feb. 11, 2019) (testing conducted on Nov. 26, 2018).

- Montrose Air Quality Services, Source Test Report: 2019 MATS Particulate Test Program, PREPA Aguirre Unit 1, Document No. 023AS-578060-RT-325 (report dated July 2, 2019) (testing conducted on April 9, 2019).

- Montrose Air Quality Services, Source Test Report: 2018 MATS Particulate Test Program, PREPA Aguirre Unit 2, Document No. 023AS-520172-RT-313 (report dated Jan. 2, 2019) (testing conducted Nov. 14, 2018).

These reports are being provided via secure file transfer to EPA.

4. Thank you for sending the MATS reports that were or should have been sent to CEDRI from the second half of 2017. Please upload these reports to CEDRI as well

PREPA Response:

As acknowledged by EPA, by email dated August 4, 2020, PREPA submitted the following reports to EPA utilizing Hogan Lovells' secure file transfer system:

- MATS quarterly reports for the San Juan Power Plant from Q3 2017 to Q1 2020.
- MATS quarterly reports for the Costa Sur power plant from Q3 2017 to Q3 2019.

As PREPA explained via email on August 12, 2020, Palo Seco Units 3 and 4 have PM CEMS; however, PREPA recently experienced a server failure at the Palo Seco Power Plant that caused the CEMS data to be unavailable. PREPA has been working with the CEMS manufacturer to recover the relevant information, but unfortunately was unable to recover the data. Attached to this response as Appendix B, PREPA is providing the report from the manufacturer documenting the situation.

PREPA is actively trouble-shooting technical and firewall issues that are posing a hurdle to uploading the reports to EPA's website online, and has contacted EPA for technical assistance. PREPA will upload the MATS reports once these technical issues are resolved. However, it is PREPA's understanding that these reports should now be uploaded to EPA's Emissions Collection and Monitoring Plan System ("ECMPS") Client Tool, rather than CEDRI. *See* Mercury and Air Toxics Standards for Power Plants Electronic Reporting Revisions, 85 Fed. Reg. 55,744 (Sept. 9, 2020).

5. **For the MATS-affected generating units, please provide a long-term schedule, with interim measures, of when PREPA expects these units will be in compliance with MATS. For non-MATS affected generating units, please confirm that these units will be in compliance with their permits and that a compliance order will not be required after the NAA has expired.**

   PREPA Response:

   For the MATS-affected generating units, PREPA is in the process of developing a proposed compliance schedule, and will supplement this response once it has completed its evaluation. PREPA's development of a long-term schedule is interrelated with its Integrated Resource Plan ("IRP"). On August 24, 2020, the Puerto Rico Energy Bureau ("PREB") issued its final resolution and order on the IRP, approving in part and disapproving in part PREPA's proposed IRP. PREPA did not seek reconsideration of PREB's order. PREPA is still analyzing the implications of that order on its generation fleet, and what it means for the timing of retirements of existing units and potential replacement generation resources. However, PREPA anticipates that the retirement schedule will largely be tied to the availability of new renewable generation resources. Once PREPA has completed its analysis of PREB's order, PREPA will develop its compliance plan and provide this information to EPA.

   PREPA expects to comply with the permits for the non-MATS affected generating units covered by the NAA.

6. **Please notify EPA when PREPA resumes use of liquefied natural gas at Costa Sur 5.**

   PREPA Response:

   PREPA resumed use of natural gas with startup testing of Costa Sur Unit 5 on July 27, 2020.

7. **Please confirm that Costa Sur 5 is operating by August 14, 2020, as you anticipated, or provide the new expected start date.**

   PREPA Response:

   On July 27, 2020, PREPA began startup testing of Costa Sur Unit 5. On August 1, 2020, the unit was returned to service for a shakedown period and was synchronized to the grid. The first week of August the unit was tested at 200 MW, and the second week of August the unit was tested at 300 MW. PREPA completed shakedown of the unit on August 14, 2020, and the unit was operational after that time.

8. **As required by the NAA, and as you indicated you would do, please provide the requisite notice that Aguirre 2 came back into service as of May 6, 2020.**

PREPA Response:

Aguirre Unit 2 was synced to PREPA's system with acceptable vibration levels and came back into service as of May 6, 2020. Subsequently, at various points in May 2020, Aguirre Unit 2 was taken out of service or operated at limited loads to rectify various mechanical issues, including wiring faults, boiler breaks, and air preheater issues, among other things. On August 4, 2020, via electronic mail, PREPA provided a report (entitled "Informe de Limitaciones, Fallas, y Roturas Unidad 2 Central Aguirre," dated May 17, 2020), describing the timeline for Aguirre Unit 2 coming back to service and the subsequent mechanical issues encountered by Unit 2 in the weeks following its return to service. PREPA is reattaching this report with this response as Appendix C.

9. **We are in the process of reviewing the information you submitted on August 4 concerning MATS emission data in response to the questions posed in Mary McHale's June 1, 2020 email. We will follow-up as needed if we have further questions.**

PREPA Response:

In PREPA's August 4, 2020 submission, PREPA indicated that it would supplement the MATS emissions data it provided to EPA with updated emissions factors for Palo Seco Units 3-4 if PREPA was able to recover the CEMS data for those units that had been rendered unavailable by the server failure that occurred at Palo Seco. Since then PREPA has been working with the CEMS manufacturer to recover the relevant information, but unfortunately was unable to recover the data. Attached to this response as Appendix B, PREPA is providing the report from the manufacturer documenting the situation.

10. **As requested in the June 1, 2020 email message to you from Mary McHale, please provide the clarification on three items from the written Force Majeure notice submitted by PREPA on April 8, 2020:**

a. **Bulleted item 1 of category 1 includes Costa Sur Units 5 and 6, which we understand ceased operation on January 7, 2020, and have not resumed operation. We therefore seek clarification of the timeframe for relief sought in item 1 as it relates to Costa Sur 5 and 6.**

PREPA Response:

For Category 1, Item 1 (opacity deviations), PREPA no longer seeks *force majeure* relief for Costa Sur Units 5-6. At the time that PREPA submitted its supplemental *force majeure* notice on April 8, 2020, PREPA understood that there may have been opacity deviations at Costa Sur on January 7, 2020. However, PREPA has since received information that no opacity deviations occurred at Costa Sur. Accordingly, PREPA no longer seeks *force majeure* relief for this item for Costa Sur Units 5-6.

b. Bulleted items 2-5 of category 1 concern "generating units subject to the Consent Decree." Since we understand that the Costa Sur facility ceased operation on January 7, 2020, and has not resumed operation, we seek clarification of the timeframe for relief sought in items 2-5 as they relate to Costa Sur.

PREPA Response:

EPA is correct that Costa Sur ceased operation on January 7, 2020. For Costa Sur, PREPA had originally sought relief for potential noncompliance to the extent it did not complete required actions under the Consent Decree on or before January 7, 2020. However, PREPA has since received information that no non-compliance with these requirements was reported for Costa Sur. PREPA no longer seeks *force majeure* relief for this item for Costa Sur Units 5-6.

c. Bulleted items 2-5 of category 1 state that PREPA "potentially did not fully comply with various operation and preventative maintenance requirements under the Consent Decree that were required to be conducted on a frequent basis" and identify the specific Consent Decree provisions for which force majeure is claimed. Please clarify whether items 2-5 concern "potential violations" or if PREPA has identified violations of each of these Consent Decree requirements for the generating units in operation, and provide any documentation regarding the instances of non-compliance and the claim that such non-compliance was attributable to the force majeure event.

PREPA Response:

As described in its supplemental *force majeure* notice, PREPA has identified noncompliance with the telemetry requirements under the Consent Decree, as the telemetry system was out of service due to the blackouts caused by the earthquakes on January 7, 2020 for Costa Sur, and January 7-8, 2020 for Palo Seco, San Juan, and Aguirre.

The rest of the identified items were "potential" noncompliance. At this time, PREPA has not identified additional noncompliance with the operation and preventative maintenance requirements in Category 1, Items 2-5.

11. **Please clarify the extent to which the Title III process will provide PREPA with funding to comply with environmental laws, as you indicated, or explain any hurdles you expect as a result of the Title III process in obtaining funding for environmental compliance.**

    PREPA Response:

    PREPA is a covered entity under the Puerto Rico Oversight, Management, and Economic Stability Act ("PROMESA"). As such, the Title III process provides for PREPA to operate under a Fiscal Oversight Board Certified Budget and Certified Fiscal Plan. The Fiscal Plan serves as PREPA's business plan. Annually, PREPA submits a budget allowing it to comply with the strategies included in the Fiscal Plan, while providing its customers with reliable energy service within the bounds of projected revenue and expenses.

    If PREPA requires funds for new compliance projects or capital expenditures, PREPA submits a budget and plan for such projects, as long as these compliance projects are within the framework of the Fiscal Plan, which is generally in accordance with the IRP and other strategic documents within the regulatory framework. As an example, the current budget has an environmental compliance account with resources allocated to cover expenses associated with this topic. If expenditures surpass the current budget, PREPA must identify and transfer funds from operational accounts in order to fulfill any budget overdrafts.

    Note that the information provided above is intended to provide a general overview as to the approval process, as non-budgetary funds have yet been proposed or approved for future specific compliance expenditures.

Palo Seco MobilePac Additional Questions

12. **For each of the Palo Seco MobilePac units, please provide the actual hours of operation, the actual fuel usage, and fuel type for the complete months of May, June, and July 2020.**

    PREPA Response:

    Below, PREPA provides the requested data for the three Palo Seco MobilePac units from November 2019 to August 2020. PREPA notes that the MobilePac units were taken out-of-service on August 13, 2020. Barring an emergency situation, PREPA intends for these units to remain out-of-service until water injection controls are operational and the Puerto Rico Department of Natural and Environmental Resources ("DNER") issues a permit to construct.

PALO SECO TURBINES FT-8 MOBILEPACS - FUEL USAGE

PSMP-1			
MONTH & YEAR	FUEL USE (bbls) *	SULFUR (%/wt)	HOUS OF OPERATION
Nov-2019	721.7	0.033	28.7
Dec-2019	443.8	0.033	6.5
Jan-2020	19,972.2	0.032	545.0
Feb-2020	23,128.1	0.028	602.0
Mar-2020	26,801.7	0.014	740.7
Apr-2020	18,295.0	0.006	719.5
May-2020	23,473.2	0.015	675.0
Jun-2020	26,879.0	0.011	665.6
Jul-2020	27,437.0	0.012	731.2
Aug-2020	11,000.2	0.011	291.8

PSMP-2			
MONTH & YEAR	FUEL USE (bbls) *	SULFUR (%/wt)	HOUS OF OPERATION
Nov-2019	736.5	0.033	32.3
Dec-2019	564.8	0.033	9.4
Jan-2020	19,194.1	0.032	524.0
Feb-2020	25,100.7	0.028	656.0
Mar-2020	27,814.2	0.014	710.4
Apr-2020	18,326.6	0.006	709.5
May-2020	25,889.1	0.014	716.0
Jun-2020	26,184.4	0.011	688.6
Jul-2020	21,361.7	0.012	575.4
Aug-2020	10,752.1	0.011	309.3

PSMP-3			
MONTH & YEAR	FUEL USE (bbls) *	SULFUR (%/wt)	HOUS OF OPERATION
Nov-2019	556.76	0.033	27.4
Dec-2019	531.21	0.033	8.2
Jan-2020	18,046.85	0.032	480.0
Feb-2020	26,570.88	0.028	688.0
Mar-2020	27,936.34	0.014	738.8
Apr-2020	17,527.55	0.006	681.1
May-2020	26,102.21	0.014	744.0
Jun-2020	26,866.65	0.011	677.9
Jul-2020	26,866.7	0.012	713.1
Aug-2020	8,193.6	0.011	281.3

*** No. 2 FUEL OIL - DIESEL**

13. **Please provide a written description of the issues that PREPA is having with the demineralized water and the holding tank, and how this is affecting the water injection system. Please provide a schedule with interim milestones for when these issues will be addressed, and the water injection will be operational. Also, please provide the date when the construction of the water piping delivery system to the MobilePac units was completed. If it has not been completed, please explain the cause of the delay and the expected date of completion.**

PREPA Response:

In April 2020, PREPA began the project to install a system of pumps and pipes for the injection of demineralized water ("demi water") from Palo Seco demi water tanks 1 to 4 to the three Palo Seco MobilePac units. The project was completed in June 2020. However, at the end of June 2020, PREPA took water samples and discovered that the water quality results were out of tolerance with the OEM requirements for the Palo Seco MobilePac turbines.[4] After sampling at different points in the demineralization process, PREPA found that the water tanks were the source of the problem, and that demi water was mixing with condensate water. PREPA evaluated alternatives to address this issue, and has developed an action plan for two solutions, one of which is a temporary, interim solution, and the other which provides a longer-term, more permanent solution:

Temporary Connection:

- Empty tank D-2 for internal cleaning and flushing.
- Isolate tank D-2, and align it for exclusive use of the Palo Seco MobilePac units.
- Install a two-stage water filtration system to obtain filtered water with solids not more than 5 ppm. Filtration system to be installed between the skid of pumps and MobilePac turbines.

Permanent Connection:

Use tank D-4 for exclusive use of the Palo Seco MobilePacs. PREPA will need to rehabilitate tank D-4 by emptying the tank, conducting an internal inspection, replacing the floor, and applying a new internal coating. Lead-containing paint was located in the tank staircase and needs to be removed before the rehabilitation can begin.

For the Temporary Connection, PREPA has completed the project site assessment, tank D-2 inspection and cleaning, and the design and equipment specifications. PREPA is currently in the midst of the procurement process. For the Permanent Connection, PREPA has completed the project site assessment, tank D-4 inspection, and the design/specifications for the tank D-4 rehabilitation. PREPA is currently in the midst of the procurement process.

PREPA is in the process of updating the schedule for the completion of the work described above, and will provide further information to EPA when it becomes available. PREPA notes that the MobilePac units were taken out-of-service on August 13, 2020. Barring an emergency situation, PREPA intends for these units to remain out-of-service until water injection controls are operational and DNER issues a permit to construct.

[4] In January 2019, quality of the demi water produced at the Palo Seco Power Plant had been evaluated and PREPA had found that, at that time, it met the minimum water quality requirements of the OEM of the MobilePac turbines.

San Juan Units 5 and 6 Additional Questions

14. You indicated that San Juan Units 5 and 6 were modified to allow dual-fuel capacity on April 6, 2020 (Unit 5) and April 14, 2020 (Unit 6), and your August 4 email provided copies of the notifications to DNER. Please provide the date(s) on which construction commenced on the burner conversion for Units 5 and 6.

PREPA Response:

The timeline for the San Juan Unit 5 conversion is as follows:

October 10, 2019: San Juan Unit 5 Conversion Start
December 23, 2019: San Juan Unit 5 Cold Testing Completion (Mechanical Conversion)
April 6, 2020 to April 15, 2020: San Juan Unit 5 Natural Gas Commissioning

The timeline for the San Juan Unit 6 conversion is as follows:

March 1, 2020: San Juan Unit 6 Conversion Start
April 14, 2020 to April 25, 2020: San Juan Unit 6 Natural Gas Commissioning

15. Please provide the actual fuel type and amount of fuel burned on a monthly basis for Units 5 and 6 since the burner conversions were completed on each unit.

PREPA Response:

Below, PREPA provides the requested data for San Juan Units 5 and 6 from April 6, 2020 through August 2020.

SAN JUAN TURBINES - FUEL USAGE

SJ 5

MONTH & YEAR	FUEL USE (bbls)	SULFUR (%/wt)	HOUS OF OPERATION FUEL OIL No.2	NATURAL GAS (BTU)	NATURAL GAS (Scf)	SULFUR (gr/100dscf)	HOUS OF OPERATION NATURAL GAS
Apr-2020	42,389.5	0.014	150.0	640,545,313,759.0	621,647,237.7	0.01819	336.8
May-2020	158,953.6	0.020	663.4	85,990,000,000.0	83,453,028.0	0.01819	56.0
Jun-2020	159,669.1	0.017	646.8	38,945,569,788.0	37,796,554.5	0.01819	23.1
Jul-2020	72,175.2	0.015	284.8	617,809,217,104.0	599,058,680.4	0.01365	413.0
Aug-2020	61,660.2	0.014	258.6	708,143,286,292.0	686,384,885.4	0.01365	483.0

SJ 6

MONTH & YEAR	FUEL USE (bbls)	SULFUR (%/wt)	HOUS OF OPERATION FUEL OIL No.2	NATURAL GAS (BTU)	NATURAL GAS (Scf)	SULFUR (gr/100dscf)	HOUS OF OPERATION NATURAL GAS
Apr-2020	8,613.7	0.014	45.0	130,161,825.4	126,321.6	0.01819	80.0
May-2020	81,427.1	0.020	370.0	450,277,000,000.0	436,992,430.1	0.01819	325.5
Jun-2020	66,625.7	0.017	310.3	518,145,524,700.0	502,858,622.6	0.01819	397.0
Jul-2020	22,088.2	0.015	97.6	848,331,486,280.0	822,584,588.7	0.01365	631.0
Aug-2020	53,815.1	0.014	219.7	608,731,166,440.0	590,027,301.0	0.01365	441.0

16. **You indicated that PREPA expects to install the SCR/OxCat controls on Unit 5 by October 2020. Please continue to provide EPA Region 2 with updates regarding this schedule, particularly if it is delayed.**

PREPA Response:

The schedule for the installation of the SCR/OxCat controls on Unit 5 is delayed, as the contractor (New Fortress Energy or "NFE") has claimed *force majeure* under its contract with PREPA, citing the COVID-19 pandemic, the need to change SCR vendors, and supplier delays related to the pandemic. Based on the most recent information received from NFE, the SCR equipment necessary to begin the installation is slated to clear customs by February 12, 2021. PREPA is attaching the most recent schedule provided by NFE as Appendix D.

The outage to install the controls is currently programmed to start on January 23, 2021, which allows PREPA and the contractor time to conduct preparatory work for the installation before the SCR arrives. Based on current information regarding the installation schedule, performance testing would run from late April 2021 to early to mid-May 2021, and commercial operation of the Unit with SCR installed would occur by mid-May.

PREPA notes that it is actively pressing NFE to minimize delay and accelerate this schedule, and has sought additional detailed information on the exact nature of NFE's claims and the reason for delay. PREPA will provide EPA and DNER with additional details and updates as it collects additional information from New Fortress Energy.

17. **The October 3, 2019 DNER permit for Units 5 and 6 requires PREPA to install the SCR/OxCat no later than six months from the date natural gas burning begins. Does PREPA expect to meet this requirement? If not, please explain.**

PREPA Response:

Please see response to Request No. 16. As noted above, the contractor responsible for installing the SCR/OxCat controls is experiencing delays and has claimed *force majeure* under its contract with PREPA. As a result, the outage to install the controls is not expected to start until January 23, 2021. PREPA is pressing NFE to advance this schedule.

18. **Due to the current operational requirements for San Juan Units 5 and 6 caused by the ongoing power emergency in Puerto Rico, does PREPA expect to meet for the upcoming 365-day rolling periods the various 365-day rolling PSD non-applicability emission limits incorporated into its DNER permit as a result of the addition of the natural gas capability? Please explain.**

    PREPA Response:

    Even with the currently expected delay in the installation of the SCR, as described above, PREPA expects to meet the rolling 365-day emission limits incorporated into its Puerto Rico DNER construction permit for San Juan Units 5 and 6. If emissions from Units 5-6 approach the emission limits, PREPA plans to proactively manage its emissions in order to stay below the 365-day emission limits, as required by DNER's construction permit.

19. **Please provide the approximate date that PREPA expects to exceed the 15,000 hr/365-day limit on the combined Units 5 and 6 that is currently in the PSD permit.**

    PREPA Response:

    To the best of PREPA's current knowledge, PREPA estimates that San Juan Units 5 and 6 will not reach the 15,000 hour rolling annual limit in the near future. PREPA's historical and projected operating hours for these units are attached hereto as Appendix E. The operating hours are projected through mid-June 2021, and indicate that PREPA will not reach the 15,000 hour limit in that timeframe. The hours projections are based on the current outage schedules for the two units, including the timeline provided by NFE for installation of the SCR/OxCat at Unit 5, as well as an outage for maintenance at Unit 6 currently scheduled for November 2020.

    That said, it is PREPA's understanding that EPA agreed to modify PREPA's PSD permit to remove the 15,000 hour limit and to replace it with the 365-day rolling emissions limits that were incorporated into the October 3, 2019 construction permit issued by DNER. EPA's July 19, 2019 response to PREPA's PSD non-applicability analysis provided a list of conditions and stated that "[a]ssuming PREPA chooses to incorporate the attached conditions into its PRDNER construction permits, EPA will revise PREPA's existing San Juan PSD permit under a separate action to conform to the new source configuration and PRDNER permit conditions. We will also incorporate the requested new potential-to-emit limits and remove the combined annual operating limit of 15,000 hours."

    Section XIV of DNER's October 3, 2019 construction permit for Units 5 and 6 incorporated the conditions from EPA's July 19, 2019 response to the PSD non-applicability analysis. Condition 5 provides that there shall be no restrictions in the hours of operations for Units 5 and 6 as long as these units comply with the annual emissions limits delineated in Condition 6 of the permit. As described in response to Request No. 18 above, PREPA plans to proactively manage its emissions to meet these annual emissions limits.

Please let us know if you have any questions regarding the above responses or require additional information.

Respectfully submitted,

Adam M. Kushner
Partner
adam.kushner@hoganlovells.com
D +1 202 637 5724

Cc: Mr. Eric Schaaf, U.S. EPA Region 2
Ms. Mary McHale, U.S. EPA Region 2
Ms. Sara Froikin, U.S. EPA Region 2
Mr. Hector Velez, U.S. EPA Region 2
Mr. Harish Patel, U.S. EPA Region 2
Ms. Amanda Prentice, U.S. EPA Region 2
Mr. Gregory Fried, Chief, Stationary Source Enforcement Branch, U.S. EPA
Mr. Steven Keller, U.S. Department of Justice, Environmental Enforcement Section
Mr. Luis Sierra, Puerto Rico Department of Natural and Environmental Resources

Appendix A:

Consent Decree Stipulated Penalties for Q2 2020

GOVERNMENT OF PUERTO RICO
Puerto Rico Electric Power Authority

August 25, 2020

CERTIFIED MAIL 7010 0290 0002 7602 0976

Mr. W. Stephen Muldrow
US Attorney
District of Puerto Rico
Torre Chardón, Suite 1201
350 Carlos Chardón Avenue
San Juan, Puerto Rico 00918

Dear Mrs. Stephen Muldrow:

PREPA No. 93-2527
DOJ Case No. 90-5-2-1-1750

Enclosed is a copy of the transfer fund payment for the stipulated penalties agreed upon and contained in the Consent Decree, between the Puerto Rico Electric Power Authority (PREPA) and the United States entered into on March 19, 1999 in the above referenced case. The enclosed payment is for the second quarter (April to June) of 2020.

This payment was made pursuant the February 9, 2017, US Department of Justice letter. Copy of this document has been sent by email to the EPA officials listed below.

Should you require additional information, please contact us at (787) 521-4960.

Cordially,

Luisette X. Ríos-Castañer, Head
Environmental Protection and
Quality Assurance Division

Enclosures

c Milton Wise
Keller, Steve
Mark Gallagher
Carmen Guerrero
Alex Rivera
Robert Buettner
Nancy Rodríguez
Héctor Vélez
Eric Schaaf
Harish Patel

Payment 10010698 Details

Preformat Code	118-M
Debit Account Number / Currency / Name	0400015015 - USD - PR ELECTRIC POWER AUTHORITY
Payment Currency / Amount	USD - 14,187.50
Payment Method	Funds Transfer
Payment Type	--
Subsidiary Identifier / Name	-- - --
Transaction Reference Number	10010698
Confidential	No
Beneficiary Reference	10010698
Intra-Company	No
Number of Credit Parties	2 Credit Party Transfer
Ordering Party Name / Address	PUERTO RICO ELECTRIC POWER AUTH. PR
Ordering Party ID Type / ID	/ACCT/ - 0400015015
Value Date	08/21/2020
Priority Flag	No
Beneficiary Account or Other ID Type / ID	/ACCT/ - 15030001
Beneficiary Is	Not a Bank
Beneficiary Name / Address	UNITED STATES DEPARTMENT OF JUSTICE
Beneficiary Advice Type	NONE
Charges Indicator	Our
Beneficiary Bank Routing Method / Code	FEDWIRE ROUTING NUMBER - 021030004
Beneficiary Bank Account or Other ID Type / ID	-
Beneficiary Bank Name / Address	TREAS NYC/FUNDS TRANSFER DIVISION NEW YORK NY UNITED STATES
Beneficiary Bank Advice Type	--
First Intermediary Bank Routing Method / Code	-
First Intermediary Bank Name / Address	--
Second Intermediary Bank Account or Other ID Type / ID	-
Second Intermediary Bank Advice Type	--
Second Intermediary Bank Name / Address	--
Pre-Advice	No
Pre-Advice Details	--
Payment Details	USAO/PR INV. 20-08-CM-012 TRIMESTRE ABRIL-JUNIO 2020
Bank Details	--
Memo Details	CDCS-2013A54801 INV.
Submitted By	MARIEOLGA ANGLERO
Submission Date/Time	08/21/2020, 14:21:53 GMT-04:00
Cheque Number	--
Status	CB Accepted
Sub-Status	--
Creation Method	Editable Template Preformat

Directorado Sistema Eléctrico
División Ingeniería y Servicios Técnicos Centrales Generatrices

Computos por Penalidades Estipuladas - Acuerdo por Consentimiento

AÑO 2020

Central	Aire ABRIL	Número Desviaciones	Aire MAYO	Número Desviaciones	Aire JUNIO	Número Desviaciones	TOTALES 2do Trimestre	Total Desviaciones
San Juan	$300.00	3	$2,400.00	24	$3,700.00	31	$8,400.00	58
Palo Seco	3,200.00	32	2,900.00	29	2,300.00	23	$8,400.00	84
Costa Sur	0.00	0	0.00	0	0.00	0	$0.00	0
Aguirre	1,300.00	13	3,200.00	26	200.00	2	$4,700.00	41
Total Aire	$4,800.00		$8,500.00		$6,200.00		$19,500.00	
Acogidos al 50%	$2,400.00		$4,250.00		$3,100.00		$9,750.00	50%

Central	Agua ABRIL	Desviaciones	Agua MAYO	Desviaciones	Agua JUNIO	Desviaciones	TOTALES 2do Trimestre	Desviaciones
San Juan	$0.00	0	$1,350.00	3	$1,050.00	2	$2,400.00	5
Palo Seco	450.00	1	625.00	1	450.00	1	$1,525.00	3
Costa Sur	0.00	0	0.00	0	0.00	0	$0.00	0
Aguirre	1,350.00	3	2,250.00	5	1,350.00	3	$4,950.00	11
Total Agua	$1,800.00		$4,225.00		$2,850.00		$8,875.00	
Acogidos al 50%	$900.00		$2,112.50		$1,425.00		$4,437.50	50%

	ABRIL	MAYO	JUNIO	2do Trimestre	
Gran Total a pagar: (Agua + Aire-100%)	$6,600.00	$12,725.00	$9,050.00	$28,375.00	100%
Gran Total a pagar: (Agua + Aire- 50%)	$3,300.00	$6,362.50	$4,525.00	$14,187.50	50%

CONFIDENCIAL

Privilegio Abogado - Cliente

Appendix B:

Teledyne Monitor Labs Report on

Palo Seco Server

TELEDYNE
MONITOR LABS
A Teledyne Technologies Company

September 30, 2020

Mr. Eloy Acosta
Accounts Manager
M.R. Francescini, Inc.
San Juan, PR

Eloy,

When the C: and D: mirrored hard drives on the RegPerfect server died at Palo Seco, you sent them to me to try and recover any database backups. There were no current backups on the external hard drive; backups were from 2014. I dropped the four drives off at our local recovery outlet, Micro Center, on July 15, 2020.

Unfortunately, only C: drive data was recoverable. Since the database backups reside on the D: drive, I informed Micro Center that I did not want the recoverable data on the C: drive

Please contact me if you have questions.

Regards,

Lisa A. Ware
Software Supervisor
Teledyne Monitor Labs
Englewood, CO

Appendix C:

May 2020 Report on Aguirre Unit 2 Limitations

GOBIERNO DE PUERTO RICO
Autoridad de Energía Eléctrica de Puerto Rico

17 de mayo de 2020

Daniel Hernández Morales, Director
Directorado Generación

Alexis Cruz Figueroa, Jefe
Complejo Generatriz Aguirre

IINFORME DE LIMITACIONES, FALLAS Y ROTURAS UNIDAD 2 CENTRAL AGUIRRE

A continuación, se detallan las limitaciones, fallas y roturas ocurridas en la unidad no. 2 de la central Aguirre desde proceso inicial de arranque.

1. **Avería debido a altas vibraciones en la bomba de agua de alimentación de caldera impulsada por motor eléctrico (MDBFP)**

   El 10 de febrero la bomba de agua de alimentación de caldera impulsada por motor eléctrico sufrió una avería en sus partes internas debido a un alto nivel de vibración. Se reemplazó los componentes y piezas internas de la bomba de agua de alimentación de caldera impulsada por motor eléctrico pertenecientes a la unidad no. 6 de la central Costa Sur. La bomba quedó disponible nuevamente el 19 de febrero de 2020.

2. **Bajos valores de integridad aislamiento a tierra generador**.

   El 8 de enero de 2020 personal de Conservación Eléctrica de Centrales Generatrices alertó sobre los bajos valores obtenidos en la prueba de integridad aislamiento a tierra del generador. Con miras de retornar la condición de aislamiento a tierra del generador a niveles operacionalmente aceptables, se realizaron varias actividades que incluyeron cambios de resina catiónica, utilización de contenedores con mayor capacidad de flujo, modificación en la proporción química de la resina. Estos esfuerzos dirigidos a mejorar la condición de integridad aislamiento a tierra continuaron hasta el 18 de abril de 2020.

3. **Activación bandera 50/27 (Inadvertent Energizing) relé de protección del generador Beckwith 3425.**
   El 21 de febrero se llevó la unidad a velocidad de sincronismo y se intentó excitar el generador en dos ocasiones. En ambos intentos, se activó la bandera 50/27 (Inadvertent Energizing) del relé de protección del generador Beckwith 3425. Los datos oscilógrafos inicialmente sugirieron que la falla estaba localizada fuera de la zona de protección cubierta por el relé, por lo que se realizó una operación de *back fed* desde los interruptores de salida de la unidad con cobertura del transformador de salida hasta los interruptores en las barras normales de 4.16 Kv el 24 febrero de 2020. No se registró ninguna avería, ni se observó condiciones anómalas durante.

   Entre el 2 y el 8 de abril de los corrientes un sinnúmero de pruebas fue realizadas al sistema de excitación del generador bajo la dirección del consultor técnico de General Electric, Erich Brun. Las pruebas arrojaron resultados satisfactorios. El generador fue excitado exitosamente el 14 de febrero de 2020, luego la unidad fue sincronizada al sistema con 25 MW.

4. **Alto nivel de vibraciones cojinete número 4 turbogenerador**.
   Durante las pruebas arranque de unidad efectuadas el 14 de abril de los corrientes se observó un alto nivel de vibración en la magnitud el componente sísmico X instalado en el cojinete número 4 del turbogenerador después de superar el 3,450 rpm. Esfuerzos dirigidos a erradicar o a disminuir la vibración excesiva en el cojinete fueron conducidos por el personal de conservación de la central.

Este fue inspeccionado y se ajustó internamente las claridades del cojinete; lo cual no produjo los resultados esperados. Los datos obtenidos fueron sugerentes al indicar un problema de balance, por lo que se tomó la decisión de contratar los servicios de un especialista técnico a través de HTS.

En las fechas que comprenden desde el 24 de abril hasta el 5 de mayo de 2020 fueron realizados 3 intentos de balance en el área del cojinete. Es importante hacer mención que entre cada intento se detuvo el proceso de arranque de la unidad debido a que el acceso a colocar las pesas indicadas en las recomendaciones; requirieron el debido proceso de enfriamiento del área afectada. Unidad fue sincronizada al sistema el miércoles 6 de mayo de 2020 con niveles de vibración aceptables.

5. **Disparo generador por falla cableado área de los current Transformers (CT's)**
   El relé de protección del generador Beckwith 3425 activó la protección del 87 (Phase Differential Current). Personal relés Ponce inspeccionó el cableado perteneciente a los Current Transformers (CT's). Se encontró avería en los cables que pertenecen a uno de los CT's de protección de la unidad. El cableado fue reparado y la unidad fue retornada a servicio el viernes 8 de mayo de 2020.

6. **Rotura caldera área sobre calentador, esquina A, piso número 8**.
   En la madrugada del domingo 10 de mayo de 2020, la caldera sufrió una rotura en el área del sobre calentador ubicada en la esquina A, piso número 8. Personal de conservación sección calderas encontró cuatro (4) rotura de gran magnitud en el área circundante. Los trabajos de reparación se extendieron hasta el lunes 11 de mayo de 2020 a las 7:00 pm. Unidad fue retornada a servicio el martes 12 de mayo de 2020.

7. **Limitación en carga unidad por fallo en el mecanismo giratorio perteneciente al pre calentador de aire ducto de caldera 2-1.**
   En la noche del jueves 14 de mayo y la madrugada del viernes 15 de mayo de 2020, la unidad sufrió dos limitaciones en carga debido a fallos en el mecanismo giratorio del pre calentador de aire ducto 2-1 de la caldera. Personal conservación calderas-eléctrica reemplazó motor. Condición fue normalizada en la noche del viernes 15 de mayo de 2020.

8. **Limitación en carga unidad por escape de vapor-agua en la válvula de cheque descarga bomba de alimentación agua caldera impulsada por vapor**.
   En la noche del viernes 15 de mayo de 2020 mientras se concluía el cambio de bomba de agua de alimentación de impulsada por motor eléctrico a impulsada por vapor; se observó gran escape de vapor y agua por la válvula de cheque asociada a la descarga de la bomba impulsada por vapor. Hallazgos posteriores indicaron una ruptura en el sello interno de la válvula. Se prevé reemplazo para este próximo miércoles 20 de mayo de 2020.

Appendix D:

Schedule for Installation of SCR/OxCat provided by New Fortress Energy on Sept. 24, 2020

Schedule

Puerto Rico San Juan 5&6

SCR Project

9/24/2020

Task	Start Date	End Date	Duration	Remarks	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
						May				June					July				August					September				October				November					December				January				February				March					April			
					27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	1	8	15	22	1	8	15	22	29	5	12	19	26
Engineering					###	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####
B&V - Release	5/15/2020	5/15/2020					X																																																		
B&V - Pre-planning	5/15/2020	7/17/2020	9				X	X	X	X	X	X	X	X	X	X																																									
B&V - Site Visit	6/15/2020	6/20/2020	0.7									X																																													
B&V - Foundation Design	8/16/2020	11/8/2020	12																		X	X	X	X	X	X	X	X	X	X	X	X																									
B&V - Mechanical Design	8/16/2020	11/8/2020	12																		X	X	X	X	X	X	X	X	X	X	X	X																									
B&V - Electrical Design	8/16/2020	12/6/2020	16																		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																					
B&V - I&C Design	10/15/2020	12/3/2020	7																										X	X	X	X	X	X	X	X																					
B&V - Design Complete (Construction Package)	12/6/2020	12/6/2020																																																							
B&V - Attend HW/SW FAT	2/8/2021	2/15/2021	1																																											X	X										
B&V - Construction Support	12/11/2020	4/30/2021	20																																		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Procurement																																																									
Fabrication - VPI SCR/CO, AMMONIA EQUIPMENT																																																									
VPI - Release	5/15/2020	5/15/2020					X																																																		
VPI - SCR/CO Equipment to POI	5/15/2020	2/12/2021	39				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X											
VPI - Ammonia Tank, unloading skid and AFCU	5/15/2020	2/12/2021	39				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X											
VPI - Casing Reinforcement Steel for Spool duct to the Port of Sar	5/15/2020	1/15/2021	35				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															
VPI - P&IDs	5/15/2020	8/16/2020	13.3				X	X	X	X	X	X	X	X	X	X	X	X	X	X																																					
VPI - Pipeline List, Valve List, TP List	5/15/2020	10/15/2020	21.9				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																												
VPI - Erection drawings including piping Iso's	5/15/2020	9/30/2020	19.8				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																														
VPI - NTE Utility Requirements	5/15/2020	8/16/2020	13.3				X	X	X	X	X	X	X	X	X	X	X	X	X	X																																					
VPI - NTE Foundation design data	5/15/2020	8/16/2020	13.3				X	X	X	X	X	X	X	X	X	X	X	X	X	X																																					
VPI - Certified Loads	5/15/2020	10/15/2020	21.9				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																												
VPI - Dimension drawings, anchor bolts	5/15/2020	10/15/2020	21.9				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																												
VPI - Control System Philosophy	5/15/2020	10/15/2020	21.9				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																												
VPI - wiring diagrams, instrument DS, Instrument connection dia	5/15/2020	10/15/2020	21.9				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																												
VPI - Control System I/O List (Prelim)	5/15/2020	9/15/2020	17.6				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																																
VPI - Control System I/O List (Final)	5/15/2020	10/15/2020	21.9	**1 week early**			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																												
VPI - Graphic Displays	5/15/2020	11/14/2020	26.2	**2 weeks early**			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																								
VPI - Control system functional loop and logic diagrams	5/15/2020	9/15/2020	17.6				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																																
VPI - Pipe isometrics	5/15/2020	10/15/2020	21.9				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																												
VPI - Ammonia Tank Foundation design data and tank dimension	5/15/2020	9/15/2020	17.6				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																																
VPI - Final Load List	5/15/2020	11/14/2020	26.2				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																								
DCS Equipment - Emerson																																																									
Emerson - Preliminary Input from VPI	9/15/2020	9/15/2020	0.0																						X																																
Emerson - Specify	9/21/2020	**10/12/2020**	3.0																							X	X	X	X																												
Emerson - Bid/Proposal	10/12/2020	11/2/2020	3.0																										X	X	X	X																									
Emerson - Neg/Award PO	11/2/2020	11/16/2020	2.0																													X	X	X																							
Emerson - Final Design Input from VPI for Hardware	10/15/2020	10/15/2020	0.0	**1 week early**																									X																												
Emerson - Final Design Input from VPI for Software	11/14/2020	11/14/2020	0.0	**2 weeks early**																													X																								
Emerson - Fabrication (Hardware)	11/16/2020	2/8/2021	12.0																															X	X	X	X	X	X	X	X	X	X	X	X	X											
Emerson - Software Programing	11/16/2020	2/8/2021	12.0																															X	X	X	X	X	X	X	X	X	X	X	X	X											
Emerson - HW/SW FAT	2/8/2021	2/15/2021	1.0																																											X	X										
Emerson - HW/SW Delivery	2/15/2021	3/15/2021	4.0																																												X	X	X	X	X						
Construction																																																									
B&V - Develop Construction Specification	10/2/2020	10/30/2020	4																								X	X	X	X	X																										
Bid Construction Contract	10/30/2020	11/20/2020	3																												X	X	X	X																							
Neg/Award Construction Contract	11/20/2020	12/11/2020	3																															X	X	X	X																			
Construction Mobilization	12/11/2020	12/18/2020	1																																		X	X																			
Equipment Foundation Installation	12/18/2020	**1/29/2021**	6																																			X	X	X	X	X	X	X													
Mechanical/Electrical/Controls Installation	12/18/2020	4/2/2021	**15**																																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
Unit 5 Outage	**2/1/2021**	**4/12/2021**	**10**																																										X	X	X	X	X	X	X	X	X	X	X		
Install HRSG Internals	2/1/2021	4/12/2021	10																																										X	X	X	X	X	X	X	X	X	X	X		
SU & Commissioning	4/12/2021	4/23/2021	1																																																			X	X	
Performance Testing and Substantial Completion	4/23/2021	4/30/2021	1																																																				X	X
Commercial Operation	4/30/2021	4/30/2021																																																						X

Appendix E:

Historical and Projected Operating Hours

for San Juan Units 5-6

Outage Dates	Start	End	Comments
Unit 5 Conversion	10/10/2019	4/15/2020	
Unit 5 Catalyst	1/23/2021	5/8/2021	
Unit 6 Conversion	3/1/2020	4/25/2020	
Unit 6 Maintenanc	11/7/2020	12/5/2020	

Actual=	
Forecast=	

Count	Date	Unit 5 Hrs	Unit 6 Hrs	Rolling 365 Total Hrs
1	1/1/2018	0	24	
2	1/2/2018	2	24	
3	1/3/2018	0	24	
4	1/4/2018	0	24	
5	1/5/2018	0	24	
6	1/6/2018	0	24	
7	1/7/2018	0	24	
8	1/8/2018	0	24	
9	1/9/2018	8	9	
10	1/10/2018	0	24	
11	1/11/2018	0	24	
12	1/12/2018	0	24	
13	1/13/2018	0	24	
14	1/14/2018	0	1	
15	1/15/2018	0	0	
16	1/16/2018	0	6	
17	1/17/2018	0	24	
18	1/18/2018	0	24	
19	1/19/2018	0	24	
20	1/20/2018	15	24	
21	1/21/2018	24	24	
22	1/22/2018	24	24	
23	1/23/2018	24	24	
24	1/24/2018	24	19	
25	1/25/2018	24	10	
26	1/26/2018	24	24	
27	1/27/2018	24	24	
28	1/28/2018	24	24	
29	1/29/2018	24	24	
30	1/30/2018	24	24	
31	1/31/2018	24	24	
32	2/1/2018	24	24	
33	2/2/2018	10	24	
34	2/3/2018	24	24	
35	2/4/2018	24	1	
36	2/5/2018	24	0	
37	2/6/2018	24	0	
38	2/7/2018	24	0	
39	2/8/2018	24	0	

40	2/9/2018	24	0	
41	2/10/2018	24	0	
42	2/11/2018	23	0	
43	2/12/2018	24	0	
44	2/13/2018	24	0	
45	2/14/2018	24	0	
46	2/15/2018	24	0	
47	2/16/2018	24	0	
48	2/17/2018	24	0	
49	2/18/2018	24	0	
50	2/19/2018	24	0	
51	2/20/2018	24	0	
52	2/21/2018	24	0	
53	2/22/2018	24	0	
54	2/23/2018	24	0	
55	2/24/2018	24	0	
56	2/25/2018	24	0	
57	2/26/2018	24	0	
58	2/27/2018	24	0	
59	2/28/2018	24	0	
60	3/1/2018	21	0	
61	3/2/2018	24	0	
62	3/3/2018	24	0	
63	3/4/2018	24	0	
64	3/5/2018	24	0	
65	3/6/2018	24	0	
66	3/7/2018	24	0	
67	3/8/2018	24	0	
68	3/9/2018	24	0	
69	3/10/2018	24	0	
70	3/11/2018	24	0	
71	3/12/2018	24	0	
72	3/13/2018	24	0	
73	3/14/2018	24	0	
74	3/15/2018	24	0	
75	3/16/2018	24	0	
76	3/17/2018	24	0	
77	3/18/2018	24	0	
78	3/19/2018	24	2	
79	3/20/2018	24	8	
80	3/21/2018	24	24	
81	3/22/2018	1	24	
82	3/23/2018	0	24	
83	3/24/2018	4	24	
84	3/25/2018	24	24	
85	3/26/2018	24	24	
86	3/27/2018	24	24	
87	3/28/2018	24	24	
88	3/29/2018	24	24	

89	3/30/2018	24	24	
90	3/31/2018	24	24	
91	4/1/2018	11	24	
92	4/2/2018	4	24	
93	4/3/2018	5	24	
94	4/4/2018	24	24	
95	4/5/2018	24	24	
96	4/6/2018	24	24	
97	4/7/2018	21	24	
98	4/8/2018	24	24	
99	4/9/2018	24	24	
100	4/10/2018	24	24	
101	4/11/2018	24	24	
102	4/12/2018	21	13	
103	4/13/2018	24	24	
104	4/14/2018	24	24	
105	4/15/2018	24	24	
106	4/16/2018	24	24	
107	4/17/2018	24	24	
108	4/18/2018	19	16	
109	4/19/2018	24	24	
110	4/20/2018	24	24	
111	4/21/2018	24	24	
112	4/22/2018	24	24	
113	4/23/2018	24	24	
114	4/24/2018	24	24	
115	4/25/2018	24	24	
116	4/26/2018	24	24	
117	4/27/2018	24	24	
118	4/28/2018	24	24	
119	4/29/2018	24	24	
120	4/30/2018	24	24	
121	5/1/2018	24	24	
122	5/2/2018	24	24	
123	5/3/2018	24	24	
124	5/4/2018	24	24	
125	5/5/2018	24	24	
126	5/6/2018	24	24	
127	5/7/2018	24	24	
128	5/8/2018	24	24	
129	5/9/2018	24	24	
130	5/10/2018	24	24	
131	5/11/2018	24	24	
132	5/12/2018	18	24	
133	5/13/2018	24	24	
134	5/14/2018	24	24	
135	5/15/2018	24	24	
136	5/16/2018	24	24	
137	5/17/2018	24	24	

138	5/18/2018	24	24	
139	5/19/2018	24	24	
140	5/20/2018	24	24	
141	5/21/2018	24	24	
142	5/22/2018	24	24	
143	5/23/2018	24	24	
144	5/24/2018	24	24	
145	5/25/2018	24	24	
146	5/26/2018	24	24	
147	5/27/2018	24	24	
148	5/28/2018	24	24	
149	5/29/2018	24	22	
150	5/30/2018	24	24	
151	5/31/2018	24	24	
152	6/1/2018	24	24	
153	6/2/2018	24	24	
154	6/3/2018	24	24	
155	6/4/2018	24	24	
156	6/5/2018	24	24	
157	6/6/2018	24	24	
158	6/7/2018	24	24	
159	6/8/2018	24	24	
160	6/9/2018	1	24	
161	6/10/2018	0	24	
162	6/11/2018	0	24	
163	6/12/2018	0	24	
164	6/13/2018	1	24	
165	6/14/2018	4	24	
166	6/15/2018	17	24	
167	6/16/2018	24	24	
168	6/17/2018	24	24	
169	6/18/2018	24	24	
170	6/19/2018	24	24	
171	6/20/2018	24	24	
172	6/21/2018	24	24	
173	6/22/2018	24	24	
174	6/23/2018	24	24	
175	6/24/2018	24	24	
176	6/25/2018	24	24	
177	6/26/2018	24	24	
178	6/27/2018	24	24	
179	6/28/2018	24	24	
180	6/29/2018	24	24	
181	6/30/2018	24	2	
182	7/1/2018	7	1	
183	7/2/2018	24	24	
184	7/3/2018	24	24	
185	7/4/2018	24	24	
186	7/5/2018	24	24	

187	7/6/2018	24	24	
188	7/7/2018	24	24	
189	7/8/2018	24	24	
190	7/9/2018	24	24	
191	7/10/2018	24	24	
192	7/11/2018	24	24	
193	7/12/2018	24	24	
194	7/13/2018	24	24	
195	7/14/2018	24	24	
196	7/15/2018	24	24	
197	7/16/2018	24	2	
198	7/17/2018	24	5	
199	7/18/2018	24	24	
200	7/19/2018	24	24	
201	7/20/2018	24	24	
202	7/21/2018	24	24	
203	7/22/2018	24	24	
204	7/23/2018	24	24	
205	7/24/2018	24	24	
206	7/25/2018	24	24	
207	7/26/2018	24	24	
208	7/27/2018	24	24	
209	7/28/2018	24	24	
210	7/29/2018	24	24	
211	7/30/2018	24	24	
212	7/31/2018	24	24	
213	8/1/2018	24	24	
214	8/2/2018	24	24	
215	8/3/2018	24	24	
216	8/4/2018	24	24	
217	8/5/2018	24	24	
218	8/6/2018	24	24	
219	8/7/2018	24	24	
220	8/8/2018	24	24	
221	8/9/2018	24	24	
222	8/10/2018	24	24	
223	8/11/2018	24	24	
224	8/12/2018	24	24	
225	8/13/2018	24	24	
226	8/14/2018	24	24	
227	8/15/2018	24	24	
228	8/16/2018	24	24	
229	8/17/2018	24	24	
230	8/18/2018	0	24	
231	8/19/2018	16	24	
232	8/20/2018	24	24	
233	8/21/2018	24	24	
234	8/22/2018	24	24	
235	8/23/2018	24	24	

236	8/24/2018	24	24	
237	8/25/2018	24	24	
238	8/26/2018	24	24	
239	8/27/2018	24	24	
240	8/28/2018	24	24	
241	8/29/2018	24	24	
242	8/30/2018	24	24	
243	8/31/2018	24	24	
244	9/1/2018	24	24	
245	9/2/2018	24	24	
246	9/3/2018	24	24	
247	9/4/2018	24	24	
248	9/5/2018	24	24	
249	9/6/2018	24	24	
250	9/7/2018	24	24	
251	9/8/2018	24	24	
252	9/9/2018	24	24	
253	9/10/2018	24	24	
254	9/11/2018	24	24	
255	9/12/2018	24	24	
256	9/13/2018	24	24	
257	9/14/2018	24	24	
258	9/15/2018	24	24	
259	9/16/2018	24	24	
260	9/17/2018	24	24	
261	9/18/2018	24	24	
262	9/19/2018	24	24	
263	9/20/2018	24	24	
264	9/21/2018	24	24	
265	9/22/2018	24	24	
266	9/23/2018	24	24	
267	9/24/2018	24	24	
268	9/25/2018	24	24	
269	9/26/2018	24	24	
270	9/27/2018	24	24	
271	9/28/2018	24	1	
272	9/29/2018	24	2	
273	9/30/2018	24	14	
274	10/1/2018	24	24	
275	10/2/2018	24	24	
276	10/3/2018	24	24	
277	10/4/2018	24	24	
278	10/5/2018	24	24	
279	10/6/2018	24	24	
280	10/7/2018	0	24	
281	10/8/2018	0	24	
282	10/9/2018	11	24	
283	10/10/2018	24	24	
284	10/11/2018	24	24	

285	10/12/2018	24	24	
286	10/13/2018	24	24	
287	10/14/2018	24	24	
288	10/15/2018	24	24	
289	10/16/2018	24	24	
290	10/17/2018	24	24	
291	10/18/2018	0	21	
292	10/19/2018	0	24	
293	10/20/2018	0	24	
294	10/21/2018	0	24	
295	10/22/2018	0	24	
296	10/23/2018	0	24	
297	10/24/2018	0	24	
298	10/25/2018	0	24	
299	10/26/2018	0	24	
300	10/27/2018	0	24	
301	10/28/2018	0	24	
302	10/29/2018	0	24	
303	10/30/2018	0	24	
304	10/31/2018	0	24	
305	11/1/2018	0	24	
306	11/2/2018	0	24	
307	11/3/2018	0	24	
308	11/4/2018	0	24	
309	11/5/2018	0	24	
310	11/6/2018	0	24	
311	11/7/2018	0	24	
312	11/8/2018	0	24	
313	11/9/2018	0	24	
314	11/10/2018	0	24	
315	11/11/2018	0	24	
316	11/12/2018	0	24	
317	11/13/2018	0	24	
318	11/14/2018	0	24	
319	11/15/2018	1	24	
320	11/16/2018	0	24	
321	11/17/2018	0	24	
322	11/18/2018	0	24	
323	11/19/2018	9	24	
324	11/20/2018	8	24	
325	11/21/2018	17	24	
326	11/22/2018	0	24	
327	11/23/2018	12	23	
328	11/24/2018	24	0	
329	11/25/2018	24	0	
330	11/26/2018	14	6	
331	11/27/2018	0	24	
332	11/28/2018	0	24	
333	11/29/2018	13	24	

334	11/30/2018	24	24	
335	12/1/2018	17	24	
336	12/2/2018	0	24	
337	12/3/2018	10	24	
338	12/4/2018	24	24	
339	12/5/2018	24	24	
340	12/6/2018	24	24	
341	12/7/2018	24	24	
342	12/8/2018	24	24	
343	12/9/2018	24	24	
344	12/10/2018	24	24	
345	12/11/2018	24	24	
346	12/12/2018	24	24	
347	12/13/2018	24	24	
348	12/14/2018	24	24	
349	12/15/2018	24	24	
350	12/16/2018	24	24	
351	12/17/2018	24	24	
352	12/18/2018	24	1	
353	12/19/2018	24	0	
354	12/20/2018	24	0	
355	12/21/2018	24	0	
356	12/22/2018	24	0	
357	12/23/2018	24	0	
358	12/24/2018	24	0	
359	12/25/2018	24	0	
360	12/26/2018	24	0	
361	12/27/2018	24	0	
362	12/28/2018	24	0	
363	12/29/2018	24	0	
364	12/30/2018	24	0	
365	12/31/2018	24	0	
366	1/1/2019	24	0	13,966.00
367	1/2/2019	24	0	13,966.00
368	1/3/2019	24	0	13,964.00
369	1/4/2019	24	0	13,964.00
370	1/5/2019	24	0	13,964.00
371	1/6/2019	24	0	13,964.00
372	1/7/2019	24	0	13,964.00
373	1/8/2019	24	0	13,964.00
374	1/9/2019	24	0	13,964.00
375	1/10/2019	24	0	13,971.00
376	1/11/2019	24	9	13,971.00
377	1/12/2019	24	0	13,980.00
378	1/13/2019	24	0	13,980.00
379	1/14/2019	24	9	13,980.00
380	1/15/2019	16	24	14,012.00
381	1/16/2019	0	24	14,052.00
382	1/17/2019	0	24	14,070.00

383	1/18/2019	0	24	14,070.00
384	1/19/2019	0	24	14,070.00
385	1/20/2019	0	24	14,070.00
386	1/21/2019	0	24	14,055.00
387	1/22/2019	0	24	14,031.00
388	1/23/2019	0	24	14,007.00
389	1/24/2019	0	24	13,983.00
390	1/25/2019	11	24	13,964.00
391	1/26/2019	24	24	13,965.00
392	1/27/2019	24	24	13,965.00
393	1/28/2019	24	24	13,965.00
394	1/29/2019	24	24	13,965.00
395	1/30/2019	24	1	13,965.00
396	1/31/2019	24	0	13,942.00
397	2/1/2019	24	0	13,918.00
398	2/2/2019	24	0	13,894.00
399	2/3/2019	24	0	13,884.00
400	2/4/2019	24	0	13,860.00
401	2/5/2019	24	0	13,859.00
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403	2/7/2019	24	0	13,859.00
404	2/8/2019	24	0	13,859.00
405	2/9/2019	24	0	13,859.00
406	2/10/2019	24	0	13,859.00
407	2/11/2019	24	0	13,859.00
408	2/12/2019	24	0	13,860.00
409	2/13/2019	24	0	13,860.00
410	2/14/2019	24	0	13,860.00
411	2/15/2019	24	14	13,860.00
412	2/16/2019	24	24	13,874.00
413	2/17/2019	23	24	13,898.00
414	2/18/2019	0	24	13,921.00
415	2/19/2019	0	24	13,921.00
416	2/20/2019	0	24	13,921.00
417	2/21/2019	0	24	13,921.00
418	2/22/2019	0	24	13,921.00
419	2/23/2019	0	24	13,921.00
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421	2/25/2019	0	24	13,921.00
422	2/26/2019	0	24	13,921.00
423	2/27/2019	0	24	13,921.00
424	2/28/2019	0	24	13,921.00
425	3/1/2019	0	24	13,921.00
426	3/2/2019	0	24	13,924.00
427	3/3/2019	0	24	13,924.00
428	3/4/2019	0	24	13,924.00
429	3/5/2019	0	24	13,924.00
430	3/6/2019	0	24	13,924.00
431	3/7/2019	0	24	13,924.00

432	3/8/2019	0	24	13,924.00
433	3/9/2019	0	24	13,924.00
434	3/10/2019	0	24	13,924.00
435	3/11/2019	0	24	13,924.00
436	3/12/2019	0	24	13,924.00
437	3/13/2019	0	24	13,924.00
438	3/14/2019	0	24	13,924.00
439	3/15/2019	0	24	13,924.00
440	3/16/2019	0	24	13,924.00
441	3/17/2019	0	24	13,924.00
442	3/18/2019	5	24	13,924.00
443	3/19/2019	3	24	13,929.00
444	3/20/2019	6	24	13,930.00
445	3/21/2019	24	24	13,928.00
446	3/22/2019	24	24	13,928.00
447	3/23/2019	24	24	13,951.00
448	3/24/2019	24	24	13,975.00
449	3/25/2019	24	24	13,995.00
450	3/26/2019	24	24	13,995.00
451	3/27/2019	24	24	13,995.00
452	3/28/2019	24	24	13,995.00
453	3/29/2019	1	24	13,995.00
454	3/30/2019	0	24	13,972.00
455	3/31/2019	0	24	13,948.00
456	4/1/2019	10	24	13,924.00
457	4/2/2019	24	24	13,923.00
458	4/3/2019	0	24	13,943.00
459	4/4/2019	0	24	13,938.00
460	4/5/2019	0	24	13,914.00
461	4/6/2019	0	24	13,890.00
462	4/7/2019	0	24	13,866.00
463	4/8/2019	0	24	13,845.00
464	4/9/2019	10	24	13,821.00
465	4/10/2019	5	24	13,807.00
466	4/11/2019	12	24	13,788.00
467	4/12/2019	24	24	13,776.00
468	4/13/2019	24	23	13,790.00
469	4/14/2019	24	14	13,789.00
470	4/15/2019	24	24	13,779.00
471	4/16/2019	24	24	13,779.00
472	4/17/2019	24	24	13,779.00
473	4/18/2019	19	24	13,779.00
474	4/19/2019	11	24	13,787.00
475	4/20/2019	24	24	13,774.00
476	4/21/2019	24	24	13,774.00
477	4/22/2019	24	24	13,774.00
478	4/23/2019	24	24	13,774.00
479	4/24/2019	24	24	13,774.00
480	4/25/2019	24	24	13,774.00

481	4/26/2019	24	24	13,774.00
482	4/27/2019	24	24	13,774.00
483	4/28/2019	24	12	13,774.00
484	4/29/2019	24	0	13,762.00
485	4/30/2019	24	0	13,738.00
486	5/1/2019	24	0	13,714.00
487	5/2/2019	24	0	13,690.00
488	5/3/2019	24	0	13,666.00
489	5/4/2019	24	0	13,642.00
490	5/5/2019	24	0	13,618.00
491	5/6/2019	24	0	13,594.00
492	5/7/2019	24	0	13,570.00
493	5/8/2019	24	0	13,546.00
494	5/9/2019	24	0	13,522.00
495	5/10/2019	24	0	13,498.00
496	5/11/2019	24	0	13,474.00
497	5/12/2019	24	0	13,450.00
498	5/13/2019	24	0	13,432.00
499	5/14/2019	24	0	13,408.00
500	5/15/2019	24	0	13,384.00
501	5/16/2019	24	0	13,360.00
502	5/17/2019	24	0	13,336.00
503	5/18/2019	24	0	13,312.00
504	5/19/2019	24	0	13,288.00
505	5/20/2019	24	0	13,264.00
506	5/21/2019	24	0	13,240.00
507	5/22/2019	24	0	13,216.00
508	5/23/2019	24	0	13,192.00
509	5/24/2019	24	0	13,168.00
510	5/25/2019	24	0	13,144.00
511	5/26/2019	24	0	13,120.00
512	5/27/2019	24	6	13,096.00
513	5/28/2019	24	5	13,078.00
514	5/29/2019	24	16	13,059.00
515	5/30/2019	24	24	13,053.00
516	5/31/2019	5	24	13,053.00
517	6/1/2019	0	24	13,034.00
518	6/2/2019	2	13	13,010.00
519	6/3/2019	0	11	12,977.00
520	6/4/2019	2	24	12,940.00
521	6/5/2019	13	24	12,918.00
522	6/6/2019	24	24	12,907.00
523	6/7/2019	24	24	12,907.00
524	6/8/2019	24	24	12,907.00
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526	6/10/2019	24	13	12,930.00
527	6/11/2019	24	0	12,943.00
528	6/12/2019	24	12	12,943.00
529	6/13/2019	24	24	12,955.00

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531	6/15/2019	24	0	12,981.00
532	6/16/2019	24	0	12,964.00
533	6/17/2019	24	14	12,940.00
534	6/18/2019	2	24	12,930.00
535	6/19/2019	0	24	12,908.00
536	6/20/2019	0	24	12,884.00
537	6/21/2019	7	24	12,860.00
538	6/22/2019	24	24	12,843.00
539	6/23/2019	24	24	12,843.00
540	6/24/2019	24	24	12,843.00
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542	6/26/2019	24	24	12,843.00
543	6/27/2019	24	24	12,843.00
544	6/28/2019	24	24	12,843.00
545	6/29/2019	24	24	12,843.00
546	6/30/2019	24	24	12,843.00
547	7/1/2019	24	24	12,865.00
548	7/2/2019	24	24	12,905.00
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551	7/5/2019	24	24	12,905.00
552	7/6/2019	24	24	12,905.00
553	7/7/2019	24	24	12,905.00
554	7/8/2019	24	24	12,905.00
555	7/9/2019	24	24	12,905.00
556	7/10/2019	24	24	12,905.00
557	7/11/2019	24	24	12,905.00
558	7/12/2019	24	24	12,905.00
559	7/13/2019	24	24	12,905.00
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562	7/16/2019	24	24	12,905.00
563	7/17/2019	24	24	12,927.00
564	7/18/2019	24	24	12,946.00
565	7/19/2019	24	24	12,946.00
566	7/20/2019	24	17	12,946.00
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573	7/27/2019	24	24	12,939.00
574	7/28/2019	24	24	12,939.00
575	7/29/2019	24	24	12,939.00
576	7/30/2019	24	24	12,939.00
577	7/31/2019	24	24	12,939.00
578	8/1/2019	24	24	12,939.00

579	8/2/2019	24	24	12,939.00
580	8/3/2019	24	24	12,939.00
581	8/4/2019	24	24	12,939.00
582	8/5/2019	24	24	12,939.00
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584	8/7/2019	24	24	12,939.00
585	8/8/2019	24	24	12,939.00
586	8/9/2019	24	24	12,939.00
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588	8/11/2019	24	24	12,939.00
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591	8/14/2019	24	24	12,939.00
592	8/15/2019	24	24	12,939.00
593	8/16/2019	24	24	12,939.00
594	8/17/2019	24	24	12,939.00
595	8/18/2019	24	24	12,939.00
596	8/19/2019	24	24	12,963.00
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611	9/3/2019	24	24	12,971.00
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615	9/7/2019	24	24	12,971.00
616	9/8/2019	24	24	12,971.00
617	9/9/2019	24	24	12,971.00
618	9/10/2019	24	24	12,971.00
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622	9/14/2019	14	24	12,971.00
623	9/15/2019	0	24	12,961.00
624	9/16/2019	0	24	12,937.00
625	9/17/2019	0	24	12,913.00
626	9/18/2019	0	24	12,889.00
627	9/19/2019	0	24	12,865.00

628	9/20/2019	0	24	12,841.00
629	9/21/2019	0	24	12,817.00
630	9/22/2019	0	24	12,793.00
631	9/23/2019	0	24	12,769.00
632	9/24/2019	0	24	12,745.00
633	9/25/2019	0	24	12,721.00
634	9/26/2019	9	24	12,697.00
635	9/27/2019	22	24	12,682.00
636	9/28/2019	24	24	12,680.00
637	9/29/2019	24	24	12,703.00
638	9/30/2019	24	24	12,725.00
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643	10/5/2019	24	24	12,728.00
644	10/6/2019	24	24	12,728.00
645	10/7/2019	24	24	12,728.00
646	10/8/2019	24	24	12,752.00
647	10/9/2019	18	24	12,776.00
648	10/10/2019	0	24	12,783.00
649	10/11/2019	0	24	12,759.00
650	10/12/2019	0	2	12,735.00
651	10/13/2019	0	0	12,689.00
652	10/14/2019	0	0	12,641.00
653	10/15/2019	0	9	12,593.00
654	10/16/2019	0	24	12,554.00
655	10/17/2019	0	24	12,530.00
656	10/18/2019	0	24	12,506.00
657	10/19/2019	0	24	12,509.00
658	10/20/2019	0	24	12,509.00
659	10/21/2019	0	24	12,509.00
660	10/22/2019	0	24	12,509.00
661	10/23/2019	0	24	12,509.00
662	10/24/2019	0	24	12,509.00
663	10/25/2019	0	24	12,509.00
664	10/26/2019	0	24	12,509.00
665	10/27/2019	0	24	12,509.00
666	10/28/2019	0	23	12,509.00
667	10/29/2019	0	24	12,508.00
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675	11/6/2019	0	24	12,508.00
676	11/7/2019	0	24	12,508.00

677	11/8/2019	0	24	12,508.00
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679	11/10/2019	0	24	12,508.00
680	11/11/2019	0	24	12,508.00
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696	11/27/2019	0	24	12,466.00
697	11/28/2019	0	24	12,466.00
698	11/29/2019	0	24	12,466.00
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704	12/5/2019	0	24	12,378.00
705	12/6/2019	0	24	12,354.00
706	12/7/2019	0	24	12,330.00
707	12/8/2019	0	24	12,306.00
708	12/9/2019	0	17	12,282.00
709	12/10/2019	0	4	12,251.00
710	12/11/2019	0	24	12,207.00
711	12/12/2019	0	24	12,183.00
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713	12/14/2019	0	24	12,135.00
714	12/15/2019	0	24	12,111.00
715	12/16/2019	0	24	12,087.00
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717	12/18/2019	0	24	12,039.00
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720	12/21/2019	0	24	12,038.00
721	12/22/2019	0	24	12,038.00
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724	12/25/2019	0	24	12,038.00
725	12/26/2019	0	24	12,038.00

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727	12/28/2019	0	24	12,038.00
728	12/29/2019	0	24	12,038.00
729	12/30/2019	0	24	12,038.00
730	12/31/2019	0	24	12,038.00
731	1/1/2020	0	24	12,038.00
732	1/2/2020	0	24	12,038.00
733	1/3/2020	0	24	12,038.00
734	1/4/2020	0	24	12,038.00
735	1/5/2020	0	24	12,038.00
736	1/6/2020	0	24	12,038.00
737	1/7/2020	0	10	12,038.00
738	1/8/2020	0	24	12,024.00
739	1/9/2020	0	24	12,024.00
740	1/10/2020	0	24	12,024.00
741	1/11/2020	0	24	12,024.00
742	1/12/2020	0	24	12,015.00
743	1/13/2020	0	24	12,015.00
744	1/14/2020	0	24	12,015.00
745	1/15/2020	0	24	12,006.00
746	1/16/2020	0	24	11,990.00
747	1/17/2020	0	24	11,990.00
748	1/18/2020	7	24	11,990.00
749	1/19/2020	5	24	11,997.00
750	1/20/2020	0	24	12,002.00
751	1/21/2020	16	24	12,002.00
752	1/22/2020	24	24	12,018.00
753	1/23/2020	24	24	12,042.00
754	1/24/2020	24	24	12,066.00
755	1/25/2020	24	24	12,090.00
756	1/26/2020	24	24	12,103.00
757	1/27/2020	24	24	12,103.00
758	1/28/2020	24	24	12,103.00
759	1/29/2020	24	24	12,103.00
760	1/30/2020	24	24	12,103.00
761	1/31/2020	24	24	12,126.00
762	2/1/2020	24	24	12,150.00
763	2/2/2020	24	24	12,174.00
764	2/3/2020	24	24	12,198.00
765	2/4/2020	24	24	12,222.00
766	2/5/2020	24	24	12,246.00
767	2/6/2020	24	24	12,270.00
768	2/7/2020	24	24	12,294.00
769	2/8/2020	24	24	12,318.00
770	2/9/2020	24	24	12,342.00
771	2/10/2020	24	24	12,366.00
772	2/11/2020	2	24	12,390.00
773	2/12/2020	0	24	12,392.00
774	2/13/2020	14	24	12,392.00

775	2/14/2020	24	24	12,406.00
776	2/15/2020	24	24	12,430.00
777	2/16/2020	24	24	12,440.00
778	2/17/2020	24	24	12,440.00
779	2/18/2020	24	24	12,441.00
780	2/19/2020	24	24	12,465.00
781	2/20/2020	24	24	12,489.00
782	2/21/2020	24	24	12,513.00
783	2/22/2020	24	24	12,537.00
784	2/23/2020	24	24	12,561.00
785	2/24/2020	24	24	12,585.00
786	2/25/2020	24	15	12,609.00
787	2/26/2020	24	0	12,624.00
788	2/27/2020	24	0	12,624.00
789	2/28/2020	16	0	12,624.00
790	2/29/2020	5	0	12,616.00
791	3/1/2020	24	0	12,597.00
792	3/2/2020	24	0	12,597.00
793	3/3/2020	24	0	12,597.00
794	3/4/2020	24	0	12,597.00
795	3/5/2020	24	0	12,597.00
796	3/6/2020	24	0	12,597.00
797	3/7/2020	24	0	12,597.00
798	3/8/2020	16	0	12,597.00
799	3/9/2020	24	0	12,589.00
800	3/10/2020	24	0	12,589.00
801	3/11/2020	24	0	12,589.00
802	3/12/2020	24	0	12,589.00
803	3/13/2020	24	0	12,589.00
804	3/14/2020	24	0	12,589.00
805	3/15/2020	24	0	12,589.00
806	3/16/2020	24	0	12,589.00
807	3/17/2020	24	0	12,589.00
808	3/18/2020	24	0	12,584.00
809	3/19/2020	24	0	12,581.00
810	3/20/2020	24	0	12,575.00
811	3/21/2020	24	0	12,551.00
812	3/22/2020	24	0	12,527.00
813	3/23/2020	1	0	12,503.00
814	3/24/2020	0	0	12,456.00
815	3/25/2020	0	0	12,408.00
816	3/26/2020	0	0	12,360.00
817	3/27/2020	0	0	12,312.00
818	3/28/2020	0	0	12,264.00
819	3/29/2020	0	0	12,239.00
820	3/30/2020	0	0	12,215.00
821	3/31/2020	0	0	12,191.00
822	4/1/2020	0	0	12,157.00
823	4/2/2020	0	0	12,109.00

824	4/3/2020	0	0	12,085.00
825	4/4/2020	0	0	12,061.00
826	4/5/2020	0	0	12,037.00
827	4/6/2020	1	0	12,013.00
828	4/7/2020	0	0	11,990.00
829	4/8/2020	10	0	11,966.00
830	4/9/2020	23	0	11,942.00
831	4/10/2020	10	0	11,936.00
832	4/11/2020	14	0	11,910.00
833	4/12/2020	22	0	11,876.00
834	4/13/2020	24	0	11,851.00
835	4/14/2020	24	3	11,837.00
836	4/15/2020	24	0	11,816.00
837	4/16/2020	24	5	11,792.00
838	4/17/2020	24	4	11,773.00
839	4/18/2020	18	7	11,758.00
840	4/19/2020	24	8	11,748.00
841	4/20/2020	24	9	11,732.00
842	4/21/2020	24	6	11,717.00
843	4/22/2020	24	0	11,699.00
844	4/23/2020	24	4	11,675.00
845	4/24/2020	24	14	11,655.00
846	4/25/2020	24	5	11,645.00
847	4/26/2020	12	13	11,626.00
848	4/27/2020	24	8	11,603.00
849	4/28/2020	24	6	11,599.00
850	4/29/2020	24	24	11,605.00
851	4/30/2020	24	24	11,629.00
852	5/1/2020	24	24	11,653.00
853	5/2/2020	24	24	11,677.00
854	5/3/2020	24	24	11,701.00
855	5/4/2020	24	24	11,725.00
856	5/5/2020	24	24	11,749.00
857	5/6/2020	24	24	11,773.00
858	5/7/2020	24	24	11,797.00
859	5/8/2020	24	24	11,821.00
860	5/9/2020	14	8	11,845.00
861	5/10/2020	24	15	11,843.00
862	5/11/2020	24	24	11,858.00
863	5/12/2020	24	24	11,882.00
864	5/13/2020	24	24	11,906.00
865	5/14/2020	24	24	11,930.00
866	5/15/2020	24	24	11,954.00
867	5/16/2020	24	9	11,978.00
868	5/17/2020	24	24	11,987.00
869	5/18/2020	24	24	12,011.00
870	5/19/2020	24	24	12,035.00
871	5/20/2020	24	24	12,059.00
872	5/21/2020	24	24	12,083.00

873	5/22/2020	24	24	12,107.00
874	5/23/2020	24	24	12,131.00
875	5/24/2020	24	24	12,155.00
876	5/25/2020	24	24	12,179.00
877	5/26/2020	22	24	12,203.00
878	5/27/2020	14	24	12,219.00
879	5/28/2020	24	23	12,228.00
880	5/29/2020	24	24	12,235.00
881	5/30/2020	24	24	12,235.00
882	5/31/2020	22	23	12,254.00
883	6/1/2020	14	14	12,275.00
884	6/2/2020	0	0	12,288.00
885	6/3/2020	0	8	12,277.00
886	6/4/2020	13	24	12,259.00
887	6/5/2020	24	24	12,259.00
888	6/6/2020	24	24	12,259.00
889	6/7/2020	24	24	12,259.00
890	6/8/2020	24	24	12,259.00
891	6/9/2020	24	24	12,259.00
892	6/10/2020	24	24	12,270.00
893	6/11/2020	24	24	12,294.00
894	6/12/2020	24	24	12,306.00
895	6/13/2020	24	24	12,306.00
896	6/14/2020	24	24	12,323.00
897	6/15/2020	24	24	12,347.00
898	6/16/2020	24	24	12,371.00
899	6/17/2020	19	24	12,381.00
900	6/18/2020	2	24	12,398.00
901	6/19/2020	8	24	12,400.00
902	6/20/2020	24	24	12,408.00
903	6/21/2020	24	23	12,425.00
904	6/22/2020	24	24	12,424.00
905	6/23/2020	24	24	12,424.00
906	6/24/2020	24	24	12,424.00
907	6/25/2020	24	24	12,424.00
908	6/26/2020	24	24	12,424.00
909	6/27/2020	24	24	12,424.00
910	6/28/2020	24	24	12,424.00
911	6/29/2020	24	5	12,424.00
912	6/30/2020	24	24	12,405.00
913	7/1/2020	24	24	12,405.00
914	7/2/2020	24	24	12,405.00
915	7/3/2020	24	24	12,405.00
916	7/4/2020	24	21	12,405.00
917	7/5/2020	22	24	12,402.00
918	7/6/2020	0	24	12,400.00
919	7/7/2020	5	24	12,376.00
920	7/8/2020	24	24	12,357.00
921	7/9/2020	24	24	12,357.00

922	7/10/2020	24	24	12,357.00
923	7/11/2020	24	24	12,357.00
924	7/12/2020	24	24	12,357.00
925	7/13/2020	24	24	12,357.00
926	7/14/2020	24	24	12,357.00
927	7/15/2020	24	24	12,357.00
928	7/16/2020	24	16	12,357.00
929	7/17/2020	24	24	12,349.00
930	7/18/2020	24	24	12,349.00
931	7/19/2020	24	24	12,349.00
932	7/20/2020	24	24	12,356.00
933	7/21/2020	24	24	12,356.00
934	7/22/2020	24	24	12,356.00
935	7/23/2020	24	24	12,356.00
936	7/24/2020	24	24	12,356.00
937	7/25/2020	24	24	12,356.00
938	7/26/2020	24	24	12,356.00
939	7/27/2020	24	24	12,356.00
940	7/28/2020	24	24	12,356.00
941	7/29/2020	24	24	12,356.00
942	7/30/2020	24	24	12,356.00
943	7/31/2020	24	24	12,356.00
944	8/1/2020	24	24	12,356.00
945	8/2/2020	24	24	12,356.00
946	8/3/2020	24	24	12,356.00
947	8/4/2020	24	24	12,356.00
948	8/5/2020	24	24	12,356.00
949	8/6/2020	24	24	12,356.00
950	8/7/2020	24	24	12,356.00
951	8/8/2020	24	0	12,356.00
952	8/9/2020	24	0	12,332.00
953	8/10/2020	24	7	12,308.00
954	8/11/2020	23	23	12,291.00
955	8/12/2020	24	9	12,289.00
956	8/13/2020	24	24	12,274.00
957	8/14/2020	24	24	12,274.00
958	8/15/2020	24	24	12,274.00
959	8/16/2020	24	24	12,274.00
960	8/17/2020	24	24	12,274.00
961	8/18/2020	24	24	12,274.00
962	8/19/2020	24	24	12,274.00
963	8/20/2020	24	24	12,274.00
964	8/21/2020	24	24	12,274.00
965	8/22/2020	24	24	12,274.00
966	8/23/2020	24	24	12,274.00
967	8/24/2020	24	24	12,274.00
968	8/25/2020	24	24	12,274.00
969	8/26/2020	24	24	12,274.00
970	8/27/2020	24	24	12,274.00

971	8/28/2020	24	24	12,274.00
972	8/29/2020	24	24	12,274.00
973	8/30/2020	24	24	12,274.00
974	8/31/2020	24	24	12,274.00
975	9/1/2020	24	24	12,274.00
976	9/2/2020	24	24	12,274.00
977	9/3/2020	24	24	12,274.00
978	9/4/2020	24	24	12,274.00
979	9/5/2020	24	24	12,274.00
980	9/6/2020	24	24	12,274.00
981	9/7/2020	24	24	12,274.00
982	9/8/2020	24	24	12,274.00
983	9/9/2020	24	19	12,274.00
984	9/10/2020	24	24	12,269.00
985	9/11/2020	24	24	12,269.00
986	9/12/2020	24	24	12,269.00
987	9/13/2020	24	24	12,269.00
988	9/14/2020	24	24	12,279.00
989	9/15/2020	24	24	12,303.00
990	9/16/2020	24	24	12,327.00
991	9/17/2020	24	24	12,351.00
992	9/18/2020	24	24	12,375.00
993	9/19/2020	24	24	12,399.00
994	9/20/2020	24	24	12,423.00
995	9/21/2020	24	24	12,447.00
996	9/22/2020	24	24	12,471.00
997	9/23/2020	24	24	12,495.00
998	9/24/2020	24	24	12,519.00
999	9/25/2020	24	24	12,543.00
1000	9/26/2020	24	24	12,558.00
1001	9/27/2020	24	24	12,560.00
1002	9/28/2020	24	24	12,560.00
1003	9/29/2020	24	24	12,560.00
1004	9/30/2020	24	24	12,560.00
1005	10/1/2020	24	24	12,567.00
1006	10/2/2020	24	24	12,567.00
1007	10/3/2020	24	24	12,567.00
1008	10/4/2020	24	24	12,567.00
1009	10/5/2020	24	24	12,567.00
1010	10/6/2020	24	24	12,567.00
1011	10/7/2020	24	24	12,567.00
1012	10/8/2020	24	24	12,567.00
1013	10/9/2020	24	24	12,573.00
1014	10/10/2020	24	24	12,597.00
1015	10/11/2020	24	24	12,621.00
1016	10/12/2020	24	24	12,667.00
1017	10/13/2020	24	24	12,715.00
1018	10/14/2020	24	24	12,763.00
1019	10/15/2020	24	24	12,802.00

1020	10/16/2020	24	24	12,826.00
1021	10/17/2020	24	24	12,850.00
1022	10/18/2020	24	24	12,874.00
1023	10/19/2020	24	24	12,898.00
1024	10/20/2020	24	24	12,922.00
1025	10/21/2020	24	24	12,946.00
1026	10/22/2020	24	24	12,970.00
1027	10/23/2020	24	24	12,994.00
1028	10/24/2020	24	24	13,018.00
1029	10/25/2020	24	24	13,042.00
1030	10/26/2020	24	24	13,066.00
1031	10/27/2020	24	24	13,090.00
1032	10/28/2020	24	24	13,115.00
1033	10/29/2020	24	24	13,139.00
1034	10/30/2020	24	24	13,163.00
1035	10/31/2020	24	24	13,187.00
1036	11/1/2020	24	24	13,211.00
1037	11/2/2020	24	24	13,235.00
1038	11/3/2020	24	24	13,259.00
1039	11/4/2020	24	24	13,283.00
1040	11/5/2020	24	24	13,307.00
1041	11/6/2020	24	24	13,331.00
1042	11/7/2020	24	0	13,355.00
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1067	12/2/2020	24	0	13,355.00
1068	12/3/2020	24	0	13,355.00

1069	12/4/2020	24	0	13,355.00
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1071	12/6/2020	24	24	13,355.00
1072	12/7/2020	24	24	13,379.00
1073	12/8/2020	24	24	13,403.00
1074	12/9/2020	24	24	13,434.00
1075	12/10/2020	24	24	13,478.00
1076	12/11/2020	24	24	13,502.00
1077	12/12/2020	24	24	13,526.00
1078	12/13/2020	24	24	13,550.00
1079	12/14/2020	24	24	13,574.00
1080	12/15/2020	24	24	13,598.00
1081	12/16/2020	24	24	13,622.00
1082	12/17/2020	24	24	13,646.00
1083	12/18/2020	24	24	13,670.00
1084	12/19/2020	24	24	13,694.00
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1087	12/22/2020	24	24	13,766.00
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1091	12/26/2020	24	24	13,862.00
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1093	12/28/2020	24	24	13,910.00
1094	12/29/2020	24	24	13,934.00
1095	12/30/2020	24	24	13,958.00
1096	12/31/2020	24	24	13,982.00
1097	1/1/2021	24	24	14,006.00
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1099	1/3/2021	24	24	14,054.00
1100	1/4/2021	24	24	14,078.00
1101	1/5/2021	24	24	14,102.00
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1103	1/7/2021	24	24	14,164.00
1104	1/8/2021	24	24	14,188.00
1105	1/9/2021	24	24	14,212.00
1106	1/10/2021	24	24	14,236.00
1107	1/11/2021	24	24	14,260.00
1108	1/12/2021	24	24	14,284.00
1109	1/13/2021	24	24	14,308.00
1110	1/14/2021	24	24	14,332.00
1111	1/15/2021	24	24	14,356.00
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1113	1/17/2021	24	24	14,404.00
1114	1/18/2021	24	24	14,421.00
1115	1/19/2021	24	24	14,440.00
1116	1/20/2021	24	24	14,464.00
1117	1/21/2021	24	24	14,472.00

1118	1/22/2021	24	24	14,472.00
1119	1/23/2021	0	24	14,472.00
1120	1/24/2021	0	24	14,448.00
1121	1/25/2021	0	24	14,424.00
1122	1/26/2021	0	24	14,400.00
1123	1/27/2021	0	24	14,376.00
1124	1/28/2021	0	24	14,352.00
1125	1/29/2021	0	24	14,328.00
1126	1/30/2021	0	24	14,304.00
1127	1/31/2021	0	24	14,280.00
1128	2/1/2021	0	24	14,256.00
1129	2/2/2021	0	24	14,232.00
1130	2/3/2021	0	24	14,208.00
1131	2/4/2021	0	24	14,184.00
1132	2/5/2021	0	24	14,160.00
1133	2/6/2021	0	24	14,136.00
1134	2/7/2021	0	24	14,112.00
1135	2/8/2021	0	24	14,088.00
1136	2/9/2021	0	24	14,064.00
1137	2/10/2021	0	24	14,040.00
1138	2/11/2021	0	24	14,038.00
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1140	2/13/2021	0	24	14,024.00
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1142	2/15/2021	0	24	13,976.00
1143	2/16/2021	0	24	13,952.00
1144	2/17/2021	0	24	13,928.00
1145	2/18/2021	0	24	13,904.00
1146	2/19/2021	0	24	13,880.00
1147	2/20/2021	0	24	13,856.00
1148	2/21/2021	0	24	13,832.00
1149	2/22/2021	0	24	13,808.00
1150	2/23/2021	0	24	13,784.00
1151	2/24/2021	0	24	13,760.00
1152	2/25/2021	0	24	13,745.00
1153	2/26/2021	0	24	13,745.00
1154	2/27/2021	0	24	13,745.00
1155	2/28/2021	0	24	13,753.00
1156	3/1/2021	0	24	13,772.00
1157	3/2/2021	0	24	13,772.00
1158	3/3/2021	0	24	13,772.00
1159	3/4/2021	0	24	13,772.00
1160	3/5/2021	0	24	13,772.00
1161	3/6/2021	0	24	13,772.00
1162	3/7/2021	0	24	13,772.00
1163	3/8/2021	0	24	13,772.00
1164	3/9/2021	0	24	13,780.00
1165	3/10/2021	0	24	13,780.00
1166	3/11/2021	0	24	13,780.00

1167	3/12/2021	0	24	13,780.00
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1169	3/14/2021	0	24	13,780.00
1170	3/15/2021	0	24	13,780.00
1171	3/16/2021	0	24	13,780.00
1172	3/17/2021	0	24	13,780.00
1173	3/18/2021	0	24	13,780.00
1174	3/19/2021	0	24	13,780.00
1175	3/20/2021	0	24	13,780.00
1176	3/21/2021	0	24	13,780.00
1177	3/22/2021	0	24	13,780.00
1178	3/23/2021	0	24	13,780.00
1179	3/24/2021	0	24	13,803.00
1180	3/25/2021	0	24	13,827.00
1181	3/26/2021	0	24	13,851.00
1182	3/27/2021	0	24	13,875.00
1183	3/28/2021	0	24	13,899.00
1184	3/29/2021	0	24	13,923.00
1185	3/30/2021	0	24	13,947.00
1186	3/31/2021	0	24	13,971.00
1187	4/1/2021	0	24	13,995.00
1188	4/2/2021	0	24	14,019.00
1189	4/3/2021	0	24	14,043.00
1190	4/4/2021	0	24	14,067.00
1191	4/5/2021	0	24	14,091.00
1192	4/6/2021	0	24	14,115.00
1193	4/7/2021	0	24	14,138.00
1194	4/8/2021	0	24	14,162.00
1195	4/9/2021	0	24	14,176.00
1196	4/10/2021	0	24	14,177.00
1197	4/11/2021	0	24	14,191.00
1198	4/12/2021	0	24	14,201.00
1199	4/13/2021	0	24	14,203.00
1200	4/14/2021	0	24	14,203.00
1201	4/15/2021	0	24	14,200.00
1202	4/16/2021	0	24	14,200.00
1203	4/17/2021	0	24	14,195.00
1204	4/18/2021	0	24	14,191.00
1205	4/19/2021	0	24	14,190.00
1206	4/20/2021	0	24	14,182.00
1207	4/21/2021	0	24	14,173.00
1208	4/22/2021	0	24	14,167.00
1209	4/23/2021	0	24	14,167.00
1210	4/24/2021	0	24	14,163.00
1211	4/25/2021	0	24	14,149.00
1212	4/26/2021	0	24	14,144.00
1213	4/27/2021	0	24	14,143.00
1214	4/28/2021	0	24	14,135.00
1215	4/29/2021	0	24	14,129.00

1216	4/30/2021	0	24	14,105.00
1217	5/1/2021	0	24	14,081.00
1218	5/2/2021	0	24	14,057.00
1219	5/3/2021	0	24	14,033.00
1220	5/4/2021	0	24	14,009.00
1221	5/5/2021	0	24	13,985.00
1222	5/6/2021	0	24	13,961.00
1223	5/7/2021	0	24	13,937.00
1224	5/8/2021	0	24	13,913.00
1225	5/9/2021	24	24	13,889.00
1226	5/10/2021	24	24	13,915.00
1227	5/11/2021	24	24	13,924.00
1228	5/12/2021	24	24	13,924.00
1229	5/13/2021	24	24	13,924.00
1230	5/14/2021	24	24	13,924.00
1231	5/15/2021	24	24	13,924.00
1232	5/16/2021	24	24	13,924.00
1233	5/17/2021	24	24	13,939.00
1234	5/18/2021	24	24	13,939.00
1235	5/19/2021	24	24	13,939.00
1236	5/20/2021	24	24	13,939.00
1237	5/21/2021	24	24	13,939.00
1238	5/22/2021	24	24	13,939.00
1239	5/23/2021	24	24	13,939.00
1240	5/24/2021	24	24	13,939.00
1241	5/25/2021	24	24	13,939.00
1242	5/26/2021	24	24	13,939.00
1243	5/27/2021	24	24	13,941.00
1244	5/28/2021	24	24	13,951.00
1245	5/29/2021	24	24	13,952.00
1246	5/30/2021	24	24	13,952.00
1247	5/31/2021	24	24	13,952.00
1248	6/1/2021	24	24	13,955.00
1249	6/2/2021	24	24	13,975.00
1250	6/3/2021	24	24	14,023.00
1251	6/4/2021	24	24	14,063.00
1252	6/5/2021	24	24	14,074.00
1253	6/6/2021	24	24	14,074.00
1254	6/7/2021	24	24	14,074.00
1255	6/8/2021	24	24	14,074.00
1256	6/9/2021	24	24	14,074.00
1257	6/10/2021	24	24	14,074.00
1258	6/11/2021	24	24	14,074.00
1259	6/12/2021	24	24	14,074.00
1260	6/13/2021	24	24	14,074.00
1261	6/14/2021	24	24	14,074.00
1262	6/15/2021	24	24	14,074.00
1263	6/16/2021	24	24	14,074.00

From:	hayley.fink@hoganlovells.com
To:	Villatora.Liliana@epa.gov
Cc:	Brooks.phillip@Epa.gov; Schaaf.eric@Epa.gov; McHale.Mary@epa.gov; Froikin.Sara@epa.gov; Velez.Hector@epa.gov; Patel.Harish@epa.gov; LuisSierra@jca.pr.gov; Steve.Keller@usdoj.gov; Fink, Hayley; Gutierrez, Ana; Kushner, Adam M.
Subject:	PREPA Response to EPA January 22, 2020 Request for Information
Date:	Tuesday, April 7, 2020 9:54:42 PM

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Dear Liliana:

Hope you're well.

Attached please find the Puerto Rico Electric Power Authority's response to the United States Environmental Protection Agency's January 22, 2020 request for information.

We've attached a complete version of the document (cover letter plus 6 attachments), as well as each component individually due to the large file size of the combined document.

Please use this version as opposed to the version sent earlier this afternoon (which had some attachment numbering issues).

Please let us know if you have any questions.

Sincerely,

Hayley Fink

Hayley J. Fink
Senior Associate
Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004
Tel: +1 202 637 5600
Direct: +1 202 637 6435
Fax: +1 202 637 5910
Email: hayley.fink@hoganlovells.com

www.hoganlovells.com

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Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004
T +1 202 637 5600
F +1 202 637 5910
www.hoganlovells.com

June 16, 2020

By Electronic Mail

Liliana Villatora
Air Branch Chief, Office of Regional Counsel
U.S. Environmental Protection Agency – Region 2
Ted Weiss Federal Building
290 Broadway
New York, NY 10007
villatora.liliana@epa.gov

Re: Puerto Rico Electric Power Authority - Response to EPA Questions Regarding MobilePac Units and Three Shutdown Turbines at the Palo Seco Generating Station

Dear Ms. Villatora:

I write on behalf of the Puerto Rico Electric Power Authority ("PREPA") to provide PREPA's written response to the questions posed by the United States Environmental Protection Agency ("EPA") in its April 24, 2020 email. PREPA initially responded to the below questions during its April 28, 2020 telephone conference with EPA. We reiterate those responses below. In addition, we are providing the requested emissions-related information, which is attached hereto.

Palo Seco MobilePac Units

1. **For each of the three MobilePac units, state the date when each was fired for the first time in 2019.**

   PREPA Response:

Unit	Date and Purpose of First Firing
PS MP-1 ID#1411	November 13, 2019 (start-up testing)
PS MP-2 ID#1410	November 13, 2019 (start-up testing)
PS MP-3 ID#1412	November 07, 2019 (start-up testing)

   PREPA initiated operation of PS MP-1 and PS MP-2 on January 7, 2020, and PS MP-3 on January 8, 2020, following the earthquakes. Prior to that point, the units had only been operated for start-up testing and commissioning purposes.

2. **For each of the three MobilePac units, please provide the actual hours of actual operation, the fuel type burned, and the total number of gallons burned for the month of March and thus far for the month of April, if available by the time a response to these questions is prepared.**

   PREPA Response:

   For the month of March 2020:

Unit	Fuel Burned	Hours of Operation	Gallons of Fuel
PS MP-1 ID#1411	Diesel	741	1,125,669.30
PS MP-2 ID#1410	Diesel	710	1,168,194.30
PS MP-3 ID#1412	Diesel	739	1,173,326.28

   For the month of April 2020:

Unit	Fuel Burned	Hours of Operation	Gallons of Fuel
PS MP-1 ID#1411	Diesel	719	768,387.9
PS MP-2 ID#1410	Diesel	709	769,716.8
PS MP-3 ID#1412	Diesel	681	736,157.1

3. **Page 6 of April 7, 2020 submittal states:**

   a. **PSD limiting pollutant without water injection, burning oil – $PM_{2.5}$ @2,067 hours.**
   b. **PSD limiting pollutant with water injection, burning oil – SO_2 @ 2,209 hours.**
   c. **Does not consider the Jan. emissions from PSGT 3-1.**
   d. **Based on 0.05% sulfur. Actual sulfur is less.**

   According to the Oct. 11, 2019 PREPA letter to DNER and Page 106 of the Dec. 17, 2019 permit application for the MobilePacs, the emission factor for NOx uncontrolled (firing oil, without water injection) is 2.206 lbs. NOx/MMBTU. The above statements about PSD limiting pollutants seem to rely on a NOx emission factor of 0.17 lbs. NOx/MMBTU with water injection. Which NOx emission factor was used in determining the PSD-limiting pollutants above? Please provide the calculations and results for the above numbers for all the pollutants.

   PREPA Response:

   Attached hereto as Attachment A, PREPA is providing the calculations it used to determine the “PSD limiting pollutant.” See Attachment A (“Potential Emissions Calculations Palo Seco MobilePac FT-8 Turbines”). PREPA reviewed the calculations previously provided to EPA, and has revised them to reflect actual fuel usage and quality for PSGT 3-1. The updated calculations indicate that $PM_{2.5}$ is the limiting pollutant for oil, both with and without water injection.

More specifically, PREPA's calculations in Attachment A have been updated to account for the actual emissions of PSGT 3-1 from November 7, 2019 through January 30, 2020, i.e., the emissions of PSGT 3-1 during this period have been subtracted from the estimated allowable emissions for the 3 MobilePac units for the purpose of estimating the allowable hours of operation for this calculation. PREPA's calculations for PSGT 3-1 actual emissions are detailed in Attachment C ("Emissions Calculations Palo Seco PSGT 3-1 Nov 7, 2019 to Jan 30, 2020").

Attachment A identifies PREPA's calculations for both "dry" operation of the MobilePac units, and for operation with water injection. PREPA's estimated emissions calculations applied the emission factor for "NOx uncontrolled" firing to reflect dry operations, and applied the emission factor assuming NOx controlled firing to reflect operations with water injection. For oil operation, these emissions factors were 2.2060 lbs/MMBtu and 0.1730 lbs/MMBtu, respectively.

4. **The Oct. 11, 2019 PREPA letter to DNER requesting a permit waiver states that the NOx emission factor for the 3 MobilePacs will be 2.206 lb NOx/MMBTU at 233 MMBTU/hour heat input when oil firing dry during the waiver period. Has PREPA done anything to these turbines to try to minimize this NOx emission factor to any other lower presumed NOx emission factor without the water injection? If yes, please provide details. Does PREPA still expect the water injection control to be online on or about the end of May 2020? If not, provide the current expected date.**

   PREPA Response:

   The installation of the water injection system was scheduled to be completed the week of May 10, 2020. Due to the COVID-19 pandemic restrictions, PREPA now estimates that the installation of the water injection system will be completed the week of July 13, 2020, assuming no further delays associated with COVID-19.

5. **In the Dec. 17, 2019 permit application for the MobilePacs, PREPA proposed annual emission limits for the 3 turbines and the 3 black start generators (BSGs). Is PREPA still expecting to meet these proposed emission limits or is it expecting to use the "netting allowable limits" as permit limits?**

   PREPA Response:

   Due to the earthquake emergency, PREPA does not expect to meet the proposed permit limits in the first year of operation of the MobilePac units. In future years, PREPA expects to meet the emission limits as proposed in the permit application. PREPA notes that the current need to utilize the MobilePac units was not expected at the time of its permit application, and is directly attributable to meeting the island's power needs in the wake of the January 7, 2020 earthquakes, which caused Cost Sur Units 5 and 6 and two Mayaguez units to be unavailable.

6. **Can PREPA still be able to operate within the constraints of either of the annual limits in Question 5 above for the 3 MobilePac units and the 3 BSGs without triggering PSD? Please provide a revised netting analysis (with calculations) using the 2.206 lb NOx/MMBTU emission factor and any revised emission factors for the other pollutants, assuming no water injection.**

   PREPA Response:

   As noted above, due to the earthquake emergency, PREPA does not expect to meet the proposed annual limits in the first year of operation of the units. In future years, PREPA expects to operate the MobilePac units to meet the emission limits as proposed in the permit application. PREPA reiterates that the current need to utilize the MobilePac units was not expected at the time of its permit application, and is directly attributable to meeting the island's power needs in the wake of the January 7, 2020 earthquakes, which caused Cost Sur Units 5 and 6 and two Mayaguez units to be unavailable.

<u>PSGT 2-2, PSGT 3-1, and PSGT 3-2</u>

7. **Page 8 and <u>Appendix B</u> of the Dec. 17, 2019 submittal describe the total "actual emissions" that is used for netting purposes from the shutdown of these 3 turbines combined for the period of May 2016 through 2018. In a table form, please provide the same "actual emissions" for each pollutant for each of these 3 turbines separately.**

   PREPA Response:

   The requested information is attached hereto as Attachment B ("Palo Seco Baseline Actual Emissions by Unit").

8. **For each of these three turbines provide the dates when they were permanently shut down and describe the steps taken to render each of them permanently shut down/disabled (i.e., cancelling/revising the DNER permits, dismantling the units, disconnecting the fuel supply, etc.).**

   PREPA Response:

   PSGT 2-2: This unit has been out-of-service since September 25, 2018, due to an exhaust duct failure. To render Unit PSGT 2-2 inoperable, PREPA removed the starting motor and auxiliary equipment on or about February 2019.

PSGT 3-1: This unit has been out-of-service since January 30, 2020. To render Unit PSGT 3-1 inoperable, PREPA removed the starting motor and auxiliary equipment on or about February 2020.

PSGT 3-2: This unit has been out-of-service since September 26, 2016 due to high temperature on the gear reductor and high bearing vibration. To render Unit PSGT 3-2 inoperable, PREPA removed the generator, starting motor, and auxiliary equipment on or about January 2019.

9. Was turbine PSGT 3-1 ever permanently disconnected from service prior to the initial firing of the first MobilePac unit in 2019? If yes, please describe what was done.

PREPA Response:

No. The MobilePac units were installed pursuant to an emergency variance waiver issued by the Puerto Rico Department of Natural and Environmental Resources ("PRDNER") under the authority of the Puerto Rico Regulation for the Control of Atmospheric Pollution ("PRRCAP") Rule 302; the issuance of the waiver was not conditioned on the shutdown of PSGT 3-1. In January 2020, PREPA submitted an application to PRDNER for a permit to construct the MobilePac units. In its application, PREPA indicates that it would take a permanent shutdown of each of the three units in order to be able to apply emission credits attributable to the retirement of those units to the MobilePac units.

10. Indicate what was required to bring turbine PSGT 3-1 back into service on January 7, 2020, including physical changes and permit-related activities and requests made to DNER.

PREPA Response:

Prior to January 7, 2020, PSGT 3-1's last in-service date was December 30, 2019.
PSGT 3-1 was returned to service on January 7, 2020, and remained in service until January 30, 2020, as it was needed to meet demand and assist in grid recovery after the earthquakes that rendered Costa Sur Units 5 and 6 and two of the Mayaguez units inoperable.

11. **PREPA states that PSGT 3-1 was taken out of service on January 30, 2020, and will remain out of service because PREPA is relying on netting credits from this unit. Is this turbine permanently disconnected and has the DNER permit been revoked? Please provide a copy of PREPA's request for the permit revocation or revision if one was submitted to DNER. Describe what "remain out of service" means. What steps would be required to bring this unit back on-line and how long would it take and what costs would be incurred to bring it back on-line?**

    PREPA Response:

    PREPA has not yet requested a permit revocation for PSGT 3-1, as its construction permit application for the MobilePac units is still under evaluation by PRDNER. As described above, PREPA has rendered the unit inoperable by removing the starting motor and auxiliary equipment from the unit, and it will remain out of service.

    Significant work would be required on each of the three turbine units in order to be able to return them to service. PREPA estimates that the work needed to return these units to service would take approximately six to twelve weeks assuming the availability of equipment. For Unit PSGT 3-2, the time estimate is expected to be closer to 12 weeks because the generator was removed from that unit. For the other two units, the time estimate is expected to be closer to 6 weeks. Assuming the availability of in-house technical resources, PREPA estimates the required work would cost in the range of ~$200,000 to ~$250,000.

12. **With respect to PSGT 3-1, provide the hours of operation, type of fuel burned, total gallons of fuel burned, and emissions for each criteria pollutant and total GHG (in CO_2e) pollutants from the period after the initial startup date of the first MobilePac unit through the shutdown of PSGT 3-1 on Jan. 30, 2020.**

    PREPA Response:

    As noted above, November 7, 2019 was the date that the first MobilePac unit underwent start-up testing. Accordingly, in the table below, PREPA provides the hours of operation of PSGT 3-1 from November 7, 2019 through January 30, 2020.

Unit	Month and Year	Hours of Operation	Fuel Usage (Gals)	Fuel Type
PSGT 3-1	November 7 to 30, 2019	79.1	78.834	Fuel Oil No. 2
	December 2019	130.69	265,621	Fuel Oil No. 2
	January 2020	562.8	1,115,457	Fuel Oil No. 2

The requested emissions information is attached hereto as Attachment C ("Emissions Calculations Palo Seco PS GT 3-1 Nov 7_2019 to Jan 30_2020").

Please let us know if you have any questions regarding the above responses or require additional information.

Respectfully submitted,

Adam M. Kushner
Partner
adam.kushner@hoganlovells.com
D +1 202 637 5724

Cc: Mr. Joseph Siegel, United States Environmental Protection Agency, Region 2

Mr. Luis Sierra, Puerto Rico Department of Natural and Environmental Resources

Enclosures:

Attachment A – Potential Emissions Calculations Palo Seco MobilePac FT-8 Turbines
Attachment B – Palo Seco Baseline Actual Emissions by Unit
Attachment C – Emissions Calculations Palo Seco PSGT 3-1 Nov 7, 2019 to Jan 30, 2020

Attachment A

Potential Emissions Calculations for Palo Seco MobilePac FT-8 Turbines

PALO SECO TURBINES FT-8 MOBILEPAC (3 UNITS) - DRY										
Pollutant	PSGT 2-2, 3-1, 3-2 Baseline Emissions (tpy)	PSD Significance (tpy)	PS GT 3-1 Actuals (November 7, 2019 to January 30, 2020)	PW FT8 Allowable Emissions (tpy)	PW FT8 Emissions Gas (lb/MMBtu)	PW FT8 Allowable Gas (MMBtu/yr)	PW FT8 Allowable Gas (hr/yr)	PW FT8 Emissions Oil (lb/MMBtu)	PW FT8 Allowable Oil (MMBtu/yr)	PW FT8 Allowable Oil (hr/yr)
NOx	718.4	40	88.65	669.65	0.8373	1 599 553	6 347	2.2060	607 118	2 606
PM	9.8	25	1.21	33.49	0.0233	2 870 674	11 392	0.0773	867 050	3 721
PM10	9.8	15	1.21	23.49	0.0233	2 013 531	7 990	0.0773	608 161	2 610
PM2.5	9.8	10	1.21	18.49	0.0233	1 584 959	6 290	0.0773	478 716	2 055
SO2	19.8	40	3.66	56.04	0.0152	7 393 326	29 339	0.0554	2 022 704	8 681
VOC	0.33	40	0.04	40.2	0.0013	59 573 836	236 404	0.0072	11 147 580	47 844
CO	2.69	100	0.33	102.3	0.0210	9 724 117	38 588	0.0352	5 811 223	24 941
H2SO4	3.04	7	0.56	9.38	0.0023	8 082 371	32 073	0.0085	2 211 217	9 490
Lead		0.6	0.001410275	0.498589725				0.000014	71 227 104	305 696
CO2e (tpy)	133 596	75 000	16 484	192 112	116.98	3 284 524	13 034	163.64	2 347 981	0 077

NOTES:
1) PW FT8 Allowable Emissions (tpy) are equal to baseline emissions for PSGT 2-2 3-1 and 3-2 plus PSD Significance Threshold
2) PW FT8 Emissions (lb/MMBtu) are based upon PW FT8 performance data at 85°F
3) PW FT8 Allowable (MMBtu/yr) based upon a lowable emissions (tpy) and emission rates (b/MMBtu) for each po lutant
4) PW FT8 Allowable (hr/yr) are total hours for all three proposed PW FT8 Turbines based on allowable (MMBtu/yr) and rated fring rate at 85°F
5) Natural Gas Sulfur Content 5.0 gr/100dscf
6) Fuel Oil Sulfur Content .05 % per wt
7) SO2 emissions based upon fuel sulfur content imits
8) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
9) CO2e emissions from 40 CFR 98 Subchapter C Tables 1 and 2
10) NOx emissions compliance with 1.2 lb/MWhr standard
11) Heating Value Fuel O l .138 MMBtu/Gal
12) Heating Value Natural Gas .00 02 MMBtu/SCF

PALO SECO TURBINES FT-8 MOBILEPAC DIESEL OPERATION - DRY				
POLLUTANT	EMISSION FACTOR	UNITS	EMISSION FACTOR	UNITS
PM	18	Lbs/Hr	0.07725	Lbs/MMBtu
PM10	18	Lbs/Hr	0.07725	Lbs/MMBtu
PM2.5	18	Lbs/Hr	0.07725	Lbs/MMBtu
SOx	12.91	Lbs/Hr	0.05541	Lbs/MMBtu
NOx	514	Lbs/Hr	2.20601	Lbs/MMBtu
VOC	1.68	Lbs/Hr	0.00721	Lbs/MMBtu
CO	8.2	Lbs/Hr	0.03519	Lbs/MMBtu
H2SO4 (Mass Bal.)			0.00848	Lbs/MMBtu
Pb (AP-42)			0.0000140	Lbs/MMBtu
HEAT INPUT	233	MMBTU/Hr		
PALO SECO TURBINES FT-8 MOBILEPAC NATURAL GAS OPERATION - DRY				
POLLUTANT	EMISSION FACTOR	UNITS	EMISSION FACTOR	UNITS
PM	5.88	Lbs/Hr	0.0233	Lbs/MMBtu
PM10	5.88	Lbs/Hr	0.0233	Lbs/MMBtu
PM2.5	5.88	Lbs/Hr	0.0233	Lbs/MMBtu
SOx (Mass Bal.)	3.82	Lbs/Hr	0.0152	Lbs/MMBtu
NOx	211	Lbs/Hr	0.8373	Lbs/MMBtu
VOC	0.34	Lbs/Hr	0.0013	Lbs/MMBtu
CO	5.3	Lbs/Hr	0.02103	Lbs/MMBtu
H2SO4 (Mass Bal.)			0.00232	Lbs/MMBtu
HEAT INPUT	252	MMBTU/Hr		

PALO SECO TURBINES FT-8 MOBILEPAC (3 UNITS) - WATER INJECTION										
Pollutant	PSGT 2-2, 3-1, 3-2 Baseline Emissions (tpy)	PSD Significance (tpy)	PS GT 3-1 Actuals (November 7, 2019 to January 30, 2020)	PW FT8 Allowable Emissions (tpy)	PW FT8 Emissions Gas (lb/MMBtu)	PW FT8 Allowable Gas (MMBtu/yr)	PW FT8 Allowable Gas (hr/yr)	PW FT8 Emissions Oil (lb/MMBtu)	PW FT8 Allowable Oil (MMBtu/yr)	PW FT8 Allowable Oil (hr/yr)
NOx	718.4	40	88.65	669.65	0.1099	12 186 051	41 337	0.17 0	7 743 388	27 333
PM	9.8	25	1.21	33.49	0.0102	6 582 136	22 327	0.0176	3 795 222	13 396
PM10	9.8	15	1.21	23.49	0.0102	4 616 802	15 661	0.0176	2 662 022	9 396
PM2.5	9.8	10	1.21	18.49	0.0102	3 634 136	12 327	0.0176	2 095 422	7 396
SO2	19.8	40	3.66	56.04	0.0140	7 999 818	27 1 6	0.0505	2 220 308	7 837
VOC	0.33	40	0.04	40.2	0.0051	15 692 223	53 2 0	0.0071	11 272 731	39 791
CO	2.69	100	0.33	102.3	0.0767	2 667 746	9 049	0.0342	5 973 108	21 084
H2SO4	3.04	7	0.56	9.38	0.0021	8 745 387	29 665	0.0077	2 427 237	8 568
Lead	????	0.6	0.001410275	0.498589725				0.000014	71 227 104	251 419
CO2e (tpy)	133 596	75 000	16 484	192 112	116.98	3 284 524	11 142	163.64	2 347 981	8 288

NOTES:
1) PW FT8 Allowable Emissions (tpy) are equal to baseline emissions for PSGT 2-2 3-1 and 3-2 plus PSD Significance Threshold
2) PW FT8 Emissions (lb/MMBtu) are based upon PW FT8 performance data at 85°F
3) PW FT8 Allowable (MMBtu/yr) based upon a lowable emissions (tpy) and emission rates (b/MMBtu) for each po lutant
4) PW FT8 Allowable (hr/yr) are total hours for all three proposed PW FT8 Turbines based on allowable (MMBtu/yr) and rated fring rate at 85°F
5) Natural Gas Sulfur Content 5.0 gr/100dscf
6) Fuel Oil Sulfur Content .05 % per wt
7) SO2 emissions based upon fuel sulfur content imits
8) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
9) CO2e emissions from 40 CFR 98 Subchapter C Tables 1 and 2
10) NOx emissions compliance with 1.2 lb/MWhr standard
11) Heating Value Fuel O l .138 MMBtu/Gal
12) Heating Value Natural Gas .00 02 MMBtu/SCF

PALO SECO TURBINES FT-8 MOBILEPAC DIESEL OPERATION				
POLLUTANT	EMISSION FACTOR	UNITS	EMISSION FACTOR	UNITS
PM	5	Lbs/Hr	0.0176	Lbs/MMBtu
PM10	5	Lbs/Hr	0.0176	Lbs/MMBtu
PM2.5	5	Lbs/Hr	0.0176	Lbs/MMBtu
SOx	14.3	Lbs/Hr	0.0505	Lbs/MMBtu
NOx	49	Lbs/Hr	0.1730	Lbs/MMBtu
VOC	2.02	Lbs/Hr	0.0071	Lbs/MMBtu
CO	9.7	Lbs/Hr	0.0342	Lbs/MMBtu
H2SO4 (Mass Bal.)			0.0077	Lbs/MMBtu
Pb (AP-42)			0.0000140	Lbs/MMBtu
HEAT INPUT	283.3	MMBTU/Hr		
PALO SECO TURBINES FT-8 MOBILEPAC NATURAL GAS OPERATION				
POLLUTANT	EMISSION FACTOR	UNITS	EMISSION FACTOR	UNITS
PM	3	Lbs/Hr	0.0102	Lbs/MMBtu
PM10	3	Lbs/Hr	0.0102	Lbs/MMBtu
PM2.5	3	Lbs/Hr	0.0102	Lbs/MMBtu
SOx (Mass Bal.)	4.13	Lbs/Hr	0.0140	Lbs/MMBtu
NOx	32.4	Lbs/Hr	0.1099	Lbs/MMBtu
VOC	1.51	Lbs/Hr	0.0051	Lbs/MMBtu
CO	22.6	Lbs/Hr	0.0767	Lbs/MMBtu
H2SO4 (Mass Bal.)			0.00214	Lbs/MMBtu
HEAT INPUT	294.8	MMBTU/Hr		

Attachment B

Palo Seco Baseline
Actual Emissions Per Unit

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Baseline Emissions Per Unit Summary							
	NOx	PM/PM10/PM2.5	SO2	H2SO4	CO	VOC	GHGs
Unit ID	**(tons)**	**(tons)**	**(tons)**	**(tons)**	**(tons)**	**(tons)**	**(tons)**
2-2	346.29	4.72	9.73	1.49	1.30	0.16	64,395
3-1	327.97	4.47	8.62	1.32	1.23	0.15	60,988
3-2	44.17	0.60	1.26	0.19	0.17	0.02	8,213
Baseline	**718.43**	**9.80**	**19.61**	**3.00**	**2.69**	**0.33**	**133,596**

AP-42 Section 3.1 Emission Factors (lb/MMBtu): NOx = 0.88; PM = 0.012; SO2 = 1.01 x %S; CO = 0.0033; VOC = 0.00041

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data						PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Baseline Monthly Emissions Per Unit						
						NOx	PM/PM10/PM2.5	SO2	H2SO4	CO	VOC	GHGs
Plant	Unit ID	Month	Oil Consumption (bbls)	Sulfur (%)		(tons)	(tons)	(tons)	(tons)	(tons)	(tons)	(tons)
Palo Seco	PSGT2-2	May-16	6094	0.0194		15.5	0.21	0.35	0.05	0.06	0.01	2,890.0
Palo Seco	PSGT2-2	Jun-16	2116	0.0200		5.4	0.07	0.12	0.02	0.02	0.00	1,003.5
Palo Seco	PSGT2-2	Jul-16	16733	0.0302		42.7	0.58	1.48	0.23	0.16	0.02	7,935.3
Palo Seco	PSGT2-2	Aug-16	13538	0.0224		34.5	0.47	0.89	0.14	0.13	0.02	6,420.2
Palo Seco	PSGT2-2	Sep-16	7646	0.0214		19.5	0.27	0.48	0.07	0.07	0.01	3,626.0
Palo Seco	PSGT2-2	Oct-16	2509.67	0.0160		6.4	0.09	0.12	0.02	0.02	0.00	1,190.2
Palo Seco	PSGT2-2	Nov-16	0	0.0000		0.0	0.00	0.00	0.00	0.00	0.00	0.0
Palo Seco	PSGT2-2	Dec-16	0	0.0000		0.0	0.00	0.00	0.00	0.00	0.00	0.0
Palo Seco	PSGT2-2	Jan-17	1535.83	0.0160		3.9	0.05	0.07	0.01	0.01	0.00	728.3
Palo Seco	PSGT2-2	Feb-17	2343.28	0.0156		6.0	0.08	0.11	0.02	0.02	0.00	1,111.3
Palo Seco	PSGT2-2	Mar-17	804.78	0.0133		2.1	0.03	0.03	0.00	0.01	0.00	381.7
Palo Seco	PSGT2-2	Apr-17	3456.09	0.0133		8.8	0.12	0.13	0.02	0.03	0.00	1,639.0
Palo Seco	PSGT2-2	May-17	6760.31	0.0102		17.2	0.24	0.20	0.03	0.06	0.01	3,206.0
Palo Seco	PSGT2-2	Jun-17	8236.43	0.0060		21.0	0.29	0.15	0.02	0.08	0.01	3,906.0
Palo Seco	PSGT2-2	Jul-17	14722.08	0.0042		37.5	0.51	0.18	0.03	0.14	0.02	6,981.7
Palo Seco	PSGT2-2	Aug-17	30638.6	0.0066		78.1	1.07	0.59	0.09	0.29	0.04	14,529.8
Palo Seco	PSGT2-2	Sep-17	11217.16	0.0255		28.6	0.39	0.84	0.13	0.11	0.01	5,319.5
Palo Seco	PSGT2-2	Oct-17	29990.11	0.0339		76.5	1.04	2.98	0.46	0.29	0.04	14,222.3
Palo Seco	PSGT2-2	Nov-17	31816.05	0.0451		81.1	1.11	4.20	0.64	0.30	0.04	15,088.2
Palo Seco	PSGT2-2	Dec-17	24213.97	0.0352		61.8	0.84	2.50	0.38	0.23	0.03	11,483.1
Palo Seco	PSGT2-2	Jan-18	19015.35	0.0320		48.5	0.66	1.78	0.27	0.18	0.02	9,017.7
Palo Seco	PSGT2-2	Feb-18	14030.3	0.0188		35.8	0.49	0.77	0.12	0.13	0.02	6,653.6
Palo Seco	PSGT2-2	Mar-18	13186.57	0.0243		33.6	0.46	0.94	0.14	0.13	0.02	6,253.5
Palo Seco	PSGT2-2	Apr-18	10972.54	0.0175		28.0	0.38	0.56	0.09	0.10	0.01	5,203.5
					2-2	**346.3**	**4.7**	**9.7**	**1.5**	**1.3**	**0.2**	**64,395.2**
Palo Seco	PSGT3-1	May-16	5962	0.0194		15.2	0.21	0.34	0.05	0.06	0.01	2,827.4
Palo Seco	PSGT3-1	Jun-16	1525	0.0200		3.9	0.05	0.09	0.01	0.01	0.00	723.2
Palo Seco	PSGT3-1	Jul-16	16375	0.0299		41.8	0.57	1.43	0.22	0.16	0.02	7,765.6
Palo Seco	PSGT3-1	Aug-16	13663	0.0221		34.8	0.48	0.89	0.14	0.13	0.02	6,479.4
Palo Seco	PSGT3-1	Sep-16	7885	0.0214		20.1	0.27	0.49	0.08	0.08	0.01	3,739.3
Palo Seco	PSGT3-1	Oct-16	2563.48	0.0160		6.5	0.09	0.12	0.02	0.02	0.00	1,215.7
Palo Seco	PSGT3-1	Nov-16	159.62	0.0160		0.4	0.01	0.01	0.00	0.00	0.00	75.7
Palo Seco	PSGT3-1	Dec-16	243.24	0.0160		0.6	0.01	0.01	0.00	0.00	0.00	115.4
Palo Seco	PSGT3-1	Jan-17	1536.21	0.0160		3.9	0.05	0.07	0.01	0.01	0.00	728.5
Palo Seco	PSGT3-1	Feb-17	2224.12	0.0155		5.7	0.08	0.10	0.02	0.02	0.00	1,054.8
Palo Seco	PSGT3-1	Mar-17	895.64	0.0133		2.3	0.03	0.03	0.01	0.01	0.00	424.7
Palo Seco	PSGT3-1	Apr-17	3230.55	0.0133		8.2	0.11	0.13	0.02	0.03	0.00	1,532.0
Palo Seco	PSGT3-1	May-17	6066.52	0.0102		15.5	0.21	0.18	0.03	0.06	0.01	2,876.9
Palo Seco	PSGT3-1	Jun-17	12480.3	0.0060		31.8	0.43	0.22	0.03	0.12	0.01	5,918.6
Palo Seco	PSGT3-1	Jul-17	13099.23	0.0042		33.4	0.46	0.16	0.02	0.13	0.02	6,212.1
Palo Seco	PSGT3-1	Aug-17	23686.57	0.0069		60.4	0.82	0.48	0.07	0.23	0.03	11,232.9
Palo Seco	PSGT3-1	Sep-17	19769.71	0.0268		50.4	0.69	1.55	0.24	0.19	0.02	9,375.4
Palo Seco	PSGT3-1	Oct-17	14154.29	0.0340		36.1	0.49	1.41	0.22	0.14	0.02	6,712.4
Palo Seco	PSGT3-1	Nov-17	16565.71	0.0450		42.2	0.58	2.18	0.33	0.16	0.02	7,856.0
Palo Seco	PSGT3-1	Dec-17	21228.84	0.0364		54.1	0.74	2.26	0.35	0.20	0.03	10,067.4
Palo Seco	PSGT3-1	Jan-18	27917.61	0.0291		71.2	0.97	2.38	0.36	0.27	0.03	13,239.4
Palo Seco	PSGT3-1	Feb-18	27419.37	0.0190		69.9	0.95	1.53	0.23	0.26	0.03	13,003.2
Palo Seco	PSGT3-1	Mar-18	11488.4	0.0244		29.3	0.40	0.82	0.13	0.11	0.01	5,448.2
Palo Seco	PSGT3-1	Apr-18	7066.59	0.0177		18.0	0.25	0.37	0.06	0.07	0.01	3,351.2
					3-1	**328.0**	**4.5**	**8.6**	**1.3**	**1.2**	**0.2**	**60,987.8**

AP-42 Section 3.1 Emission Factors (lb/MMBtu): NOx = 0.88; PM = 0.012; SO2 = 1.01 x %S; CO = 0.0033; VOC = 0.00041

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data				
Plant	Unit ID	Month	Oil Consumption (bbls)	Sulfur (%)
Palo Seco	PSGT3-2	May-16	5483	0.0194
Palo Seco	PSGT3-2	Jun-16	1797	0.0200
Palo Seco	PSGT3-2	Jul-16	13642	0.0302
Palo Seco	PSGT3-2	Aug-16	11844	0.0224
Palo Seco	PSGT3-2	Sep-16	1810	0.0212
Palo Seco	PSGT3-2	Oct-16	63.1	0.0160
Palo Seco	PSGT3-2	Nov-16	0	0.0000
Palo Seco	PSGT3-2	Dec-16	0	0.0000
Palo Seco	PSGT3-2	Jan-17	0	0.0000
Palo Seco	PSGT3-2	Feb-17	0	0.0000
Palo Seco	PSGT3-2	Mar-17	0	0.0000
Palo Seco	PSGT3-2	Apr-17	0	0.0133
Palo Seco	PSGT3-2	May-17	0	0.0000
Palo Seco	PSGT3-2	Jun-17	0	0.0000
Palo Seco	PSGT3-2	Jul-17	0	0.0000
Palo Seco	PSGT3-2	Aug-17	0	0.0000
Palo Seco	PSGT3-2	Sep-17	0	0.0000
Palo Seco	PSGT3-2	Oct-17	0	0.0000
Palo Seco	PSGT3-2	Nov-17	0	0.0000
Palo Seco	PSGT3-2	Dec-17	0	0.0000
Palo Seco	PSGT3-2	Jan-18	0	0.0000
Palo Seco	PSGT3-2	Feb-18	0	0.0000
Palo Seco	PSGT3-2	Mar-18	0	0.0000
Palo Seco	PSGT3-2	Apr-18	0	0.0000

	PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Baseline Monthly Emissions Per Unit						
	NOx	PM/PM10/PM2.5	SO2	H2SO4	CO	VOC	GHGs
	(tons)	(tons)	(tons)	(tons)	(tons)	(tons)	(tons)
	14.0	0.19	0.31	0.05	0.05	0.01	2,600.2
	4.6	0.06	0.11	0.02	0.02	0.00	852.2
	34.8	0.47	1.21	0.18	0.13	0.02	6,469.5
	30.2	0.41	0.78	0.12	0.11	0.01	5,616.8
	4.6	0.06	0.11	0.02	0.02	0.00	858.4
	0.2	0.00	0.00	0.00	0.00	0.00	29.9
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
	0.0	0.00	0.00	0.00	0.00	0.00	0.0
3-2	**44.2**	**0.6**	**1.3**	**0.2**	**0.2**	**0.0**	**8,213.5**

Attachment C

Emission Calculations Palo Seco PSGT 3-1
November 7, 2019 to January 30, 2020

Actual Emissions November 7, 2019 to January 30, 2020 - Palo Seco GT 3-1

AP-42 Emission Factors		
PM	0.012	lb/MMBtu
SOx	1.01*%S	lb/MMBtu
NOx	0.88	lb/MMBtu
VOC	0.00041	lb/MMBtu
CO	0.0033	lb/MMBtu
HAP,s (Pb)	0.000014	lb/MMBtu

Fuel Oil #2	1,459,912.46	gal/yr
Sulfur %	0.04	

Actuals (Tons)	Pollutant
1.21	PM
3.66	SOx
88.65	NOx
0.04	VOC
0.33	CO
0.0014	HAP,s (Pb)
0.56	H2SO4
16484	CO2e

Emission Calculations PM

$$= \frac{0.012 \text{ lb}}{\text{MMBTU}} \left| \frac{1,459,912 \text{ gal}}{\text{yr}} \right| \frac{0.138 \text{ MMBTU}}{\text{gal}} \left| \frac{\text{ton}}{2000 \text{ lb}} \right|$$

$$= 1.21 \ \frac{\text{ton}}{\text{yr}} \quad = \quad 0.28 \ \frac{\text{lb}}{\text{hr}}$$

Emission Calculations SOx

$$= \frac{0.04 \text{ lb}}{\text{MMBTU}} \left| \frac{1,459,912 \text{ gal}}{\text{yr}} \right| \frac{0.138 \text{ MMBTU}}{\text{gal}} \left| \frac{\text{ton}}{2000 \text{ lb}} \right|$$

$$= 3.66 \ \frac{\text{ton}}{\text{yr}} \quad = \quad 0.84 \ \frac{\text{lb}}{\text{hr}}$$

Emission Calculations NOx

$$= \frac{0.88 \text{ lb}}{\text{MMBTU}} \left| \frac{1,459,912 \text{ gal}}{\text{yr}} \right| \frac{0.138 \text{ MMBTU}}{\text{gal}} \left| \frac{\text{ton}}{2000 \text{ lb}} \right|$$

$$= 88.65 \ \frac{\text{ton}}{\text{yr}} \quad = \quad 20.24 \ \frac{\text{lb}}{\text{hr}}$$

Emission Calculations VOC

$$= \frac{0.00041 \text{ lb}}{\text{MMBTU}} \left| \frac{1,459,912 \text{ gal}}{\text{yr}} \right| \frac{0.138 \text{ MMBTU}}{\text{gal}} \left| \frac{\text{ton}}{2000 \text{ lb}} \right|$$

$$= 0.04 \ \frac{\text{ton}}{\text{yr}} \quad = \quad 0.01 \ \frac{\text{lb}}{\text{hr}}$$

Emission Calculations CO

$$= \frac{0.0033 \text{ lb}}{\text{MMBTU}} \left| \frac{1,459,912 \text{ gal}}{\text{yr}} \right| \frac{0.138 \text{ MMBTU}}{\text{gal}} \left| \frac{\text{ton}}{2000 \text{ lb}} \right|$$

$$= 0.33 \ \frac{\text{ton}}{\text{yr}} \quad = \quad 0.08 \ \frac{\text{lb}}{\text{hr}}$$

Emission Calculations Pb

$$= \frac{0.000014 \text{ lb}}{\text{MMBTU}} \left| \frac{1,459,912 \text{ gal}}{\text{yr}} \right| \frac{0.138 \text{ MMBTU}}{\text{gal}} \left| \frac{\text{ton}}{2000 \text{ lb}} \right|$$

$$= 0.0014 \ \frac{\text{ton}}{\text{yr}} \quad = \quad 0.000 \ \frac{\text{lb}}{\text{hr}}$$

Emission Calculations CO2e

$$= \frac{163.64 \text{ lb}}{\text{MMBTU}} \left| \frac{1,459,912 \text{ gal}}{\text{yr}} \right| \frac{0.138 \text{ MMBTU}}{\text{gal}} \left| \frac{\text{ton}}{2000 \text{ lb}} \right|$$

$$= 16484.105 \ \frac{\text{ton}}{\text{yr}} \quad = \quad 3763.494 \ \frac{\text{lb}}{\text{hr}}$$

From: Hayley Fink (via Egress Web Access)
To: Prentice.Amanda@epa.gov; Patel.Harish@epa.gov; Villatora.Liliana@epa.gov; Rivera.Alex@epa.gov; Buettner.Robert@epa.gov; Lonergan.Ralph@epa.gov; Kushner, Adam M.; McHale.Mary@epa.gov; Siegel.Joseph@epa.gov; Caballero.Kathryn@epa.gov; Jon.Frank@epa.gov; LaVigna.Gaetano@epa.gov
Subject: Puerto Rico Electric Power Authority - Palo Seco Mobile Pac Documents
Date: Sunday, March 28, 2021 4:37:15 AM

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Hogan Lovells

Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004
T +1 202 637 5600
F +1 202 637 5910
www.hoganlovells.com

May 26, 2021

Via Electronic Mail

Ms. Liliana Villatora
Chief, Air Branch
Office of Regional Counsel
United States Environmental Protection Agency, Region 2
290 Broadway
New York, NY 10007-1866

Ms. Amanda Prentice
Assistant Regional Counsel
Office of Regional Counsel
United States Environmental Protection Agency, Region 2
290 Broadway
New York, NY 10007-1866

Re: Puerto Rico Electric Power Authority – Equitable Considerations Surrounding Palo Seco MobilePac Units

To Whom It May Concern:

On January 22, 2021, the United States Environmental Protection Agency ("EPA") issued a Notice of Violation and Opportunity to Confer ("NOVOC") regarding the Puerto Rico Electric Power Authority's ("PREPA") installation of three ~23 MW MobilePac combustion turbine units ("MobilePac Units") to replace three existing units in the Palo Seco Power Block. PREPA subsequently requested an opportunity to confer with EPA, and PREPA and EPA have since engaged in several conversations. As a part of these discussions, on April 12, 2021, EPA requested that PREPA identify equitable factors for EPA's consideration concerning the installation of the MobilePac Units and the opportunity to credit the retirement of one of the Palo Seco Power Block units (Unit PSGT 3-1). Through this letter, PREPA provides the information requested by EPA, and looks forward to receiving EPA's guidance on a pathway forward to ensure the availability of the MobilePac Units as soon as possible, as PREPA approaches the 2021 hurricane season.

I. PREPA's Installation of the MobilePac Units in the Context of Natural Disasters

Following Hurricanes Irma and Maria in September 2017, PREPA's system was decimated, resulting in island-wide blackouts and power losses on portions of the island for close to nine months. PREPA's immediate recovery extended nearly a year, but its system was left weakened and vulnerable, with the threat of additional hurricanes looming.

Accordingly, as the 2019 hurricane season approached, PREPA sought to install the three Palo Seco MobilePac Units to provide emergency backup power in the event of a hurricane. In coordination with the Puerto Rico Department of Natural and Environmental Resources ("DNER"), PREPA applied to DNER for an emergency variance to install the three units pursuant to Rule 302 of the Puerto Rico Regulation for the Control of Atmospheric Pollution. Under Rule 302, DNER "may grant emergency variances only under very special circumstances, e.g., to avoid an imminent health threat." On October 24, 2019, DNER granted the requested emergency variance for 90 days, deeming the status of PREPA's system and the limitations on its generation resources serious enough to meet this standard, and determining that the situation affected the resilience of Puerto Rico's electricity system. Under Rule 302, DNER was required to inform EPA of its decision to grant the emergency variance. The emergency variance allowed for PREPA to install the three MobilePac units without first applying for and obtaining a DNER-issued construction permit. Before the 90 days expired, PREPA applied for a construction permit for the units.

While no hurricane hit the island during the 2019 hurricane season, hundreds of earthquakes struck the island beginning in December 2019. In January 2020, Puerto Rico suffered an island-wide blackout when a large earthquake struck on January 7, 2020, damaging units at the Mayaguez and San Juan Power Plants and rendering the Costa Sur Power Plant inoperable. Costa Sur Unit 5 was inoperable for seven months, while Costa Sur Unit 6 was inoperable for even longer, not returning to service until 2021. The result was the loss of approximately 1000 megawatts ("MW") of generation capacity, and PREPA faced system instability and critical reserve deficits (hundreds of MW even with full utilization of available peaker units).

The earthquakes demonstrated all too well the need for the MobilePac Units, as PREPA was required to effectively operate these units as baseload units in the aftermath of the earthquakes in order to meet demand and ensure adequate reserve to keep the lights on. Even with the MobilePac Units available, PREPA experienced a number of load shedding events—at least eight (8) such events.

These natural disasters struck in the midst of PREPA's efforts to modernize its aging fleet of power plants, and significantly reduced PREPA's options and flexibility in keeping the lights on in Puerto Rico. It is against this backdrop that PREPA urges EPA to view PREPA's installation and operation of the Palo Seco MobilePac Units. Indeed, PREPA continues to be vulnerable as it approaches the coming hurricane season, and thus respectfully requests EPA to evaluate and exercise any equitable authorities and discretion it may have in resolving this matter.

II. The Earthquakes Fundamentally Altered PREPA's Plans for the MobilePac Units

Prior to the January 7, 2020 earthquake, PREPA had only operated the MobilePac Units for commissioning and testing purposes, as allowed by the DNER emergency variance, so that the units would be available in the event of a hurricane. PREPA had not operated these units commercially and intended to disconnect these units at the end of the 90-day emergency variance period.

Before the 90 days expired, PREPA applied for a construction permit for the MobilePac Units. This construction permit application included the applicability analysis PREPA had conducted to determine if its installation and operation of the MobilePac Units as intended would trigger New Source Review ("NSR") / Prevention of Significant Deterioration ("PSD") permitting requirements. PREPA's analysis indicated that it would not exceed the relevant emissions thresholds. Consistent with this analysis, PREPA's construction permit application sought for DNER to impose annual emissions limits on the MobilePac Units to keep them below the NSR/PSD significance thresholds for each pollutant.

Although PREPA had intended to keep the MobilePac Units offline and disconnected until PREPA obtained the DNER construction permit and NOx water injection controls were operational, the unforeseen emergency caused by the earthquakes resulted in a serious generation shortfall of nearly 1000 MW, as described above. PREPA's projections showed critical reserve deficiencies and significant risk of load shedding. As noted above, this load shedding actually came to pass on a number of occasions.

In the aftermath of the earthquake disaster, as an island system, PREPA was required to take any action necessary to restore power to and keep the lights on in Puerto Rico in order to protect the public health and welfare. The situation required PREPA to bring the MobilePac Units into service and to operate the MobilePac Units in a manner and to a degree that had not been intended or anticipated by PREPA. Shortly after the earthquakes, in mid-January, PREPA alerted EPA and DNER of the dire situation and the need to operate all available generation units, and sought emergency relief in the form of a no-action assurance. PREPA's request for a no-action assurance included the MobilePac Units, which was not granted by EPA, although EPA was made well aware of the fact that PREPA would need to operate the MobilePac Units until Costa Sur Unit 5 returned to service. PREPA continued to provide updates regarding its operation of the MobilePac Units and answered a number of questions from EPA in this regard.

Due to the large generation shortfall created by the earthquakes, and as communicated to EPA on multiple occasions, PREPA needed to operate the MobilePac Units until the return to service of Costa Sur Unit 5 in mid-August 2020, despite the fact that DNER had not issued a construction permit and PREPA had not yet completed installation of NOx water injection controls. Accordingly, as a result of the earthquake emergency, PREPA did not meet several of the permit limits proposed in its construction permit application in the first year of operation of the MobilePac Units. Emissions from the MobilePac Units during the earthquake recovery period exceeded the PSD significance thresholds for particulate matter ("PM") and NOx, the latter due to the fact that PREPA had been forced to operate the units in response to the emergency before it had a chance to complete the planned NOx water injection controls.[1] PREPA had never intended to operate the units without NOx water injection controls, and the necessity to do so due to the earthquakes fundamentally changed the emissions profile of the units with respect to NOx. Once the water injection controls are operational, the units will be well within the NOx limit.

In future years, without the extreme circumstances caused by the earthquakes, PREPA would operate the units to meet the emission limits as proposed in its construction permit application. As detailed above, the need to utilize the MobilePac Units for 7 months following the earthquakes was not expected at the time of its permit application, and is directly attributable to meeting the island's power needs in the wake of the January 7, 2020 earthquakes.

Following the return to service of Costa Sur Unit 5 in mid-August 2020, PREPA removed the MobilePac Units from service.[2] Currently, the MobilePac Units have been disconnected and cannot be operated at this time. Barring an unforeseen emergency, these units will remain out-of-service until NOx water injection controls are fully operational, and DNER issues the required construction permit.

III. The Earthquakes Required PREPA to Operate Unit PSGT 3-1 in January 2020

PREPA's construction permit application to DNER stated that PREPA would take a permanent shutdown of three existing gas turbine units (PSGT 2-2, 3-1, and 3-2) in order to be able to apply emission credits attributable to the retirement of those units to the MobilePac Units. PREPA did not intend, and could not anticipate, that it would need to operate the MobilePac Units and Unit PSGT 3-1 to provide power to the grid at the same time, and intended for Unit PSGT 3-1 to cease operations prior to operation of the MobilePac Units to provide power to the grid.

Due to the earthquake emergency, PREPA was required to bring Unit PSGT 3-1 into service on January 7, 2020, and was unable to take it out of service until January 30, 2020, as it was needed to meet demand and assist in grid recovery after the earthquakes. As soon as the immediate acute emergency had passed, PREPA rendered Unit PSGT 3-1 inoperable. PREPA removed the starting motor and auxiliary equipment on or about February 2020, and Unit PSGT 3-1 has not been operated since that date.

In its construction permit application, PREPA committed to a permanent shutdown of Unit PSGT 3-1, provided that PREPA is able to utilize credits from its retirement of Unit PSGT 3-1 in its permitting of the MobilePac Units. PREPA's intention is to have DNER remove Units PSGT 2-2, 3-1, and 3-2 from the Palo Seco Title V permit, once the construction permit for the MobilePac Units is issued. PREPA remains committed to this approach. However, if Unit PSGT 3-1 cannot be used for

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[1] As detailed to EPA in other correspondence, PREPA initiated installation of the water injection controls during this timeframe, but encountered unforeseen technical difficulties. In April 2020, PREPA began the project to install a system of pumps and pipes for the injection of demineralized water ("demi water") from Palo Seco demi water tanks 1 to 4 to the three Palo Seco MobilePac Units. The project was completed in June 2020. However, at the end of June 2020, PREPA took water samples and discovered that the water quality results were out of tolerance with the OEM requirements for the Palo Seco MobilePac turbines.

[2] As detailed to EPA in prior communications, PREPA operated the MobilePac Units for a few hours in a few isolated instances for synchronization testing and to avoid load shedding in September and October 2020.

crediting purposes, PREPA cannot afford to lose the option to utilize this unit as a potential generation resource, given its current need for generation resources, and may decide to return Unit PSGT 3-1 to service. In other words, PREPA only plans to request that DNER permanently retire this unit if PREPA can use the associated netting credits towards the permitting of the MobilePac Units.

Apart from January 2020, due to the earthquake emergency, the MobilePac Units and Unit PSGT 3-1 were not operating at the same time to provide power to the grid. PREPA accordingly requests that EPA exercise any equitable authorities it may have to allow for PREPA to take credit for the permanent shutdown of Unit PSGT 3-1, as the need to operate this unit in January 2020 was beyond PREPA's control.

PREPA's approach recognizes the extremely challenging situations PREPA has faced in maintaining reliable power supply in the face of repeated natural disasters, while also serving the purpose of EPA's netting regulations. In its rulemaking establishing the netting requirements, EPA acknowledged it had flexibility in defining the scope of the contemporaneous period for netting purposes, and explained that a purpose of crediting emissions reductions during a 5-year contemporaneous period was because "EPA believes that the period should be wide enough so as to minimize any incentive for keeping old or obsolete equipment in operation beyond its usefulness. As a result, EPA has set five years, plus time for construction, as the period of contemporaneity for the purposes of the Part 52 PSD regulations . . . ." *Requirements for Preparation, Adoption, and Submittal of Implementation Plans; Approval and Promulgation of Implementation Plans*, 45 Fed. Reg. 52,676, 52,701 (Aug. 7, 1980); *see also* 40 C.F.R. § 52.21(b)(3).

The goal of the regulation would thus be served by allowing for PREPA to credit emissions reductions from the retirement of Unit PSGT 3-1, as this will ensure that Unit PSGT 3-1 is retired as a condition of the construction permit for the MobilePac Units. Palo Seco Unit PSGT 3-1 is an older unit (installed in February 1973), has no control equipment, is not subject to annual emissions limits (tons/year), has a fuel oil consumption limit that would effectively permit the unit to operate year-round, and is much less efficient than the Palo Seco MobilePac Units. Given its vintage, Unit PSGT 3-1 is also not subject to New Source Performance Standards for Stationary Combustion Turbines (40 C.F.R. Part 60, Subpart GG or Subpart KKKK). In contrast, the MobilePac Units will be subject to Subpart KKKK, and PREPA is proposing that the MobilePac Units will be subject to annual tons per year emissions limits as a part of the construction permit application submitted to DNER.

In addition, if not for the earthquakes, Unit PSGT 3-1 would no longer have been in operation when PREPA began commercial operation of the MobilePac Units to bring power to the grid, such that the decrease in emissions from Unit PSGT 3-1 would have occurred prior to the date that the increase in emissions occurred from when the MobilePac Units became operational to provide power to the grid. This is consistent with the intent of EPA's regulations defining the contemporaneous period. As explained in EPA's rulemaking, "[a]n increase from a physical change 'occurs' when the affected emissions unit becomes operational and begins to emit a particular pollutant. Any unit that requires shakedown becomes operational only after a reasonable shakedown period . . . ." *Requirements for Preparation, Adoption, and Submittal of Implementation Plans; Approval and Promulgation of Implementation Plans*, 45 Fed. Reg. 52,676, 52,698 (Aug. 7, 1980).

PREPA had also intended that it would not operate the MobilePac Units prior to the time it submitted its construction permit application to DNER. This construction permit application contained PREPA's commitment to retire Unit PSGT 3-1, as a condition of the construction permit for the MobilePac Units.

IV. Path Forward and Conclusion

Another hurricane season is rapidly approaching, and PREPA thus seeks EPA's guidance and assistance in reaching a fair resolution of the NOVOC for the MobilePac Units that reflects the significant challenges faces by PREPA and the equitable considerations outlined herein. Since the earthquakes struck in January 2020, PREPA has sought EPA's guidance on how best to proceed to ensure the Palo Seco MobilePac Units can be available for PREPA to utilize as a generation resource, particularly in emergencies. PREPA intends to work with DNER to expeditiously obtain the permit to construct for the MobilePac Units, and is working diligently to achieve operation of the water injection controls in accordance with the timeline conveyed to EPA. Likewise, PREPA intends to work with EPA to resolve uncertainty regarding the permitting path for the units, and to potentially enter into an administrative order, in the interim, that would allow for PREPA to operate the units during the hurricane season in the event of an emergency.

PREPA looks forward to continuing its discussions with EPA and to identifying a clear path forward that will allow PREPA to permit and operate the Palo Seco MobilePac Units as soon as possible.

If you have any questions, please do not hesitate to contact me. We look forward to providing any additional information the EPA may require.

Sincerely,

Adam Kushner
Partner
Hogan Lovells US LLP
555 Thirteenth Street, NW
Washington, DC 20004
Telephone: 202-637-5724
adam.kushner@hoganlovells.com

Cc:

Mr. Harish Patel, United States Environmental Protection Agency, Region 2

Mr. Alex Rivera, United States Environmental Protection Agency, Region 2, Caribbean Environmental Protection Division

Mr. Luis Sierra, Puerto Rico Department of Natural and Environmental Resources

From:	Prentice, Amanda
To:	Kushner, Adam M.
Cc:	Fink, Hayley
Subject:	RE: Administrative Compliance Order on Consent CAA 02-2022-1001 - EPA
Date:	Tuesday, November 9, 2021 1:06:31 PM

[EXTERNAL]
Thank you both very much.

Amanda M. Prentice
Assistant Regional Counsel
U.S. Environmental Protection Agency, Region 2
290 Broadway, 16th Floor
New York, NY 10007
Phone: 212-637-3209
Email: Prentice.Amanda@epa.gov
Pronouns: she/her

From: Kushner, Adam M. <adam.kushner@hoganlovells.com>
Sent: Tuesday, November 9, 2021 11:58 AM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: RE: Administrative Compliance Order on Consent CAA 02-2022-1001 - EPA

Amanda:

I will follow-up with the original signed version once I have that in hand.

Sincerely,

Adam

From: Kushner, Adam M.
Sent: Tuesday, November 9, 2021 11:52 AM
To: 'Prentice, Amanda' <Prentice.Amanda@epa.gov>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: Administrative Compliance Order on Consent CAA 02-2022-1001 - EPA

Amanda:

Enclosed find the Palo Seco MobilePacs ACO (CAA-02-2022-1001) signed by PREPA's executive director, Eng. Josue Colón.

We very much appreciate EPA willingness to work with the Puerto Rico Electric Power Authority as it seeks to get on line additional power.

Sincerely,

Adam

From:	Fink, Hayley
To:	Prentice, Amanda; Villatora, Liliana
Cc:	McHale, Mary; Patel, Harish; Fried, Gregory; Kushner, Adam M.; Fink, Hayley; velez.hector@epa.gov; Froikin.Sara@epa.gov; Schaaf.eric@Epa.gov; Luis R. Sierra-Torres; Steve.Keller@usdoj.gov
Subject:	RE: Follow-up from July 29, 2020 phone call with PREPA
Date:	Thursday, October 8, 2020 8:59:35 PM
Attachments:	PREPA Response to EPA Information Requests 10.08.20F with Appendices.pdf

Dear Ms. Villatora,

On behalf of the Puerto Rico Electric Power Authority, attached please find responses to the U.S. Environmental Protection Agency's requests for information.

I will be sending additional documents via Hogan Lovells' secure file transfer system due to file size, including the requested NOx testing reports and the Mercury and Air Toxics Standard reports for Aguirre.

Please let us know if you have any questions.

Best,

Hayley Fink

Hayley J. Fink
Senior Associate

Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004

Tel: +1 202 637 5600
Direct: +1 202 637 6435
Fax: +1 202 637 5910
Email: hayley.fink@hoganlovells.com
www.hoganlovells.com

From: Prentice, Amanda [mailto:Prentice.Amanda@epa.gov]
Sent: Thursday, August 06, 2020 3:30 PM
To: Kushner, Adam M.
Cc: Villatora, Liliana; McHale, Mary; Patel, Harish; Fried, Gregory; Fink, Hayley
Subject: Follow-up from July 29, 2020 phone call with PREPA

Dear Adam,

Liliana asked that I send out the following to you as a follow-up to our call last week with PREPA's representatives to discuss the consent decree ("CD") modification process, Mercury and Air Toxics Standards ("MATS") compliance, and the No Action Assurance ("NAA") letters. We received an email from Hayley on August 4, attaching some of the items requested during the call. We'd like to memorialize some of the items that were discussed on the call about which PREPA is planning to respond or supplement its response to EPA, as well as pose some additional questions concerning the Palo Seco Mobilepacs, and San Juan Units 5 and 6.

<u>Recap and Follow-Up Questions from July 29, 2020 Call:</u>

1. Please provide a summary (or a copy of the test report) of when PREPA performed the last two annual NOx tests to demonstrate that it is meeting the NOx baseline numbers at Palo Seco, Aguirre, and Costa Sur; explain why PREPA could not complete the tests where applicable; and provide a schedule for when the tests will be completed.
2. As we discussed, the 1999 Consent Decree requires written notification of stipulated penalties paid. We understand that on July 28, 2020, Hector Velez provided Maria Mercado with a list of names of individuals at EPA and their email addresses who should receive electronic notifications of the stipulated penalties paid by PREPA. Thank you for submitting copies of these notices from 2017 through the end of the first quarter of 2020 via secure file transfer.

3. Please provide the results of the two most recent particulate matter ("PM") stack tests conducted for Aguirre 1 and 2. Please specify the dates when the next PM stack testing will be conducted for each of these units.
4. Thank you for sending the MATS reports that were or should have been sent to CEDRI from the second half of 2017. Please upload these reports to CEDRI as well.
5. For the MATS-affected generating units, please provide a long-term schedule, with interim measures, of when PREPA expects these units will be in compliance with MATS. For non-MATS affected generating units, please confirm that these units will be in compliance with their permits and that a compliance order will not be required after the NAA has expired.
6. Please notify EPA when PREPA resumes use of liquefied natural gas ("LNG") at Costa Sur 5.
7. Please confirm that Costa Sur 5 is operating by August 14, 2020, as you anticipated, or provide the new expected start date.
8. As required by the NAA, and as you indicated you would do, please provide the requisite notice that Aguirre 2 came back into service as of May 6, 2020.
9. We are in the process of reviewing the information you submitted on August 4 concerning MATS emission data in response to the questions posed in Mary McHale's June 1, 2020 email. We will follow-up as needed if we have further questions.
10. As requested in the June 1, 2020 email message to you from Mary McHale, please provide the clarification on three items from the written Force Majeure notice submitted by PREPA on April 8, 2020.
11. Please clarify the extent to which the Title III process will provide PREPA with funding to comply with environmental laws, as you indicated, or explain any hurdles you expect as a result of the Title III process in obtaining funding for environmental compliance.

Palo Seco Mobilepac Additional Questions

12. For each of the Palo Seco Mobilepac units, please provide the actual hours of operation, the actual fuel usage, and fuel type for the complete months of May, June, and July 2020.
13. Please provide a written description of the issues that PREPA is having with the demineralized water and the holding tank, and how this is affecting the water injection system. Please provide a schedule with interim milestones for when these issues will be addressed, and the water injection will be operational. Also, please provide the date when the construction of the water piping delivery system to the Mobilepac units was completed. If it has not been completed, please explain the cause of the delay and the expected date of completion.

San Juan Units 5 and 6 Additional Questions

14. You indicated that San Juan Units 5 and 6 were modified to allow dual-fuel capacity on April 6, 2020 (Unit 5) and April 14, 2020 (Unit 6), and your August 4 email provided copies of the notifications to DNER. Please provide the date(s) on which construction commenced on the burner conversion for Units 5 and 6.
15. Please provide the actual fuel type and amount of fuel burned on a monthly basis for Units 5 and 6 since the burner conversions were completed on each unit.
16. You indicated that PREPA expects to install the SCR/OxCat controls on Unit 5 by October 2020. Please continue to provide EPA Region 2 with updates regarding this schedule, particularly if it is delayed.
17. The October 3, 2019 DNER permit for Units 5 and 6 requires PREPA to install the SCR/OxCat no later than six months from the date natural gas burning begins. Does PREPA expect to meet this requirement? If not, please explain.
18. Due to the current operational requirements for San Juan Units 5 and 6 caused by the ongoing power emergency in Puerto Rico, does PREPA expect to meet for the upcoming 365-day rolling periods the various 365-day rolling PSD non-applicability emission limits incorporated into its DNER permit as a result of the addition of the natural gas capability?

Please explain.

19. Please provide the approximate date that PREPA expects to exceed the 15,000 hr/365-day limit on the combined Units 5 and 6 that is currently in the PSD permit.

Thank you for your help in answering these questions. We look forward to hearing from you.

Amanda M. Prentice
Assistant Regional Counsel
U.S. Environmental Protection Agency, Region 2
290 Broadway, 16th Floor
New York, NY 10007
Phone: 212-637-3209
Email: Prentice.Amanda@epa.gov
Pronouns: she/her

From:	Kushner, Adam M.
To:	Prentice, Amanda
Cc:	Fink, Hayley; Villatora, Liliana; McHale, Mary
Subject:	RE: IMPORTANT -- PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol
Date:	Wednesday, May 4, 2022 5:35:01 PM
Attachments:	image001.jpg

Thank you.

From: Prentice, Amanda <Prentice.Amanda@epa.gov>
Sent: Wednesday, May 4, 2022 5:34 PM
To: Kushner, Adam M. <adam.kushner@hoganlovells.com>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>; Villatora, Liliana <Villatora.Liliana@epa.gov>; McHale, Mary <McHale.Mary@epa.gov>
Subject: RE: IMPORTANT -- PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

[EXTERNAL]
Hi Adam,

Thanks for your note. I've raised your concerns with our team and we will hopefully be getting back to you soon. I am copying Mary and Liliana since I will be out of the office tomorrow and Friday on vacation. I'll be back in the office on Monday.

Take care,
Amanda

Amanda M. Prentice
Assistant Regional Counsel
U.S. Environmental Protection Agency, Region 2
290 Broadway, 16th Floor
New York, NY 10007
Phone: 212-637-3209
Email: Prentice.Amanda@epa.gov
Pronouns: she/her

From: Kushner, Adam M. <adam.kushner@hoganlovells.com>
Sent: Wednesday, May 4, 2022 9:30 AM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>

Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: IMPORTANT -- PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Amanda:

I am sharing with you an email chain related to PREPA's attempt to emissions test the MobilePac units.

Simply stated, the level of frustration is quite here as EPA is insisting on actual emissions data (rather than modeling data from the manufacturer) on units we are not authorized to run and test.

The hurricane season is fast approaching (begins June 1) and as you know it take several weeks to get our contractors in the field for testing.

I fear that we are through the looking glass with respect to the below, and we need to resolve this as soon as possible.

I am standing by ready to speak about this.

Sincerely,

Adam

From: Rao, Supriya <Rao.Supriya@epa.gov>
Sent: Thursday, April 28, 2022 2:25 PM
To: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Cc: rivera.alex@epa.gov <rivera.alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph <Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>; Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <Steven.Babcock2@tetratech.com>; Tang, Kai <Tang.Kai@epa.gov>; Lynes, Carol <Lynes.Carol@epa.gov>; AmarilysRosario@jca.pr.gov <AmarilysRosario@jca.pr.gov>; Rao, Supriya <Rao.Supriya@epa.gov>
Subject: RE: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Good afternoon, José.

We have reviewed Palo Seco's response which is emissions estimates based on modeling calculations and a presumed ½" water column difference in backpressure. The emissions estimates are not actual test/emissions data. The emissions estimates response is not adequate to substantiate that the turbine emissions from the operation is the same in both cases, that is (1) operation of turbine with the silencer baffles/box and the stack extensions and (2) operation of turbine without the silencer baffles/box but with the stack extensions.

Palo Seco has not provided a rationale for substituting the stack extensions in place of the silencer baffles/box during compliance demonstration testing. The proposed removal of the silencer baffles/box during testing is not approvable because it is not representative of normal operations as required during testing per NSPS Subpart A and NESHAP Subpart A provisions. The stack extensions need to be downstream of the silencer baffles/box to meet EPA Method 1 requirements.

Thanks,

Supriya Rao, P.E., C.M.
Air and Water Quality Assurance Team
USEPA Region 2, LSASD-MAB
Office Phone: 732-321-4461
Cell Phone: 332-205-2673
Email: Rao.Supriya@epa.gov

From: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Sent: Wednesday, April 27, 2022 10:17 AM
To: Rao, Supriya <Rao.Supriya@epa.gov>
Cc: Rivera, Alex <Rivera.Alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph <Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>; Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <Steven.Babcock2@tetratech.com>; Tang, Kai <Tang.Kai@epa.gov>; Lynes, Carol <Lynes.Carol@epa.gov>; AmarilysRosario@jca.pr.gov
Subject: Re: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Thanks for your confirmation Supriya. Looking forward for approval.

José A. Santos Jiménez

Manager / Technical Advisor

Puerto Rico Electric Power Authority

Environmental Protection & Quality Assurance Division

jose.santos@prepa.com

787-521-4961

****

From: Rao, Supriya <Rao.Supriya@epa.gov>
Sent: Wednesday, April 27, 2022 9:40 AM
To: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Cc: rivera.alex@epa.gov <rivera.alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph <Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>; Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <Steven.Babcock2@tetratech.com>; Tang, Kai <Tang.Kai@epa.gov>; Lynes, Carol <Lynes.Carol@epa.gov>; AmarilysRosario@jca.pr.gov <AmarilysRosario@jca.pr.gov>; Rao, Supriya <Rao.Supriya@epa.gov>
Subject: RE: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Good morning, José.

Just confirming the receipt of your email/response, it's being internally reviewed and is being prioritized.

Thanks,
Supriya Rao, P.E., C.M.
Air and Water Quality Assurance Team
USEPA Region 2, LSASD-MAB
Office Phone: 732-321-4461
Cell Phone: 332-205-2673
Email: Rao.Supriya@epa.gov

From: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Sent: Thursday, April 21, 2022 5:59 PM
To: Rao, Supriya <Rao.Supriya@epa.gov>
Cc: Rivera, Alex <Rivera.Alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph <Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>; Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <Steven.Babcock2@tetratech.com>; Tang, Kai <Tang.Kai@epa.gov>; Lynes, Carol <Lynes.Carol@epa.gov>; AmarilysRosario@jca.pr.gov
Subject: Re: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Good afternoon Supriya, thanks for the response.

As we mentioned in PREPA's earlier communication, the exhaust silencer has no impact on emissions. The silencer reduces noise from the units but does not have an impact on gaseous or particulate pollutant emissions. The stack extensions will allow for accurate measurement of emissions and will be reflective of emissions from the combustion turbine, with or without, the silencer. Furthermore, it has been noted that exhaust backpressure on the turbine will be slightly lower without the silencer baffles. MP Aero has modelled the expected performance impact based on an estimated ½" water column decrease in backpressure, and their model shows no change in emissions concentrations and a negligible increase in exhaust flow rate.

Per your request in April 12, 2022 email communication: "...Otherwise, please provide emissions data documentation to substantiate that the turbine emissions from the operation is the same in both cases, that is (1) operation of turbine with the silencer baffles/box and the stack extensions and (2) operation of turbine without the silencer baffles/box but with the stack extensions." I'm including the emissions data estimates (FT8-MP_60Hz_Palo Seco with and without baffles 04-20-2022.pdf), as provided by the unit manufacturer, which represent unit behavior with or without the silencer baffles. These are representative for the unit and consistent with the test approach presented on the Protocol.

We appreciate all of EPA's efforts, as well as any urgency that may be directed towards the test protocol's final approval. We look forward to testing the units as soon as possible.

Best regards;

José A. Santos Jiménez

Manager / Technical Advisor

Puerto Rico Electric Power Authority

Environmental Protection & Quality Assurance Division

jose.santos@prepa.com

787-521-4961

From: Rao, Supriya <Rao.Supriya@epa.gov>
Sent: Tuesday, April 12, 2022 12:50 PM

To: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Cc: rivera.alex@epa.gov <rivera.alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph <Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>; Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <Steven.Babcock2@tetratech.com>; Tang, Kai <Tang.Kai@epa.gov>; Lynes, Carol <Lynes.Carol@epa.gov>; AmarilysRosario@jca.pr.gov <AmarilysRosario@jca.pr.gov>; Rao, Supriya <Rao.Supriya@epa.gov>
Subject: RE: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Good afternoon, José.

We have completed our review of the revised protocol received on April 7, 2021, most of the changes done look good. We have one comment as listed below. Please provide the below information.

- The proposed removal of the silencer box/baffles during testing is not representative of normal operations as required during testing per NSPS Subpart A and NESHAP Subpart A provisions. The facility needs to consider installing stack extensions on top of the silencer box/baffles to meet EPA Method 1 requirements. Otherwise, please provide emissions data documentation to substantiate that the turbine emissions from the operation is the same in both cases, that is (1) operation of turbine with the silencer baffles/box and the stack extensions and (2) operation of turbine without the silencer baffles/box but with the stack extensions.

If you have any questions or would like to discuss this, please feel free to reach out to us and we can set up a conference call.

Thanks,
Supriya Rao, P.E., C.M.
Air and Water Quality Assurance Team
USEPA Region 2, LSASD-MAB
Office Phone: 732-321-4461
Cell Phone: 332-205-2673
Email: Rao.Supriya@epa.gov

From: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Sent: Saturday, April 9, 2022 12:34 PM
To: Rao, Supriya <Rao.Supriya@epa.gov>
Cc: Rivera, Alex <Rivera.Alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph

<Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>; Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <Steven.Babcock2@tetratech.com>; Tang, Kai <Tang.Kai@epa.gov>; Lynes, Carol <Lynes.Carol@epa.gov>; AmarilysRosario@jca.pr.gov
Subject: Re: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Hi Supriya. Thanks for the fast response.

The exhaust silencer has no impact on emissions. The silencer reduces noise from the units but does not have an impact on gaseous or particulate pollutant emissions. The stack extensions will allow for accurate measurement of emissions and will be reflective of emissions from the combustion turbine, with or without, the silencer.

Please let us know if additional clarifications are needed.

Regards;

José A. Santos Jiménez

Manager / Technical Advisor

Puerto Rico Electric Power Authority

Environmental Protection & Quality Assurance Division

jose.santos@prepa.com

787-521-4961

From: Rao, Supriya <Rao.Supriya@epa.gov>
Sent: Thursday, April 7, 2022 3:06 PM
To: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Cc: rivera.alex@epa.gov <rivera.alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph <Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>; Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <steven.babcock2@tetratech.com>; Tang, Kai <Tang.Kai@epa.gov>; Lynes, Carol <Lynes.Carol@epa.gov>; AmarilysRosario@jca.pr.gov <AmarilysRosario@jca.pr.gov>; Rao, Supriya <Rao.Supriya@epa.gov>
Subject: RE: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Good afternoon, José.

We have reviewed the revised protocol and would like to request the below information/clarification.

- The protocol indicates removing silencer baffles/box and stack extensions will be installed on the existing exhaust transition piece rather than installing stack extensions on the existing silencer baffles/box. Please clarify how the removal of the silencer baffles/box will impact the exhaust parameters and emission characteristics. How would the emissions test results be representative of operations while using silencer box/baffles during normal operation.

Thanks,
Supriya Rao, P.E., C.M.
Air and Water Quality Assurance Team
USEPA Region 2, LSASD-MAB
Office Phone: 732-321-4461
Cell Phone: 332-205-2673
Email: Rao.Supriya@epa.gov

From: Rao, Supriya <Rao.Supriya@epa.gov>

Sent: Thursday, April 7, 2022 11:13 AM
To: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Cc: Rivera, Alex <Rivera.Alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph <Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>; Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <steven.babcock2@tetratech.com>; Tang, Kai <Tang.Kai@epa.gov>; Lynes, Carol <Lynes.Carol@epa.gov>; AmarilysRosario@jca.pr.gov; Rao, Supriya <Rao.Supriya@epa.gov>
Subject: RE: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Good morning, José.

Thank you for sending the revised protocol and summary of the changes, we will initiate our review and reach out to you.

Thanks,
Supriya Rao, P.E., C.M.
Air and Water Quality Assurance Team
USEPA Region 2, LSASD-MAB
Office Phone: 732-321-4461
Cell Phone: 332-205-2673
Email: Rao.Supriya@epa.gov

From: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Sent: Thursday, April 7, 2022 10:33 AM
To: Rao, Supriya <Rao.Supriya@epa.gov>
Cc: Rivera, Alex <Rivera.Alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph <Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>; Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <steven.babcock2@tetratech.com>; Tang, Kai <Tang.Kai@epa.gov>; Lynes, Carol <Lynes.Carol@epa.gov>; AmarilysRosario@jca.pr.gov
Subject: Re: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Good morning, Supriya.

The Puerto Rico Electric Power Authority hereby submits to the United States Environmental Protection Agency the revised Emissions Test Protocol (Rev. 6) for testing three simple cycle combustion turbines at the Palo Seco Power Plant. I highlighted the updates for ease of evaluation.

The document reflects and address the concerns presented on EPA's February 18, 2022, letter regarding the protocol. Additionally considers recommendations as discussed on the January 26, 2022, conference call with EPA, PREPA and its contractors. Specifically covers the situation on (1) Sample locations for EPA's Method 1 (utilizing temporary stack extensions), (2) Measurements of PM10 and PM2.5 implementing EPA Methods 201 A & 202, and (3) Use of recommended sampling loacations to measure flow rates consistent with methods requirements (e.g. 6 in dia. test ports).

We appreciate all efforts on the evaluation of the Protocol. PREPA is available for discussions and to facilitate clarifications as needed.

Do not hesitate to contact me should you need to discuss.

Best Regards;

José A. Santos Jiménez

Manager / Technical Advisor

Puerto Rico Electric Power Authority

Environmental Protection & Quality Assurance Division

jose.santos@prepa.com

787-521-4961

From: Rao, Supriya <Rao.Supriya@epa.gov>
Sent: Friday, February 18, 2022 3:01 PM
To: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Cc: rivera.alex@epa.gov <rivera.alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph <Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>; Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <steven.babcock2@tetratech.com>; Tang, Kai <Tang.Kai@epa.gov>; Lynes, Carol <Lynes.Carol@epa.gov>; Rao, Supriya <Rao.Supriya@epa.gov>
Subject: RE: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Hi José,

Good afternoon.

The USEPA has reviewed the files received via email on February 8, 2022, and please find attached the response letter.

If you have any questions or would like to discuss the attached letter, please feel free to reach out to us and we can set up a conference call. Please confirm the receipt of the email/attachment.

Thank you,
Supriya Rao, P.E., C.M.
Air and Water Quality Assurance Team
USEPA Region 2, LSASD-MAB
Office Phone: 732-321-4461
Cell Phone: 332-205-2673
Email: Rao.Supriya@epa.gov

From: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Sent: Wednesday, February 9, 2022 11:02 AM
To: Rao, Supriya <Rao.Supriya@epa.gov>
Cc: Rivera, Alex <Rivera.Alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph <Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>; Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <steven.babcock2@tetratech.com>; Tang, Kai <Tang.Kai@epa.gov>; Lynes, Carol <Lynes.Carol@epa.gov>
Subject: Re: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Thanks

On Feb 9, 2022, at 9:44 AM, Rao, Supriya <Rao.Supriya@epa.gov> wrote:

[CAUTION] This email originated from outside the organization. Do not open suspicious links or attachments. Report concerns to Cybersecurity@lumapr.com
[PRECAUCIÓN] Este correo electrónico se originó fuera de la organización. No abra enlaces o archivos adjuntos sospechosos. Informe a Cybersecurity@lumapr.com

Thank you Jose, confirming receipt of the email.

We will start the review of the files and reach out to you with any questions.

Thanks,
Supriya Rao, P.E., C.M.
Air and Water Quality Assurance Team
USEPA Region 2, LSASD-MAB
Office Phone: 732-321-4461
Cell Phone: 332-205-2673
Email: Rao.Supriya@epa.gov

From: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Sent: Tuesday, February 8, 2022 6:38 PM
To: Rao, Supriya <Rao.Supriya@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Lonergan, Ralph <Lonergan.Ralph@epa.gov>; Jon, Frank <Jon.Frank@epa.gov>
Cc: Indira Mohip Colón <INDIRA.MOHIP@prepa.com>; Steven Babcock <steven.babcock2@tetratech.com>
Subject: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Hello all.

For your review and approval.

Per discussions in our January 26, 2022, Teams meeting, enclosed find supplemental information to further describe approach under the alternative site selection procedure to measure particulate as outlined in EPA Method 1.

Additionally enclosed find the Emissions Test Protocol - Rev. 3. It includes highlighted sections to reflect broader explanation and support for Method 1, CTM-013 and Unit figures as requested in our meetings and communications.

Please share with your appropriate colleagues and do not hesitate to contact me should you need additional information. We are available to discuss during this week.

Regards;

José A. Santos Jiménez

Manager / Technical Advisor

Puerto Rico Electric Power Authority

Environmental Protection & Quality Assurance Division

jose.santos@prepa.com

787-521-4961

<image001.jpg>
****

borrar el material de su computadora.

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If you would like to know more about how we are managing the impact of the COVID-19 pandemic on our firm then take a look at our brief Q&A. If you would like to know more about how to handle the COVID-19 issues facing your business then take a look at our information hub.

About Hogan Lovells
Hogan Lovells is an international legal practice that includes Hogan Lovells US LLP and Hogan Lovells International LLP. For more information, see www.hoganlovells.com.

From:	Fink, Hayley
To:	Prentice, Amanda; Kushner, Adam M.; Villatora, Liliana
Cc:	Fink, Hayley
Subject:	RE: MobilePacs
Date:	Wednesday, July 28, 2021 5:41:12 PM

Hi Amanda,

Yes, according to the Gantt charts, the projects will be completed in advance of that date.

Commissioning is currently scheduled to commence in mid-August.

Best,

Hayley

Hayley J. Fink
Senior Associate

Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004

Tel: +1 202 637 5600
Direct: +1 202 637 6435
Fax: +1 202 637 5910
Email: hayley.fink@hoganlovells.com
www.hoganlovells.com

From: Prentice, Amanda <Prentice.Amanda@epa.gov>
Sent: Wednesday, July 28, 2021 5:34 PM
To: Fink, Hayley <hayley.fink@hoganlovells.com>; Kushner, Adam M. <adam.kushner@hoganlovells.com>; Villatora, Liliana <Villatora.Liliana@epa.gov>
Subject: RE: MobilePacs

[EXTERNAL]
Thanks, Hayley. Are the projects still on target to be completed by August 31, 2021?

Amanda M. Prentice
Assistant Regional Counsel
U.S. Environmental Protection Agency, Region 2
290 Broadway, 16th Floor
New York, NY 10007
Phone: 212-637-3209
Email: Prentice.Amanda@epa.gov
Pronouns: she/her

CONFIDENTIAL: This transmission may contain deliberative and/or enforcement confidential, attorney-client, or otherwise privileged material. Do not release under FOIA without appropriate review. If you have received this message in error, you are asked to notify the sender and to delete this message.

From: Fink, Hayley <hayley.fink@hoganlovells.com>
Sent: Wednesday, July 28, 2021 5:27 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>; Kushner, Adam M. <adam.kushner@hoganlovells.com>; Villatora, Liliana <Villatora.Liliana@epa.gov>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: RE: MobilePacs

Hi Amanda and Liliana,

We look forward to receiving the draft order.

In the meantime, please find attached the current status report and timeline for the demineralized water project for the water injection controls.

Please let us know if you have any questions.

Best,

Hayley

Hayley J. Fink
Senior Associate

Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004

Tel: +1 202 637 5600
Direct: +1 202 637 6435
Fax: +1 202 637 5910
Email: hayley.fink@hoganlovells.com
www.hoganlovells.com

From: Prentice, Amanda <Prentice.Amanda@epa.gov>
Sent: Tuesday, July 27, 2021 9:41 AM
To: Kushner, Adam M. <adam.kushner@hoganlovells.com>; Villatora, Liliana <Villatora.Liliana@epa.gov>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: RE: MobilePacs

[EXTERNAL]
Hi Adam,

We'll try to get you the draft by the end of this week.

Thanks,
Amanda

Amanda M. Prentice
Assistant Regional Counsel
U.S. Environmental Protection Agency, Region 2
290 Broadway, 16th Floor
New York, NY 10007
Phone: 212-637-3209
Email: Prentice.Amanda@epa.gov
Pronouns: she/her

From: Kushner, Adam M. <adam.kushner@hoganlovells.com>
Sent: Monday, July 26, 2021 4:34 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>; Villatora, Liliana <Villatora.Liliana@epa.gov>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: RE: MobilePacs

Thanks Amanda, but can you be more specific?

From: Prentice, Amanda <Prentice.Amanda@epa.gov>
Sent: Monday, July 26, 2021 4:33 PM
To: Kushner, Adam M. <adam.kushner@hoganlovells.com>; Villatora, Liliana <Villatora.Liliana@epa.gov>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: RE: MobilePacs

[EXTERNAL]
Hi Adam,

Thanks for your message. We hope to have the draft order over to you soon.

Thanks,

Amanda

Amanda M. Prentice
Assistant Regional Counsel
U.S. Environmental Protection Agency, Region 2
290 Broadway, 16th Floor
New York, NY 10007
Phone: 212-637-3209
Email: Prentice.Amanda@epa.gov
Pronouns: she/her

From: Kushner, Adam M. <adam.kushner@hoganlovells.com>
Sent: Monday, July 26, 2021 3:25 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>; Villatora, Liliana <Villatora.Liliana@epa.gov>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: RE: MobilePacs

Amanda, Liliana:

Following up on the message from Friday.

Can you please let us know the status?

Thanks,

Adam

From: Kushner, Adam M.
Sent: Friday, July 23, 2021 11:33 AM
To: 'Prentice, Amanda' <Prentice.Amanda@epa.gov>; Villatora, Liliana <Villatora.Liliana@epa.gov>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: MobilePacs

Amanda, Liliana;

Can you provide PREPA with a status of the draft administrative order for the MobilePacs?

The MobilePacs are on schedule to be available for commissioning on mid-August and we would very much like to have an administrative order in hand so that we can complete their commissioning and have them available.

Sincerely,

Adam

Adam Kushner
Partner

Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004

Tel: +1 202 637 5600
Direct: +1 202 637 5724
Fax: +1 202 637 5910
Email: adam.kushner@hoganlovells.com
www.hoganlovells.com

Please consider the environment before printing this e-mail.

From:	Fink, Hayley
To:	Prentice, Amanda; Kushner, Adam M.; Villatora, Liliana
Cc:	Fink, Hayley
Subject:	RE: MobilePacs
Date:	Wednesday, July 28, 2021 5:41:12 PM

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Commissioning is currently scheduled to commence in mid-August.

Best,

Hayley

Hayley J. Fink
Senior Associate

Hogan Lovells US LLP
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From: Prentice, Amanda <Prentice.Amanda@epa.gov>
Sent: Wednesday, July 28, 2021 5:34 PM
To: Fink, Hayley <hayley.fink@hoganlovells.com>; Kushner, Adam M. <adam.kushner@hoganlovells.com>; Villatora, Liliana <Villatora.Liliana@epa.gov>
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Hayley

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Subject: RE: MobilePacs

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Subject: RE: MobilePacs

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Can you please let us know the status?

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Adam

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Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: MobilePacs

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Sincerely,

Adam

Adam Kushner
Partner

Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004

Tel: +1 202 637 5600
Direct: +1 202 637 5724
Fax: +1 202 637 5910
Email: adam.kushner@hoganlovells.com
www.hoganlovells.com

Please consider the environment before printing this e-mail.

From:	Prentice, Amanda
To:	Kushner, Adam M.
Cc:	Fink, Hayley; Villatora, Liliana; Rivera, Alex
Subject:	RE: PREPA MobilePac - Water Injection -- Schedule
Date:	Monday, April 12, 2021 4:00:26 PM

[EXTERNAL]

Thanks, Adam. As we agreed at the end of the call this morning, by the end of this week, PREPA will also provide EPA with:

1. Further details regarding the timeline for LNG storage and the regasification facility to power the MobilePacs, including expected approvals required. If PREPA cannot provide the LNG timeline by Friday, please provide a date by which PREPA expects to provide a timeline to us;
2. PREPA's explanation, if any, as to how it can include the retirement of PSGT Unit 3-1 as part of its PSD netting analysis, including a discussion of potential flexibilities and equities for EPA's consideration.

Once we have that information in hand, we will suggest dates for a follow-up meeting.

Finally, as we discussed, we request to be included in all written or verbal communications with DNER regarding the MobilePacs and the NOV, and communications that may impact the resolution of the NOV. If you are aware of email communications in the last few months with DNER on these matters where we were not included, we request that you provide them to us.

Thanks,

Amanda

From: Kushner, Adam M. <adam.kushner@hoganlovells.com>
Sent: Monday, April 12, 2021 3:36 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: PREPA MobilePac - Water Injection -- Schedule

Amanda:

Please see below for the projected timeline for the components of the demineralized water project for the NOx injection system:

Timeline for RFP 3068 - New Demineralized Water Stainless Steel Piping and Fittings

- Bid process opened: April 5, 2021
- Technical evaluation and award: Proposal evaluation completed and recommendation sent to the Permanent Bids Evaluation Committee on April 7, 2021
- Proposal selection/Award: Expected on or about April 21, 2021
- Contract: Expected on or about May 2, 2021
- Mobilization and project commencement: Expected on or about May 9, 2021
- Project completion: Expected mid-September 2021

Timeline RFP 3081 - New Demineralized Water Tank 4 for Palo Seco Steam Plant

- Proponent Q & A: Completed on April 5, 2021
- Bid process opening: April 12, 2021
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- Contract: Expected on or about May 15, 2021
- Mobilization and project commencement: Expected on or about May 21, 2021
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Please let us know if you have additional questions.
Sincerely,
Adam

If you would like to know more about how we are managing the impact of the COVID-19 pandemic on our firm then take a look at our brief Q&A. If you would like to know more about how to handle the COVID-19 issues facing your business then take a look at our information hub.

About Hogan Lovells
Hogan Lovells is an international legal practice that includes Hogan Lovells US LLP and Hogan Lovells International LLP. For more information, see www.hoganlovells.com.

From:	Kushner, Adam M.
To:	Prentice, Amanda
Cc:	Fink, Hayley; Villatora, Liliana; Rivera, Alex
Subject:	RE: PREPA MobilePac - Water Injection -- Schedule
Date:	Sunday, May 16, 2021 5:19:18 PM

Amanda:

Apologies for the delay in responding.

We should have a letter to EPA by the end of this week related to the Mobile Pac emergency authorization and application for a permit.

We do not currently have a timeline with respect to the availability of LNG and nor can we currently offer a time that we will have that information. That will likely have to wait until after the PREPA closing dates as outlined in our notice of transfer as required by the 1999 Consent Decree.

With respect to the water injection we offer the following:

- New Demineralized Water Stainless Steel Piping and Fittings: Mobilization and project commencement: May 4, 2021
- New Demineralized Water Tank 4 for Palo Seco Steam Plant: Mobilization and project commencement: May 6, 2021
- Projected completion: Expected August 31, 2021

Please let us know if you require additional information.

Sincerely,

Adam

From: Prentice, Amanda <Prentice.Amanda@epa.gov>
Sent: Wednesday, May 5, 2021 3:59 PM
To: Kushner, Adam M. <adam.kushner@hoganlovells.com>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>; Villatora, Liliana <Villatora.Liliana@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>
Subject: RE: PREPA MobilePac - Water Injection -- Schedule

[EXTERNAL]

Adam,

I am following up on my email to you dated April 12. Please respond by the end of this week with the requested information, or in the alternative, a timeline by which you expect to have the requested information. In addition, with respect to the water-injection projects, would you please let us know if the dates that I have highlighted in yellow below are still the operative dates for those action items? If not, would you please provide EPA with updated dates by the end of this week?

Thanks,

Amanda

Amanda M. Prentice
Assistant Regional Counsel
U.S. Environmental Protection Agency, Region 2
290 Broadway, 16th Floor
New York, NY 10007
Phone: 212-637-3209
Email: Prentice.Amanda@epa.gov
Pronouns: she/her

From: Prentice, Amanda
Sent: Monday, April 12, 2021 4:00 PM

To: Kushner, Adam M. <adam.kushner@hoganlovells.com>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>; Villatora, Liliana <Villatora.Liliana@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>
Subject: RE: PREPA MobilePac - Water Injection -- Schedule

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Thanks,
Amanda

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Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
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- Proponent Q & A: Completed on April 5, 2021
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Sincerely,

Adam

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From:	Villatora, Liliana
To:	Kushner, Adam M.; Prentice, Amanda
Cc:	Fink, Hayley
Subject:	RE: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol
Date:	Thursday, May 26, 2022 3:00:52 PM

[EXTERNAL]

Thank you, Adam. Have a great weekend!

From: Kushner, Adam M. <adam.kushner@hoganlovells.com>
Sent: Thursday, May 26, 2022 2:59 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>; Villatora, Liliana <Villatora.Liliana@epa.gov>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: FW: PREPA Palo Seco Test Protocol Combustion Turbines Supplemental Information and Updated Protocol

Amanda, Lilliana:

Enclosed find a copy of the Mitsubishi letter submitted to EPA earlier today.

Sincerely,

Adam

From: Villatora, Liliana
To: Kushner, Adam M.
Cc: Fink, Hayley; Gutierrez, Ana
Subject: RE: PREPA Response to EPA January 22, 2020 Request for Information
Date: Tuesday, April 7, 2020 6:44:02 PM

Adam,
Thank you for letting me know.
Liliana

From: Kushner, Adam M.
Sent: Tuesday, April 7, 2020 5:30 PM
To: Villatora, Liliana
Cc: Fink, Hayley ; Gutierrez, Ana
Subject: RE: PREPA Response to EPA January 22, 2020 Request for Information

Liliana:
In again reviewing our response, we have identified some issues with the reference to attachments and we will be sending a revised version of the response.
Please use the revised version of the response that we will send later today.
Apologies for any confusion.
Best,
Adam

From: Kushner, Adam M.
Sent: Tuesday, April 7, 2020 3:27 PM
To: 'Villatora, Liliana'
Cc: Fink, Hayley; Gutierrez, Ana
Subject: PREPA Response to EPA January 22, 2020 Request for Information
Dear Liliana:
Hope you're well.
Attached please find the Puerto Rico Electric Power Authority's response to the United States Environmental Protection Agency's January 22, 2020 request for information.
Please let us know if you have any questions.
Sincerely,
Adam

From:	Fink, Hayley
To:	Villatora.Liliana@epa.gov; Siegel.Joseph@epa.gov; LuisSierra@jca.pr.gov
Cc:	Kushner, Adam M.; Fink, Hayley
Subject:	RE: PSD Permitting Questions
Date:	Tuesday, June 16, 2020 9:01:50 PM
Attachments:	PREPA Response to U.S. EPA Questions Regarding Palo Seco Units 06.16.20F.pdf Palo Seco Baseline Actual Emissions By Unit 06.04.2020.xlsx

---

Dear Liliana and Joe:

On behalf of the Puerto Rico Electric Power Authority ("PREPA"), please see attached for PREPA's responses to the U.S. Environmental Protection Agency's ("EPA") questions regarding the Palo Seco MobilePac units. We are also providing PREPA's baseline emissions calculations in native Excel file format for EPA's reference.

In terms of EPA's questions regarding temporary generation, PREPA has decided that it will no longer be proceeding with the temporary generation RFP. We greatly appreciate the support and assistance EPA provided with this matter.

Please let us know if you have any questions.

Best,

Hayley Fink

Hayley J. Fink
Senior Associate

Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004

Tel: +1 202 637 5600
Direct: +1 202 637 6435
Fax: +1 202 637 5910
Email: hayley.fink@hoganlovells.com
www.hoganlovells.com

From: Kushner, Adam M.
Sent: Wednesday, May 27, 2020 11:59 AM
To: 'Siegel, Joseph'
Cc: Villatora, Liliana
Subject: RE: PSD Permitting Questions

Joe:

Thanks for your email.

Apologies for any mis-communication.

PREPA responded to the MobilePac-related questions during the April 28 telephone conference with EPA. We were anticipating a follow-up conversation with EPA.

Nonetheless, we are preparing a written response to EPA's questions, which we will provide soon.

Sincerely,

Adam

From: Siegel, Joseph [mailto:Siegel.Joseph@epa.gov]
Sent: Wednesday, May 20, 2020 6:25 PM
To: Kushner, Adam M.
Cc: Villatora, Liliana
Subject: PSD Permitting Questions

Hi Adam,

I hope that you are doing well. I'm checking in on PREPA's responses to the two attached sets of questions that Liliana sent you on April 24 in advance of our April 28 call with PREPA. Can you please let us know when we should expect the responses? We want to be sure that EPA has adequate time to review PREPA's plans since we know that PREPA already had timelines in mind for the projects and applicability reviews often require some back-and-forth between EPA and the facility owner/operator.

We look forward to hearing from you.

Thanks,

Joe

From:	Villatora, Liliana
To:	Fink, Hayley; Siegel, Joseph; Luis R. Sierra Torres
Cc:	Kushner, Adam M.
Subject:	RE: PSD Permitting Questions
Date:	Wednesday, June 17, 2020 7:24:15 AM

Hayley,

Thank you for the response.

Best regards,

Liliana

From: Fink, Hayley
Sent: Tuesday, June 16, 2020 9:02 PM
To: Villatora, Liliana ; Siegel, Joseph ; Luis R. Sierra Torres
Cc: Kushner, Adam M. ; Fink, Hayley
Subject: RE: PSD Permitting Questions

Dear Liliana and Joe:

On behalf of the Puerto Rico Electric Power Authority ("PREPA"), please see attached for PREPA's responses to the U.S. Environmental Protection Agency's ("EPA") questions regarding the Palo Seco MobilePac units. We are also providing PREPA's baseline emissions calculations in native Excel file format for EPA's reference.

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Hayley Fink

Hayley J. Fink

Senior Associate

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We look forward to hearing from you.

Thanks,
Joe

From:	Siegel, Joseph
To:	Fink, Hayley; Villatora, Liliana; Luis R. Sierra Torres
Cc:	Kushner, Adam M.
Subject:	RE: PSD Permitting Questions
Date:	Wednesday, June 17, 2020 11:15:50 AM

Dear Hayley,

Thank you for responding to our April 24 questions on Palo Seco. Your cover letter indicates that "PREPA initially responded to the below questions during its April 28, 2020 telephone conference with EPA. We reiterate those responses below." Just to clarify, the April 28, 2020 call between EPA and PREPA was on the new temporary generation MobilePacs that PREPA was, at that time, considering. We did not discuss EPA's questions on the three Moblile-Pacs and turbines at Palo Seco.

We will be in touch with follow-up questions after we have had an opportunity to conduct a thorough review of the information you provided.

Best regards,
Joe

From: Fink, Hayley <hayley.fink@hoganlovells.com>
Sent: Tuesday, June 16, 2020 9:02 PM
To: Villatora, Liliana <Villatora.Liliana@epa.gov>; Siegel, Joseph <Siegel.Joseph@epa.gov>; Luis R. Sierra Torres <LuisSierra@jca.pr.gov>
Cc: Kushner, Adam M. <adam.kushner@hoganlovells.com>; Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: RE: PSD Permitting Questions

Dear Liliana and Joe:

On behalf of the Puerto Rico Electric Power Authority ("PREPA"), please see attached for PREPA's responses to the U.S. Environmental Protection Agency's ("EPA") questions regarding the Palo Seco MobilePac units. We are also providing PREPA's baseline emissions calculations in native Excel file format for EPA's reference.

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Please let us know if you have any questions.

Best,

Hayley Fink

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We look forward to hearing from you.

Thanks,
Joe

From:	Fink, Hayley
To:	Prentice, Amanda
Cc:	Villatora, Liliana; Rivera, Alex; Patel.Harish@epa.gov; LuisSierra@jca.pr.gov; Kushner, Adam M.; Fink, Hayley
Subject:	RE: Puerto Rico Electric Power Authority MobilePac Units - Update on Status of Water Injection System
Date:	Monday, June 28, 2021 4:44:27 PM
Attachments:	Monthly Progress Report_June 2021 (002).pdf Progress Schedule_PREPA Demi Tank 4_Palo Seco_062721_rev1 (002).pdf

Dear Amanda:

On behalf of the Puerto Rico Electric Power Authority, attached please find the current schedule and progress report for the installation of the demi-water tank for the water injection system.

We look forward to setting up a follow-up meeting with you to discuss next steps.

Please do not hesitate to reach out to us with any questions.

Sincerely,

Hayley Fink

Hayley J. Fink
Senior Associate

Hogan Lovells US LLP
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Cc: Villatora, Liliana <Villatora.Liliana@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>; Patel.Harish@epa.gov; LuisSierra@jca.pr.gov; Fink, Hayley <hayley.fink@hoganlovells.com>; Kushner, Adam M. <adam.kushner@hoganlovells.com>
Subject: Puerto Rico Electric Power Authority MobilePac Units - Equitable Considerations

Dear Amanda:

On behalf of the Puerto Rico Electric Power Authority, attached please find a letter describing equitable considerations surrounding the Palo Seco MobilePac Units.

We look forward to setting up a follow-up meeting with you to discuss next steps.

Please do not hesitate to reach out to us with any questions.

Sincerely,

Hayley Fink

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Senior Associate

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Cc: Fink, Hayley <hayley.fink@hoganlovells.com>; Villatora, Liliana <Villatora.Liliana@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>
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To:	Prentice, Amanda
Cc:	Villatora, Liliana; Rivera, Alex; Patel.Harish@epa.gov; LuisSierra@jca.pr.gov; Kushner, Adam M.; Fink, Hayley
Subject:	RE: Puerto Rico Electric Power Authority MobilePac Units - Update on Status of Water Injection System
Date:	Tuesday, June 29, 2021 11:50:55 AM
Attachments:	Job Status Report 6-29-2021.pdf Schedule 6-29-2021.pdf

Dear Amanda:

Following up on our email from yesterday, attached please find additional information on the status and timeline for completion of the water injection system.

Attached are the current schedule and job status report for the new demineralized water stainless steel piping and fittings.

Please let us know if you have any questions.

Sincerely,

Hayley Fink

Hayley J. Fink
Senior Associate

Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
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From: Fink, Hayley <hayley.fink@hoganlovells.com>
Sent: Monday, June 28, 2021 4:44 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>
Cc: Villatora, Liliana <Villatora.Liliana@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>; Patel.Harish@epa.gov; LuisSierra@jca.pr.gov; Kushner, Adam M. <adam.kushner@hoganlovells.com>; Fink, Hayley <hayley.fink@hoganlovells.com>
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Hayley Fink

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To: Kushner, Adam M. <adam.kushner@hoganlovells.com>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>; Villatora, Liliana <Villatora.Liliana@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>
Subject: RE: PREPA MobilePac - Water Injection -- Schedule

[EXTERNAL]

Thanks, Adam. As we agreed at the end of the call this morning, by the end of this week, PREPA will also provide EPA with:

1. Further details regarding the timeline for LNG storage and the regasification facility to power the MobilePacs, including expected approvals required. If PREPA cannot provide the LNG timeline by Friday, please provide a date by which PREPA expects to provide a timeline to us;
2. PREPA's explanation, if any, as to how it can include the retirement of PSGT Unit 3-1 as part of its PSD netting analysis, including a discussion of potential flexibilities and equities for EPA's consideration.

Once we have that information in hand, we will suggest dates for a follow-up meeting.

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of the NOV. If you are aware of email communications in the last few months with DNER on these matters where we were not included, we request that you provide them to us.
Thanks,
Amanda

From: Kushner, Adam M. <adam.kushner@hoganlovells.com>
Sent: Monday, April 12, 2021 3:36 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>
Cc: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: PREPA MobilePac - Water Injection -- Schedule

Amanda:
Please see below for the projected timeline for the components of the demineralized water project for the NOx injection system:

Timeline for RFP 3068 - New Demineralized Water Stainless Steel Piping and Fittings

- Bid process opened: April 5, 2021
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- Proposal selection/Award: Expected on or about April 21, 2021
- Contract: Expected on or about May 2, 2021
- Mobilization and project commencement: Expected on or about May 9, 2021
- Project completion: Expected mid-September 2021

Timeline RFP 3081 - New Demineralized Water Tank 4 for Palo Seco Steam Plant

- Proponent Q & A: Completed on April 5, 2021
- Bid process opening: April 12, 2021
- Technical evaluation and award: Proposal evaluation completion expected on or before April 14, 2021
- Permanent Bids Evaluation Committee proposal selection/Award: Expected on or about April 28, 2021
- Contract: Expected on or about May 15, 2021
- Mobilization and project commencement: Expected on or about May 21, 2021
- Project completion: Expected by the end of September 2021

Please let us know if you have additional questions.
Sincerely,
Adam

From: Prentice, Amanda
To: Fink, Hayley
Subject: RE: Puerto Rico Electric Power Authority MobilePac Units - Update on Status of Water Injection System
Date: Wednesday, June 30, 2021 5:10:06 PM

[EXTERNAL]
Great, I'll call you then.

Take care,
Amanda

From: Fink, Hayley <hayley.fink@hoganlovells.com>
Sent: Wednesday, June 30, 2021 5:02 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>
Subject: RE: Puerto Rico Electric Power Authority MobilePac Units - Update on Status of Water Injection System

Hi Amanda,

Thanks for getting back to me so quickly. Tomorrow morning at 10am works great for me.

Best,

Hayley

From: Prentice, Amanda <Prentice.Amanda@epa.gov>
Sent: Wednesday, June 30, 2021 4:48 PM
To: Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: RE: Puerto Rico Electric Power Authority MobilePac Units - Update on Status of Water Injection System

[EXTERNAL]
Hi Hayley,

Thanks, I'm on another call, so I'm sorry I couldn't answer your call. I can either call you after I get off of the phone (I'm here today until 6), or I can call you tomorrow morning at 10?

Thanks,
Amanda

From: Fink, Hayley <hayley.fink@hoganlovells.com>
Sent: Wednesday, June 30, 2021 4:43 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>

Subject: RE: Puerto Rico Electric Power Authority MobilePac Units - Update on Status of Water Injection System

Hi Amanda,

I'm confirming your questions below with PREPA.

I also just called your number and left you a message, because I'm hoping to connect with you regarding next steps for the MobilePac units.

Do you have any time tomorrow for a brief (~10-15 minute) call? My schedule is flexible.

Thank you so much.

Best,

Hayley

From: Prentice, Amanda <Prentice.Amanda@epa.gov>
Sent: Wednesday, June 30, 2021 3:00 PM
To: Fink, Hayley <hayley.fink@hoganlovells.com>
Cc: Villatora, Liliana <Villatora.Liliana@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Luissierra@jca.pr.gov; Kushner, Adam M. <adam.kushner@hoganlovells.com>
Subject: RE: Puerto Rico Electric Power Authority MobilePac Units - Update on Status of Water Injection System

[EXTERNAL]
Thanks, Hayley. Would you kindly remind me how these two projects fit together – and I believe they are being worked on simultaneously, in tandem? Will delay(s) on one project affect the other project's timeline for completion?

Thanks,
Amanda

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Sent: Tuesday, June 29, 2021 11:51 AM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>
Cc: Villatora, Liliana <Villatora.Liliana@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Luissierra@jca.pr.gov; Kushner, Adam M. <adam.kushner@hoganlovells.com>; Fink, Hayley <hayley.fink@hoganlovells.com>

Subject: RE: Puerto Rico Electric Power Authority MobilePac Units - Update on Status of Water Injection System

Dear Amanda:

Following up on our email from yesterday, attached please find additional information on the status and timeline for completion of the water injection system.

Attached are the current schedule and job status report for the new demineralized water stainless steel piping and fittings.

Please let us know if you have any questions.

Sincerely,

Hayley Fink

Hayley J. Fink
Senior Associate
Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004
Tel: +1 202 637 5600
Direct: +1 202 637 6435
Fax: +1 202 637 5910
Email: hayley.fink@hoganlovells.com
www.hoganlovells.com
Please consider the environment before printing this e-mail.

From: Fink, Hayley <hayley.fink@hoganlovells.com>
Sent: Monday, June 28, 2021 4:44 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>
Cc: Villatora, Liliana <Villatora.Liliana@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>; Patel.Harish@epa.gov; LuisSierra@jca.pr.gov; Kushner, Adam M. <adam.kushner@hoganlovells.com>; Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: RE: Puerto Rico Electric Power Authority MobilePac Units - Update on Status of Water Injection System

Dear Amanda:

On behalf of the Puerto Rico Electric Power Authority, attached please find the current schedule and progress report for the installation of the demi-water tank for the water injection system.

We look forward to setting up a follow-up meeting with you to discuss next steps.

Please do not hesitate to reach out to us with any questions.

Sincerely,

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Email: hayley.fink@hoganlovells.com

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Sent: Wednesday, May 26, 2021 7:24 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>
Cc: Villatora, Liliana <Villatora.Liliana@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>; Patel.Harish@epa.gov; LuisSierra@jca.pr.gov; Fink, Hayley <hayley.fink@hoganlovells.com>; Kushner, Adam M. <adam.kushner@hoganlovells.com>
Subject: Puerto Rico Electric Power Authority MobilePac Units - Equitable Considerations

Dear Amanda:

On behalf of the Puerto Rico Electric Power Authority, attached please find a letter describing equitable considerations surrounding the Palo Seco MobilePac Units.

We look forward to setting up a follow-up meeting with you to discuss next steps.

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Subject: RE: PREPA MobilePac - Water Injection -- Schedule

[EXTERNAL]

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Please let us know if you have additional questions.

Sincerely,

Adam

If you would l ke to know more about how we are managing the impact of the COVID-19 pandemic on our firm then take a look at our brief Q&A. If you would like to know more about how to handle the COVID-19 issues facing your business then take a look at our information hub.

About Hogan Lovells
Hogan Lovells is an international legal practice that includes Hogan Lovells US LLP and Hogan Lovells International LLP. For more information, see www.hoganlovells.com.

From:	Prentice, Amanda
To:	Fink, Hayley
Cc:	Villatora, Liliana; Rivera, Alex; Patel, Harish; Luissierra@jca.pr.gov; Kushner, Adam M.
Subject:	RE: Puerto Rico Electric Power Authority MobilePac Units - Update on Status of Water Injection System
Date:	Thursday, July 1, 2021 6:10:44 PM

[EXTERNAL]

Thanks, Hayley.

From: Fink, Hayley <hayley.fink@hoganlovells.com>
Sent: Thursday, July 1, 2021 5:51 PM
To: Prentice, Amanda <Prentice.Amanda@epa.gov>
Cc: Villatora, Liliana <Villatora.Liliana@epa.gov>; Rivera, Alex <Rivera.Alex@epa.gov>; Patel, Harish <Patel.Harish@epa.gov>; Luissierra@jca.pr.gov; Kushner, Adam M. <adam.kushner@hoganlovells.com>; Fink, Hayley <hayley.fink@hoganlovells.com>
Subject: RE: Puerto Rico Electric Power Authority MobilePac Units - Update on Status of Water Injection System

Hi Amanda,

The two projects—the demineralized water tank and the stainless steel piping/fittings—are proceeding simultaneously in tandem, and are essentially independent projects, such that a delay in one of the projects should not delay the other. That said, both projects must be completed in order for the water injection system to be operational.

Please do not hesitate to let us know if you have additional questions.

Best,

Hayley

Hayley J. Fink

Senior Associate

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Subject: RE: PREPA MobilePac - Water Injection -- Schedule

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Please let us know if you have additional questions.

Sincerely,

Adam

GOBIERNO DE PUERTO RICO

DEPARTAMENTO DE RECURSOS NATURALES Y AMBIENTALES

24 OCT. 2019

ING. JOSÉ ORTIZ
Director Ejecutivo
Autoridad de Energía Eléctrica de Puerto Rico
Apartado 364267
San Juan, PR 00936-4267

Att: Efran Paredes Maisonet
Director Planificación y Protección Ambiental

Estimado ingeniero Ortiz,

Re: Solicitud de Dispensa de Emergencia
Autoridad de Energía Eléctrica de Puerto Rico.
Central Palo Seco
TV-4911-70-1196-0015

En carta con fecha del 11 de octubre de 2019 el Sr. Efran Paredes Maisonet, Director Planificación y Protección Ambiental de la Autoridad de Energía Eléctrica de Puerto Rico (en adelante AEE) presentó una solicitud de dispensa de emergencia para la instalación y operación de tres turbinas de gas con una capacidad de generación de aproximadamente 23 MW. La solicitud se presenta para asegurar la confiabilidad y resiliencia del sistema eléctrico. Esta solicitud se presenta conforme las disposiciones de la Regla 302 del Reglamento para el Control de la Contaminación Atmosférica (RCCA), Reglamento Núm. 5300, según enmendado. El inciso A de la Regla 302 del RCCA establece que:

A) La Junta podrá conceder dispensas de emergencia solo bajo circunstancias muy especiales, como por ejemplo, para evitar una amenaza inminente a la salud.

...

Según establece la AEE en su solicitud de dispensa, actualmente tiene varias unidades de carga base que están fuera de servicios debido a mantenimientos o reparaciones, o están limitadas a parte de su capacidad de generación de electricidad. Esta situación afecta la resiliencia del sistema eléctrico del país. Razón por la cual presentaron la solicitud de dispensa.

Conforme a lo anterior, se aprueba la solicitud de dispensa por un periodo que no podrá exceder de 90 días a partir de la fecha de esta notificación. Durante el periodo de dispensa deberá cumplir con todas las condiciones incluidas en el anejo. La información y condiciones sometidas en su solicitud de permiso forman parte de esta autorización.

24 OCT. 2019

De conformidad con la Sección 5.4 de la Ley Núm. 38-2017, conocida como, Ley de Procedimiento Administrativo Uniforme del Gobierno de Puerto Rico, se le apercibe que: "Toda persona a la que la agencia deniegue la concesión de una licencia, franquicia, permiso, endoso, autorización o gestión similar, tendrá derecho a impugnar la determinación de la agencia por medio de un procedimiento adjudicativo, según se establezca en la ley especial de que se trate y en el Capítulo III de dicha Ley." Para esto, se concede un término de veinte (20) días a partir de la notificación del mismo.

La agencia podrá revocar esta autorización en cualquier momento si se violan las condiciones del mismo o reglamentos y/o regulaciones aplicables. La agencia, además, podrá emitir una Orden de Cese y Desistimiento y Mostrar Causa.

Cualquier duda o pregunta, puede comunicarse con el Ing. Luis Sierra, Gerente Interino del Área de Calidad de Aire, al 787-767-8181, extensión 2300, o a través del correo electrónico luissierra@jca.pr.gov.

Cordialmente,

Tania Vázquez Rivera
Secretaria

TVR/lst

24 OCT. 2019

ANEJO: CONDICIONES DE DISPENSA

1. Por este medio se autoriza una dispensa por emergencia la instalación y operación de tres turbinas de gas en la Central Palo Seco, con una capacidad de generación de aproximadamente 23 MW cada una. Esta dispensa tendrá una duración que no excederá de 90 días a partir de la aprobación de la misma.
2. Deberá mantener copia de esta dispensa en la instalación en todo momento. La misma estará disponible para inspección por el personal técnico del Departamento de Recursos Naturales y Ambientales (en adelante DRNA) o la Agencia Federal de Protección Ambiental (EPA, en inglés).
3. Una vez culmine la dispensa, las unidades deberán ser desconectadas, a menos que un permiso para la construcción para las unidades, según las disposiciones de la Regla 203 del Reglamento 5300, según enmendado, haya sido emitido por esta agencia.
4. Esta dispensa no exime de acciones de cumplimiento y/o legales por la construcción/instalación de las unidades previo a la otorgación de esta dispensa de emergencia.
5. Para la operación de los generadores, el contenido máximo de azufre en el combustible No. 2 no excederá de 0.5 porciento por peso y en el gas natural no excederá de 5 gr/100 sft^3.
6. Deberá tener un registro de operación y consumo de combustible con contenido de azufre y horas de operación para cada turbina.
7. Deberá enviar un informe de aplicabilidad, y/o notificación inicial de ser necesario, con respecto a las disposiciones del 40 CFR, Parte 60, Subparte GG, Subparte KKKK o cualquier otra regulación que sea aplicable a las turbinas. Deberán indicar en el informe todos los requisitos aplicables a la unidad de emisión. De existir regulaciones que sean potencialmente aplicables, deberá indicar en el informe las razones por las cuales no le aplica.
8. Deberá cumplir con todos los requisitos aplicables en el informe enviado a la agencia. El no identificar adecuadamente la regulación aplicable, no les exime de incumplimiento con la regulación federal y/o estatal.
9. Estas unidades fueron clasificadas en su solicitud de dispensa como unidades estacionarias de emisión. Deberá llevar a cabo las pruebas de funcionamiento requeridas por la regulación federal para fuentes estacionarias, en los términos establecidos en el estándar de emisión aplicable.
10. Deberá someter un informe mensual indicando en una base diaria el contenido de azufre (porciento por peso) en los combustibles quemados o consumidos en la unidad durante cada mes. Este informe será enviado a la Junta a la atención de la Jefa de la División de Validación de Datos Modelaje Matemático del Área de Calidad de Aire, la Sra. Lula Lucia Fernández Fontán. Todos los informes mensuales deberán ser enviados en o antes de los treinta (30) días siguientes al final de cada mes natural.
11. La tonalidad de los gases emitidos durante la operación de cada motor incluido en este permiso no excederá del 20% de opacidad. Se permitirá una tonalidad de hasta 60% de opacidad sólo en un periodo no mayor de 4 minutos dentro de cualquier periodo de 30 minutos consecutivos.

TLM

Re: <<EXTERNAL EMAIL>>Palo Seco Turbines

José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Fri 2/19/2021 12:52 PM

To: Leimarys Delgado Medero <LeimarysDelgado@jca.pr.gov>; Luis R. Sierra-Torres <LuisSierra@jca.pr.gov>
Cc: Luisette X Ríos Castañer <LUISETTE.RIOS@prepa.com>; Amanda Rodriguez Martinez <AmandaRodriguez@jca.pr.gov>

2 attachments (2 MB)

LNG Supply to Mega Gens Palo Seco Steam Plant.pdf; ENM. 141-20-0340_02-10-2021.pdf;

Saludos Leimarys, Luis.

Adjunto suplemento de información complementando los datos ofrecidos el pasado 21 de junio de 2020 en relación a la petición de información del DRNA para la evaluación de la solicitud de permiso de construcción del Proyecto de Instalación de Turbinas en La Central Palo Seco. A continuación contestaciones al remanente de preguntas solicitadas.

1. Copia de la determinación final de EPA sobre la aplicabilidad o no aplicabilidad del proyecto de la Prevención de Deterioro Significativo (PSD, en inglés) para el proyecto solicitado. Según la carta de la EPA del 23 de julio de 2019, PREPA solicitó una revisión de no aplicabilidad expedita para tres unidades de generación. La EPA establece que PREPA accedió a proveer las razones de emisión por hora de las tres turbinas junto con los niveles de carga para que la EPA pudiera determinar si era posible establecer condiciones de no aplicabilidad para PSD para estas unidades. A la fecha de la comunicación EPA no había recibido dicha información. PREPA alego que el manufacturero de las unidades no había provisto los factores de emisión garantizados y EPA estableció que sin esta información no podrían comenzar la revisión expedita según solicitado.

- This project involves simple cycle combustion turbines envisioned to net out PSD, under NSR regulations it is not required to provide EPA with the netting analysis prior to construction. Description of the project as well as the applicability test used to determine that the project was not a major modification was included on the construction permit application.
- Although:
  - On November 26, 2019 PREPA provided EPA Region 2 personnel (via email) with copy of the DNER emergency waiver request (which includes units emission rates)
  - On April 7, 2020 PREPA Response to EPA January 22, 2020 Request for Information PREPA provided EPA with copy of the DNER construction permit application. The copy of the construction application included project compliance applicability, baseline emissions, all emission rates for the units as well as proposed project emission limits
  - Currently no Non PSD applicability evaluation is available. PREPA have been sharing Project information and fulfilling EPA's inquiries.

4. Documento ambiental para las turbinas (Cumplimiento con el Artículo 4(B) de la Ley Núm. 416) y el uso de gas natural y diésel. Este trámite no clasifica como exclusión categórica.

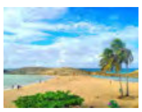
- We have an approved 141-20-0340, copy enclosed.

15. Documento ambiental para la infraestructura de gas natural (Cumplimiento con el Artículo 4(B) de la Ley Núm. 416). Este trámite no clasifica como exclusión categórica.See Item 4.

16. Un plano esquemático que indique el flujo desde el recibo de gas natural hasta el uso final identificando cada fuente de emisión. See enclosed file LNG Supply to Mega Gens Palo Seco Steam Plant.pdf.
17. Procedencia del gas natural. See enclosed file LNG Supply to Mega Gens Palo Seco Steam Plant.pdf.
18. Especificar el método de almacenaje del gas natural. See enclosed file LNG Supply to Mega Gens Palo Seco Steam Plant.pdf.
19. Plan de Reacción a Emergencias de acuerdo con la Regla 107C del RCCA. El plan deberá incluir incidencias de derrames accidentales de gas natural. See enclosed file LNG Supply to Mega Gens Palo Seco Steam Plant.pdf.

De requerir aclaraciones al respecto no dude en comunicarse.

Att.

José A. Santos Jiménez
Manager / Technical Advisor
Puerto Rico Electric Power Authority
Environmental Protection & Quality Assurance Division
jose.santos@prepa.com
787-521-4961


From: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Sent: Wednesday, June 24, 2020 9:22 AM
To: Leimarys Delgado Medero <LeimarysDelgado@jca.pr.gov>; Luis R. Sierra-Torres <LuisSierra@jca.pr.gov>
Cc: Luisette X Ríos Castañer <LUISETTE.RIOS@prepa.com>; Amanda Rodriguez Martinez <AmandaRodriguez@jca.pr.gov>
Subject: Re: <<EXTERNAL EMAIL>>Palo Seco Turbines

Buenos días Leimarys.

Sorry, el orden de número es el aquí incluido. El item 19 es el que comienza en " Plan de Reacción a Emergencias de acuerdo con la Regla 107C del RCCA. El plan deberá...".

Att. J.Santos.

Cual es el item 19?

1. Documento ambiental para la infraestructura de gas natural (Cumplimiento con el Artículo 4(B) de la Ley Núm. 416). Este trámite no clasifica como exclusión categórica. See Item 19.

16.Un plano esquemático que indique el flujo desde el recibo de gas natural hasta el uso final identificando cada fuente de emisión. See Item 19.

17.Procedencia del gas natural. See Item 19.

18.Especificar el método de almacenaje del gas natural. See Item 19.

19.Plan de Reacción a Emergencias de acuerdo con la Regla 107C del RCCA. El plan deberá incluir incidencias de derrames accidentales de gas natural.

- The natural gas equipment onsite will consist solely of the pipeline that transports the natural gas from the supplier to the PWPS model FT8® MOBILEPAC combustion turbines. There will be no storage of natural gas onsite and therefore, an emergency Response Plan in accordance with Rule 107C is not required. The only natural gas equipment to be installed onsite will be the pipeline and associated ancillary equipment (e.g. valves, flanges, connectors, etc.). The PTC application included an estimate of potential fugitive natural gas emissions from the new natural gas handling infrastructure to be installed onsite at the Palo Seco plant. The emission calculations are provided in Appendix B of the application. No additional information regarding the natural gas handling equipment is available at this time. Response as included on the March 05, 2020 electronic mail.

From: Leimarys Delgado Medero <LeimarysDelgado@jca.pr.gov>
Sent: Tuesday, June 23, 2020 8:29 PM
To: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>; Luis R. Sierra-Torres <LuisSierra@jca.pr.gov>
Cc: Luisette X Ríos Castañer <LUISETTE.RIOS@prepa.com>; Amanda Rodriguez Martinez <AmandaRodriguez@jca.pr.gov>
Subject: Re: <<EXTERNAL EMAIL>>Palo Seco Turbines

Saludos

Cual es el item 19?

1. Documento ambiental para la infraestructura de gas natural (Cumplimiento con el Artículo 4(B) de la Ley Núm. 416). Este trámite no clasifica como exclusión categórica. See Item 19.
1. Un plano esquemático que indique el flujo desde el recibo de gas natural hasta el uso final identificando cada fuente de emisión. See Item 19.
1. Procedencia del gas natural. See Item 19.
1. Especificar el método de almacenaje del gas natural. See Item 19.

Leimarys Delgado Medero, P.E.
Chief, Permits and Engineering Division | Air Quality Area
DEPARTMENT OF NATURAL AND ENVIRONMENTAL RESOURCES

From: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Sent: Sunday, June 21, 2020 12:31 PM
To: Luis R. Sierra-Torres <LuisSierra@jca.pr.gov>; Leimarys Delgado Medero <LeimarysDelgado@jca.pr.gov>
Cc: Luisette X Ríos Castañer <luisette.rios@prepa.com>; Amanda Rodriguez Martinez <AmandaRodriguez@jca.pr.gov>
Subject: Re: <<EXTERNAL EMAIL>>Palo Seco Turbines

Saludos Luis, Leimarys.

Enclosed find attachment files and responses to the Palo Seco MobilePac Project inquiries. Most of the items were responded on our March 05, 2020 electronic mail communication.

Outstanding information is related to EPA's PSD applicability evaluation and revision to the environmental document (Rule 141 and categoric exclusion).

The answers are divided in two parts responding to: 1. Luis' April 14, 2020 email request and 2. Leimarys' February 7, 2020 email request.

Please review the enclosed information and let us know if additional information is required. Remaining data will be provided as it becomes available.

Regards;

J.Santos.

1. Luis R. Sierra-Torres electronic communication from April 14, 2020:

Related to the permit application, by this means we are requesting an electronic copy of the emission estimates. Preferably in data sheet format. In order to proceed with the permit application the DNER is also waiting for the response on data information requested by e-mail.

- Electronic spreadsheet is enclosed as "Palo Seco Potential Emissions 12122019.xls"

Related to the waiver, please send us current emission factors for the units (i.e. without control equipment), the January and March fuel consumption reports and emission estimates. If the operation of this emission units operation during a potential waiver could exceed PSD limits, provide with emission projections for the units and date projected to exceed PSD limit.

- Response including the information requested is detailed in the enclosed copy of our recent submittal to EPA regarding the mentioned project. Refer to “PREPA Response to U.S. EPA Questions Regarding Palo Seco Units 06.16.20F.pdf” file.

2. Leimarys Delgado Medero electronic communication from February 7, 2020:

1. Copia de la determinación final de EPA sobre la aplicabilidad o no aplicabilidad del proyecto de la Prevención de Deterioro Significativo (PSD, en inglés) para el proyecto solicitado. Según la carta de la EPA del 23 de julio de 2019, PREPA solicitó una revisión de no aplicabilidad expedita para tres unidades de generación. La EPA establece que PREPA accedió a proveer las razones de emisión por hora de las tres turbinas junto con los niveles de carga para que la EPA pudiera determinar si era posible establecer condiciones de no aplicabilidad para PSD para estas unidades. A la fecha de la comunicación EPA no había recibido dicha información. PREPA alego que el manufacturero de las unidades no había provisto los factores de emisión garantizados y EPA estableció que sin esta información no podrían comenzar la revisión expedita según solicitado.

- Currently no Non PSD applicability evaluation is available. Although, PREPA have been sharing Project information and fulfilling EPA’s inquiries. PREPA will provide details as they become available.

1. Plano de la facilidad (proyectado o existente) indicando todos los puntos de emisión.

- Information provided on March 5, 2020 via email. Enclosed copy of the information as “Facility SIte Source View 02-11-2020 a.pdf” file.

<u>Para las turbinas:</u>

3. Incluir una hoja Parte II para cada unidad por separado. Incluir una identificación para cada turbina.

- Information provided on March 5, 2020 via email. Enclosed copy of the information as “Palo Seco Mega Gens Parte II Solicitud Permiso Construccion 02-26-2020.pdf” file.

4. Documento ambiental para las turbinas (Cumplimiento con el Artículo 4(B) de la Ley Núm. 416) y el uso de gas natural y diésel. Este trámite no clasifica como exclusión categórica.

- Environmental document is under review. Any updates, clarifications or exclusions justifications will be provided.

5. Parámetros de chimenea para cada unidad:
    a. Identificación para cada chimenea
    a. Coordenadas de la chimenea

- Information provided on March 5, 2020 via email. Enclosed copy of the information as “Palo Seco Mega Gens_stack_parameter_02-10-2020.pdf” file.

1. Determinación específica y detallada de la aplicabilidad (incluyendo método de cumplimiento específico) o no aplicabilidad de las siguientes reglamentaciones federales:

    a. 40 CFR Parte 60 Subparte GG: *Standards of Performance for Stationary Gas Turbines.* Solicitado desde el 24 de octubre de 2019.

- Explanation sent via electronic mail on March 5, 2020 via email. As discussed in the Permit to Construct (PTC) application, 40 CFR 60 Subpart KKKK (Standards of Performance for Stationary Combustion Turbines) is applicable to the project as the PW Power Systems (PWPS) model FT8® MOBILEPAC dual fuel combustion turbines have a heat input rating greater than 10 million British Thermal Units per hour (MMBtu/hr) and construction on these turbines commenced after February 18, 2005. In accordance with 40 CFR 60.4305(b), combustion turbines subject to 40 CFR 60 Subpart KKKK are exempt from the requirements of 40 CFR 60 Subpart GG. Since the combustion turbines are subject to Subpart KKKK, they are exempt from Subpart GG.

    b. 40 CFR Parte 63 Subparte YYYY: *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Combustion Turbines.* Deberá tomar en cuenta las enmiendas finalizadas el 31 de enero de 2020.

- Explanation sent via electronic mail on March 5, 2020 via email. As discussed in the Permit To Construct (PTC) application, 40 CFR 63 Subpart YYYY (National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines) is applicable to the PWPS FT8® MOBILEPAC combustion turbines as the facility is an existing major source of hazardous air pollutant (HAP) emissions and the existing and proposed combustion turbines fire oil more than an aggregate total of 1000 hours during the calendar year. Consequently, the combustion turbines must meet a formaldehyde emission limit of 91 parts per billion by volume dry at 15 percent oxygen when firing natural gas and oil.

  On January 31, 2020, the United States Environmental protection Agency (USEPA) issued final amendments to NESHAP Subpart YYYY following the completion of a residual risk and technology review (RTR). The USEPA concluded from the RTR that no new cost-effective controls are available and did not propose any changes to the operating or emission standards. The USEPA did however, issue minor amendments to the rule that will apply to the PWPS FT8® MOBILEPAC combustion turbines, including revising requirements for periods of startup, shutdown and malfunction (SSM) and requiring electronic reporting of performance test results and compliance reports.

  The USEPA amended 40 CFR 63.6105 to eliminate the exemption from the emission and operating limits during SSM periods. Therefore, beginning 180 days after the date of publication of the revised rule in the Federal Register, the formaldehyde emission limit will apply during SSM periods. In accordance with the amended 40 CFR 63.6120(c), performance testing shall be conducted during representative conditions which excludes startup, shutdown, and malfunction. The revised rule has not yet been published in the Federal Register and therefore, the effective date of this rule change is not yet known. As the PWPS FT8® MOBILEPAC combustion turbines will meet the formaldehyde emission limit without add-on pollution controls, there will be no change to the monitoring and reporting requirements as a result of the amended rule.

  Beginning on the effective date of the amended rule, PREPA will submit performance test results and compliance reports through USEPA's Central Data Exchange using the Compliance and Emissions Data Reporting Interface.

<u>Para los motores:</u>

2. Incluir una hoja Parte II para cada motor por separado. Incluir una identificación para cada motor.

- Information provided on March 5, 2020 via email. Enclosed copy of the information as "Palo Seco Mega Gens Parte II Solicitud Permiso Construccion 02-26-2020.pdf" file.

3. Documento ambiental para el uso de gas natural en los motores. (Cumplimiento con el Artículo 4(B) de la Ley Núm. 416). Este trámite no clasifica como exclusión categórica.

- As described in the March 5, 2020 electronic communication, Natural Gas will not be used on emergency engines PS BSG-1, PS BSG-2, PS BSG-3

4. Parámetros de chimenea para cada unidad:

   i. Identificación para cada chimenea
   ii. Coordenadas de la chimenea
   iii. Altura de la chimenea
   iv. Diámetro de salida
   iv. Temperatura de salida
   v. Velocidad de salida

- Enclosed copy of the information as "Palo Seco Mega Gens_stack_parameter_02-10-2020.pdf" file. These details were provided by electronic mail on March 05, 2020.

5. Fecha de orden de cada motor

- May 28, 2019. Informed on the March 05, 2020 electronic mail communication.

6. Foto de la placa de cada motor donde se vea fechas y potencia del motor, si están en la instalación.

- Emergency Generators details enclosed as "Emergency Generators Palo Seco.zip" file. This information was included on the March 05, 2020 communication.

7. Establecer si cada motor cumplirá con la definición de *black start* de la reglamentación federal RICE o se considerarán de emergencia.

- See answer below (Item 13), as presented on the March 05, 2020 communication.

8. Determinación específica y detallada de la aplicabilidad (incluyendo método de cumplimiento específico) o no aplicabilidad de las siguientes reglamentaciones federales:

   a. 40 CFR Parte 60 Subparte IIII: *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*

- Pursuant to 40 CFR 60.4200(a)(4), 40 CFR Part 60 Subpart IIII is applicable to the owners and operators of stationary compression ignition internal combustion engines that commenced construction after July 11, 2005. The three black start generator (BSG) engines are subject to 40 CFR Part 60 Subpart IIII. The three BSG engines meet the criteria of emergency engines pursuant to 40 CFR 60.4219 defined as follows:

    - Emergency stationary internal combustion engine means any stationary reciprocating internal combustion engine that meets all of the criteria in paragraphs (1) through (3) of this definition. All emergency stationary ICE must comply with the requirements specified in §60.4211(f) in order to be considered emergency stationary ICE. If the engine does not comply with the requirements specified in §60.4211(f), then it is not considered to be an emergency stationary ICE under this subpart.

- The stationary ICE is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary ICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary ICE used to pump water in the case of fire or flood, etc.

- The stationary ICE is operated under limited circumstances for situations not included in paragraph (1) of this definition, as specified in §60.4211(f).

- The stationary ICE operates as part of a financial arrangement with another entity in situations not included in paragraph (1) of this definition only as allowed in §60.4211(f)(2)(ii) or (iii) and §60.4211(f)(3)(i).

    - The three BSG engines will be operated only during periods as defined in criteria (1) above, to provide electrical power to the PWPS model FT8® MOBILEPAC combustion turbines during periods when there is no electrical power from the grid (i.e. a blackout). The BSG engines will be operated to comply with 40 CFR 60.4211(f). Therefore, the three BSG engines are subject to the requirements for new emergency engines. There is no separate distinction for black start engines under 40 CFR Part 60 Subpart IIII.

b. 40 CFR Parte 60 Subparte JJJJ: *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*

- Pursuant to 40 CFR 60.4219, compression ignition means a stationary internal combustion engine that is not a spark ignition engine and a spark ignition means a gasoline, natural gas, or liquefied petroleum gas fueled engine or any other type of engine with a spark plug (or other sparking device. Pursuant to 40 CFR 60.4230(a), 40 CFR 60 Subpart JJJJ is applicable to stationary spark ignition internal combustion engines. The three black start generator engines do not have a spark plug and are compression ignition engines, therefore they are not subject to 40 CFR Part 60 Subpart JJJJ.

c. 40 CFR Parte 63 Subparte ZZZZ: *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*

- Pursuant to 40 CFR 63.6585, 40 CFR Part 60 Subpart IIII is applicable to the owners and operators of all stationary compression ignition internal combustion engines located at a major source of HAP emissions that commenced construction after December 19, 2002. The three black start generator (BSG) engines are subject to 40 CFR Part 63 Subpart ZZZZ. 40 CFR Part 63 Subpart ZZZZ provides definitions of both black start and emergency engines pursuant to 40 CFR 63.6675 as follows:

    - Black start engine means an engine whose only purpose is to start up a combustion turbine.
    - Emergency stationary RICE means any stationary reciprocating internal combustion engine that meets all of the criteria in paragraphs (1) through (3) of this definition. All emergency stationary RICE must comply with the requirements specified in §63.6640(f) in order to be considered emergency stationary RICE. If the engine does not comply with the requirements specified in §63.6640(f), then it is not considered to be an emergency stationary RICE under this subpart.
        - The stationary RICE is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary RICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary RICE used to pump water in the case of fire or flood, etc.
        - The stationary RICE is operated under limited circumstances for situations not included in paragraph (1) of this definition, as specified in §63.6640(f).
        - The stationary RICE operates as part of a financial arrangement with another entity in situations not included in paragraph (1) of this definition only as allowed in §63.6640(f)(2)(ii)

or (iii) and §63.6640(f)(4)(i) or (ii).

- The first criteria for an emergency engine is exactly the same as defined under 40 CFR 60.4219 for an emergency engine subject to 40 CFR 60 Subpart IIII. The three BSG engines satisfy both the criteria of a black start engine and an emergency engine under 40 CFR Part 63 Subpart ZZZZ. During an emergency when there is no electrical power from the electrical grid to start the combustion turbines, the BSG engines will be used to start the combustion turbines. The applicable requirements for new emergency engines rated greater than 500 horsepower at a major HAP source have been summarized by the USEPA and available online here https://www3.epa.gov/ttn/atw/rice/pdf/New&Reconemergencyover500HP2b(ii).pdf . The requirements for a new black start engine that meets the criteria of an emergency engine are the same as an emergency engine.

Natural Gas Supply Infrastructure on site:

9. Incluir una hoja Parte II para cada unidad de emisión.

- Enclosed copy of the information as "Palo Seco Mega Gens Parte II Solicitud Permiso Construccion 02-26-2020.pdf" file.

10. Documento ambiental para la infraestructura de gas natural (Cumplimiento con el Artículo 4(B) de la Ley Núm. 416). Este trámite no clasifica como exclusión categórica. See Item 19.
1. Un plano esquemático que indique el flujo desde el recibo de gas natural hasta el uso final identificando cada fuente de emisión. See Item 19.
1. Procedencia del gas natural. See Item 19.
1. Especificar el método de almacenaje del gas natural. See Item 19.
1. Plan de Reacción a Emergencias de acuerdo con la Regla 107C del RCCA. El plan deberá incluir incidencias de derrames accidentales de gas natural.

- The natural gas equipment onsite will consist solely of the pipeline that transports the natural gas from the supplier to the PWPS model FT8® MOBILEPAC combustion turbines. There will be no storage of natural gas onsite and therefore, an emergency Response Plan in accordance with Rule 107C is not required. The only natural gas equipment to be installed onsite will be the pipeline and associated ancillary equipment (e.g. valves, flanges, connectors, etc.). The PTC application included an estimate of potential fugitive natural gas emissions from the new natural gas handling infrastructure to be installed onsite at the Palo Seco plant. The emission calculations are provided in Appendix B of the application. No additional information regarding the natural gas handling equipment is available at this time. Response as included on the March 05, 2020 electronic mail.

From: Luis R. Sierra-Torres <LuisSierra@jca.pr.gov>
Sent: Tuesday, April 14, 2020 1:27 PM
To: José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Cc: Luisette X Ríos Castañer <LUISETTE.RIOS@prepa.com>; Leimarys Delgado Medero <LeimarysDelgado@jca.pr.gov>; Amanda Rodriguez Martinez <AmandaRodriguez@jca.pr.gov>
Subject: <<EXTERNAL EMAIL>>Palo Seco Turbines

Greetings,

On January 2020 the DNER received a permit application for the construction of 3 turbines at Palo Seco site. DNER also received a waiver request for the operation of the after mentioned units due the earthquake emergency.

Related to the permit application, by this means we are requesting an electronic copy of the emission estimates. Preferably in data sheet format. In order to proceed with the permit application the DNER is also waiting for the response on data information requested by e-mail.

Related to the waiver, please send us current emission factors for the units (i.e. without control equipment), the January and March fuel consumption reports and emission estimates. If the operation of this emission units operation during a potential waiver could exceed PSD limits, provide with emission projections for the units and date projected to exceed PSD limit.

Cordially

Eng. Luis R. Sierra
Chief, Inspection and Compliance Divsion
Acting Director, Air Quality Area
Department of Natural and Environmental Resources
Phone: (787) 767-8181 x. 2301

DNER

www.drna.pr.gov/acai

Re: <<EXTERNAL EMAIL>>Solicitud de permiso PREPA Palo Seco PFE-70-0120-0010-II-C

José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Thu 3/5/2020 4:46 PM

To: Leimarys Delgado Medero <LeimarysDelgado@jca.pr.gov>
Cc: Luis R. Sierra-Torres <LuisSierra@jca.pr.gov>; Amanda Rodriguez Martinez <AmandaRodriguez@jca.pr.gov>; Luisette X Ríos Castañer <LUISETTE.RIOS@prepa.com>; Maria V Mercado Rondon <MARIA.MERCADO@prepa.com>

4 attachments (13 MB)

Facility SIte Source View 02-11-2020 a.pdf; Emergency Generators Palo Seco.zip; Palo Seco Mega Gens_stack_parameter_02-10-2020.pdf; Palo Seco Mega Gens Parte II Solicitud Permiso Construccion 02-26-2020.pdf;

Buenas tardes.

Según solicitado incluimos contestación y documentos en referencia a las inquietudes presentadas en el correo electrónico adjunto.

Ver comentarios/respuestas, en azul, a cada una de las preguntas.

Aún estamos trabajando con lo siguiente (sombreado en Amarillo): 1. Información relacionada a la determinación de aplicabilidad de PSD por parte de EPA y 2. Documento ambiental para las turbinas.

Solicitamos mayor tiempo para los dos artículos enumerados arriba, estamos en el proceso de determinar el tiempo necesario para completar los mismos. Proveeremos estimado a la brevedad posible.

Att. J.Santos.

From: Leimarys Delgado Medero <LeimarysDelgado@jca.pr.gov>
Sent: Friday, February 7, 2020 12:25 PM
To: Luisette X Ríos Castañer <LUISETTE.RIOS@prepa.com>
Cc: Luis R. Sierra-Torres <LuisSierra@jca.pr.gov>; José A. Santos Jiménez <JOSE.SANTOS@prepa.com>; Amanda Rodriguez Martinez <AmandaRodriguez@jca.pr.gov>
Subject: <<EXTERNAL EMAIL>>Solicitud de permiso PREPA Palo Seco PFE-70-0120-0010-II-C

Saludos

Hemos evaluado la solicitud de asunto para determinar si la misma está completa. Hemos determinado que la solicitud está incompleta, deberá entregar la siguiente información:

1. Copia de la determinación final de EPA sobre la aplicabilidad o no aplicabilidad del proyecto de la Prevención de Deterioro Significativo (PSD, en inglés) para el proyecto solicitado. Según la carta de la EPA del 23 de julio de 2019, PREPA solicitó una revisión de no aplicabilidad expedita para tres unidades de generación. La EPA establece que PREPA accedió a proveer las razones de emisión por hora de las tres turbinas junto con los niveles de carga para que la EPA pudiera determinar si era posible establecer condiciones de no aplicabilidad para PSD para estas unidades. A la fecha de la comunicación EPA no había recibido dicha información. PREPA alego que el manufacturero de las unidades no había provisto los factores de emisión garantizados y EPA estableció que sin esta información no podrían comenzar la revisión expedita según solicitado.

2. Plano de la facilidad (proyectado o existente) indicando todos los puntos de emisión.
   See enclosed copy

Para las turbinas:

3. Incluir una hoja Parte II para cada unidad por separado. Incluir una identificación para cada turbina.
   See documents enclosed

4. Documento ambiental para las turbinas (Cumplimiento con el Artículo 4(B) de la Ley Núm. 416) y el uso de gas natural y diésel. Este trámite no clasifica como exclusión categórica.
5. Parámetros de chimenea para cada unidad:
   a. Identificación para cada chimenea
   b. Coordenadas de la chimenea

   See documents enclosed

5. Determinación específica y detallada de la aplicabilidad (incluyendo método de cumplimiento específico) o no aplicabilidad de las siguientes reglamentaciones federales:

   a. 40 CFR Parte 60 Subparte GG: *Standards of Performance for Stationary Gas Turbines.* Solicitado desde el 24 de octubre de 2019.

   As discussed in the Permit to Construct (PTC) application, 40 CFR 60 Subpart KKKK (Standards of Performance for Stationary Combustion Turbines) is applicable to the project as the PW Power Systems (PWPS) model FT8® MOBILEPAC dual fuel combustion turbines have a heat input rating greater than 10 million British Thermal Units per hour (MMBtu/hr) and construction on these turbines commenced after February 18, 2005. In accordance with 40 CFR 60.4305(b), combustion turbines subject to 40 CFR 60 Subpart KKKK are exempt from the requirements of 40 CFR 60 Subpart GG. Since the combustion turbines are subject to Subpart KKKK, they are exempt from Subpart GG.

   a. 40 CFR Parte 63 Subparte YYYY: *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Combustion Turbines.*

As discussed in the Permit To Construct (PTC) application, 40 CFR 63 Subpart YYYY (National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines) is applicable to the PWPS FT8® MOBILEPAC combustion turbines as the facility is an existing major source of hazardous air pollutant (HAP) emissions and the existing and proposed combustion turbines fire oil more than an aggregate total of 1000 hours during the calendar year. Consequently, the combustion turbines must meet a formaldehyde emission limit of 91 parts per billion by volume dry at 15 percent oxygen when firing natural gas and oil.

On January 31, 2020, the United States Environmental protection Agency (USEPA) issued final amendments to NESHAP Subpart YYYY following the completion of a residual risk and technology review (RTR). The USEPA concluded from the RTR that no new cost-effective controls are available and did not propose any changes to the operating or emission standards. The USEPA did however, issue minor amendments to the rule that will apply to the PWPS FT8® MOBILEPAC combustion turbines, including revising requirements for periods of startup, shutdown and malfunction (SSM) and requiring electronic reporting of performance test results and compliance reports.

The USEPA amended 40 CFR 63.6105 to eliminate the exemption from the emission and operating limits during SSM periods. Therefore, beginning 180 days after the date of publication of the revised rule in the Federal Register, the formaldehyde emission limit will apply during SSM periods. In accordance with the amended 40 CFR 63.6120(c), performance testing shall be conducted during representative conditions which excludes startup, shutdown, and malfunction. The revised rule has not yet been published in the Federal Register and therefore, the effective date of this rule change is not yet known. As the PWPS FT8® MOBILEPAC combustion turbines will meet the formaldehyde emission limit without add-on pollution controls, there will be no change to the monitoring and reporting requirements as a result of the amended rule.

Beginning on the effective date of the amended rule, PREPA will submit performance test results and compliance reports through USEPA's Central Data Exchange using the Compliance and Emissions Data Reporting Interface.

Deberá tomar en cuenta las enmiendas finalizadas el 31 de enero de 2020.

Para los motores:

1. Incluir una hoja Parte II para cada motor por separado. Incluir una identificación para cada motor.

   See documents enclosed

7. Documento ambiental para el uso de gas natural en los motores. (Cumplimiento con el Artículo 4(B) de la Ley Núm. 416). Este trámite no clasifica como exclusión categórica.

Natural Gas will not be used on emergency engines PS BSG-1, PS BSG-2, PS BSG-3

7. Parámetros de chimenea para cada unidad:

See enclosed table with stack information for Emergency Engines and Turbines

i. Identificación para cada chimenea
ii. Coordenadas de la chimenea
iii. Altura de la chimenea
iv. Diámetro de salida
v. Temperatura de salida
vi. Velocidad de salida

10. Fecha de orden de cada motor

May 28, 2019

10. Foto de la placa de cada motor donde se vea fechas y potencia del motor, si están en la instalación.

See documents enclosed

10. Establecer si cada motor cumplirá con la definición de *black start* de la reglamentación federal RICE o se considerarán de emergencia.

See answer below.

10. Determinación específica y detallada de la aplicabilidad (incluyendo método de cumplimiento específico) o no aplicabilidad de las siguientes reglamentaciones federales:

a. 40 CFR Parte 60 Subparte IIII: *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*

Pursuant to 40 CFR 60.4200(a)(4), 40 CFR Part 60 Subpart IIII is applicable to the owners and operators of stationary compression ignition internal combustion engines that commenced construction after July 11, 2005. The three black start generator (BSG) engines are subject to 40 CFR Part 60 Subpart IIII. The three BSG engines meet the criteria of emergency engines pursuant to 40 CFR 60.4219 defined as follows:

> Emergency stationary internal combustion engine means any stationary reciprocating internal combustion engine that meets all of the criteria in paragraphs (1) through (3) of this definition. All emergency stationary ICE must comply with the requirements specified in §60.4211(f) in order to be considered emergency stationary ICE. If the engine does not comply with the requirements specified in §60.4211(f), then it is not considered to be an emergency stationary ICE under this subpart.

1. The stationary ICE is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary ICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary ICE used to pump water in the case of fire or flood, etc.
2. The stationary ICE is operated under limited circumstances for situations not included in paragraph (1) of this definition, as specified in §60.4211(f).
3. The stationary ICE operates as part of a financial arrangement with another entity in situations not included in paragraph (1) of this definition only as allowed in §60.4211(f)(2)(ii) or (iii) and §60.4211(f)(3)(i).

The three BSG engines will be operated only during periods as defined in criteria (1) above, to provide electrical power to the PWPS model FT8® MOBILEPAC combustion turbines during periods when there is no electrical power from the grid (i.e. a blackout). The BSG engines will be operated to comply with 40 CFR 60.4211(f). Therefore, the three BSG engines are subject to the requirements for new emergency engines. There is no separate distinction for black start engines under 40 CFR Part 60 Subpart IIII.

a. 40 CFR Parte 60 Subparte JJJJ: *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*

Pursuant to 40 CFR 60.4219, compression ignition means a stationary internal combustion engine that is not a spark ignition engine and a spark ignition means a gasoline, natural gas, or liquefied petroleum gas fueled engine or any other type of engine with a spark plug (or other sparking device. Pursuant to 40 CFR 60.4230(a), 40 CFR 60 Subpart JJJJ is applicable to stationary spark ignition internal combustion engines. The three black start generator engines do not have a spark plug and are compression ignition engines, therefore they are not subject to 40 CFR Part 60 Subpart JJJJ.

a. 40 CFR Parte 63 Subparte ZZZZ: *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*

Pursuant to 40 CFR 63.6585, 40 CFR Part 60 Subpart IIII is applicable to the owners and operators of all stationary compression ignition internal combustion engines located at a major source of HAP emissions that commenced construction after December 19, 2002. The three black start generator (BSG) engines are subject to 40 CFR Part 63 Subpart ZZZZ. 40 CFR Part 63 Subpart ZZZZ provides definitions of both black start and emergency engines pursuant to 40 CFR 63.6675 as follows:

> Black start engine means an engine whose only purpose is to start up a combustion turbine.
>
> Emergency stationary RICE means any stationary reciprocating internal combustion engine that meets all of the criteria in paragraphs (1) through (3) of this definition. All emergency stationary RICE must comply with the requirements specified in §63.6640(f) in order to be considered emergency stationary RICE. If the engine does not comply with the requirements specified in §63.6640(f), then it is not considered to be an emergency stationary RICE under this subpart.

1. The stationary RICE is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary RICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary RICE used to pump water in the case of fire or flood, etc.
2. The stationary RICE is operated under limited circumstances for situations not included in paragraph (1) of this definition, as specified in §63.6640(f).
3. The stationary RICE operates as part of a financial arrangement with another entity in situations not included in paragraph (1) of this definition only as allowed in §63.6640(f)(2)(ii) or (iii) and §63.6640(f)(4)(i) or (ii).

The first criteria for an emergency engine is exactly the same as defined under 40 CFR 60.4219 for an emergency engine subject to 40 CFR 60 Subpart IIII. The three BSG engines satisfy both the criteria of a black start engine and an emergency engine under 40 CFR Part 63 Subpart ZZZZ. During an emergency when there is no electrical power from the electrical grid to start the combustion turbines, the BSG engines will be used to start the combustion turbines. The applicable requirements for new emergency engines rated greater than 500 horsepower at a major HAP source have been summarized by the USEPA and available online here https://www3.epa.gov/ttn/atw/rice/pdf/New&Reconemergencyover500HP2b(ii).pdf. The requirements for a new black start engine that meets the criteria of an emergency engine are the same as an emergency engine.

Natural Gas Supply Infrastructure on site:

14. Incluir una hoja Parte II para cada unidad de emisión.
15. Documento ambiental para la infraestructura de gas natural (Cumplimiento con el Artículo 4(B) de la Ley Núm. 416). Este trámite no clasifica como exclusión categórica.
16. Un plano esquemático que indique el flujo desde el recibo de gas natural hasta el uso final identificando cada fuente de emisión.
17. Procedencia del gas natural.
18. Especificar el método de almacenaje del gas natural.
19. Plan de Reacción a Emergencias de acuerdo con la Regla 107C del RCCA. El plan deberá incluir incidencias de derrames accidentales de gas natural.

The natural gas equipment onsite will consist solely of the pipeline that transports the natural gas from the supplier to the PWPS model FT8® MOBILEPAC combustion turbines. There will be no storage of natural gas onsite and therefore, an emergency Response Plan in accordance with Rule 107C is not required. The only natural gas equipment to be installed onsite will be the pipeline and associated ancillary equipment (e.g. valves, flanges, connectors, etc.). The PTC application included an estimate of potential fugitive natural gas emissions from the new natural gas handling infrastructure to be installed onsite at the Palo Seco plant. The emission calculations are provided in Appendix B of the application. No additional information regarding the natural gas handling equipment is available at this time.

Esta solicitud de información es preliminar, una vez se evalué la parte técnica de los cálculos de emisión en detalle o la información entregada podríamos solicitar información adicional para poder establecer los requisitos aplicables estatales y federales.

Le concedemos hasta el **9 de marzo de 2020** para entregar toda la información requerida.

Cordialmente,

Leimarys Delgado Medero, P.E.

Jefa, Permisos e Ingeniería | **Área de Calidad de Aire**
DEPARTAMENTO DE RECURSOS NATURALES Y AMBIENTALES
P.O. Box 11488 San Juan PR 00910
☎: (787) 767-8181 Ext. 2310

Info on Waiver PS Emergency Turbines

José A. Santos Jiménez <JOSE.SANTOS@prepa.com>
Tue 11/26/2019 11:39 AM
To: Jon, Frank <Jon.Frank@epa.gov>
Cc: Maria V Mercado Rondon <MARIA.MERCADO@prepa.com>; Luisette X Ríos Castañer <LUISETTE.RIOS@prepa.com>

3 attachments (13 MB)
Solicitud de dispensa DRNE Instalacion turbinas FT8 Palo Seco 10-11-2019.pdf; Dispensa PREPA Palo Seco 24oct19.pdf; PREPA San Juan 0365C mod LNG 3oct2019.pdf;

Saludos Frank.

Per your request during today' call.

Enclosed find copy of the DNER waiver request for the Palo Seco Emergency Turbines and DNER's approval of the same.

As discussed we are preparing the DRNE construction application for the mentioned turbines.

Also enclosed find copy of the permit to construct issued by DNER, for the San Juan Units 5 and 6 Dual fuel conversion.

Let me know if additional information is needed.

Regards;
J.Santos.

10 de febrero de 2021

Victor V. De Castro Carlo
Puerto Rico Electric Power Authority (PREPA) Palo Seco
PO Box 364267
San Juan, PR 00949

ENM. 141-20-0340
Generadores de Emergencia
Palo Seco Power Plant
PR-870, Palo Seco
Toa Baja, Puerto Rico

Estimado señor De Castro:

El Área de Evaluación de Documentos Ambientales adscrita a la Secretaría Auxiliar de Cumplimiento Ambiental del Departamento de Recursos Naturales y Ambientales (DRNA) recibió el 10 de febrero del 2021, la comunicación del Ing. Ricardo Ramos De Juan, que lee como sigue:

"Por este medio la Autoridad de Energía de Puerto Rico – División de Ingeniería y Servicios Técnicos por conducto del Ing. Ricardo Ramos De Juan solicita – una Evaluación Ambiental bajo la Regla 141 para Tres unidades de turbo generadores móviles generatricesde 30 MW cada una United Technologies Pratt & Whitney (descripción abajo). Se incluye la data técnica y cálculos de emisión. Las unidades se ubicaran en PREPA Palo Seco, ubicada en la PR-870, en Toa Baja.

Se aclara que dichas unidades son Unidades Peaking.

Dichas Unidades Peaking tendrán un uso de operación se estima en 2,680 horas / año.

I. <u>Unidad Peaking- Movil</u>

El generador es marca: Brush Electrical Machines
Modelo Frame no. MXI 44.07 no. 925501.00, 30,000 KW
Motor marca United Technologies Pratt & Whitney,
Modelo FT8, GG8-3 / PT8-6. Caballaje: 40,800 HP
Tiempo de operación se estima en 2,680 hrs/yr.
El consumo de combustible es de 1,980 gal/hr
Combustible utilizado: Dual Fuel (diésel y gas natural)
Tubo de escape: largo de 120 pulgadas, ancho de 140 pulgadas y altura de 244.75 pulgadas.

II. Unidad Peaking- Movil

El generador es marca Toshiba Mitsubishi-Electrical System Corporation
Modelo: Serial #D1577020AW,30,000 KW
Motor marca United Technologies Pratt & Whitney
Modelo GG8-3 / PT8-6. Caballaje: 40,800 HP
Tiempo de operación se estima en 2,680 hrs/yr.
El consumo de combustible es de 1980 gal/hr
Combustible utilizado: Dual Fuel (diésel y gas natural)
Tubo de escape: largo de 120 pulgadas, ancho de 60 pulgadas y altura de 244.75 pulgadas.

III. Unidad Peaking- Movil

El generador es marca Toshiba Mitsubishi-Electrical System Corporation
Modelo: Serial #D1580200AW, 30,000 KW
Motor marca United Technologies Pratt & Whitney
Modelo GG8-3/PT8-6. Caballaje: 40,800 HP
Tiempo de operación se estima en 2,680 hrs/yr.
El consumo de combustible es de 1980 gal/hr
Combustible utilizado: Dual Fuel (diésel y gas Natural)
Tubo de escape: largo de 120 pulgadas, ancho de 140 pulgadas y altura de 244.75 pulgadas.

Las tres unidades utilizan un tanque de acero externo con dique de capacidad de 670,316 galones".

La Secretaria Auxiliar de Cumplimiento Ambiental del DRNA (anterior Junta de Calidad Ambiental), amparada en la Regla 141 del Reglamento Núm. 8858 del 23 de noviembre de 2016, conocido como el "Reglamento Para el Proceso de Evaluación Ambiental (RPEA)" ha determinado que la acción propuesta no ocasionará impactos significativos al ambiente. El documento sometido para la acción propuesta cumple con lo requerido en el Artículo 4-B (3) de la Ley sobre Política Pública Ambiental, Ley 416-2004, según enmendada.

No obstante, se le requiere que cumpla con todas las disposiciones de las leyes y reglamentos estatales y federales aplicables, incluyendo las siguientes:

1. Obtener los correspondiente permisos o modificaciones de permisos de construcción y operación, otorgados por el Área de Calidad de Aire, conforme al Reglamento Núm. 5300 del 28 de agosto de 1995, conocido como el "Reglamento para el Control de la Contaminación Atmosférica".

2. Las especificaciones y nuevos cálculos de emisiones certificados por un ingeniero o químico licenciado y autorizado a ejercer su profesión en Puerto Rico, deberán incluirse durante el proceso de modificación o solicitud del permiso.

3. Controlar los olores objetables que puedan afectar la atmósfera comunal.

4. Revisar el Plan de Emergencia de la facilidad de referencia de manera que este incluya todos los tanques sobre tierra que se utilicen para almacenar combustible(s) o sustancias químicas; y de ser necesario se deberá presentar el mismo ante el Área de Calidad de Agua, reflejando las acciones a tomar para evitar, controlar y remediar derrames de combustible(s) o cualquier otra sustancia química, a tenor con la Regla 1306.5 del Reglamento Núm. 9079 del 26 de abril de 2019, conocido como el “Reglamento de Estándares de Calidad de Agua de Puerto Rico”.

5. Cumplir con el Reglamento Núm. 8019 del 9 de mayo de 2011, conocido como el “Reglamento para el Control de la Contaminación por Ruido” en lo relacionado al nivel de sonido máximo permitido.

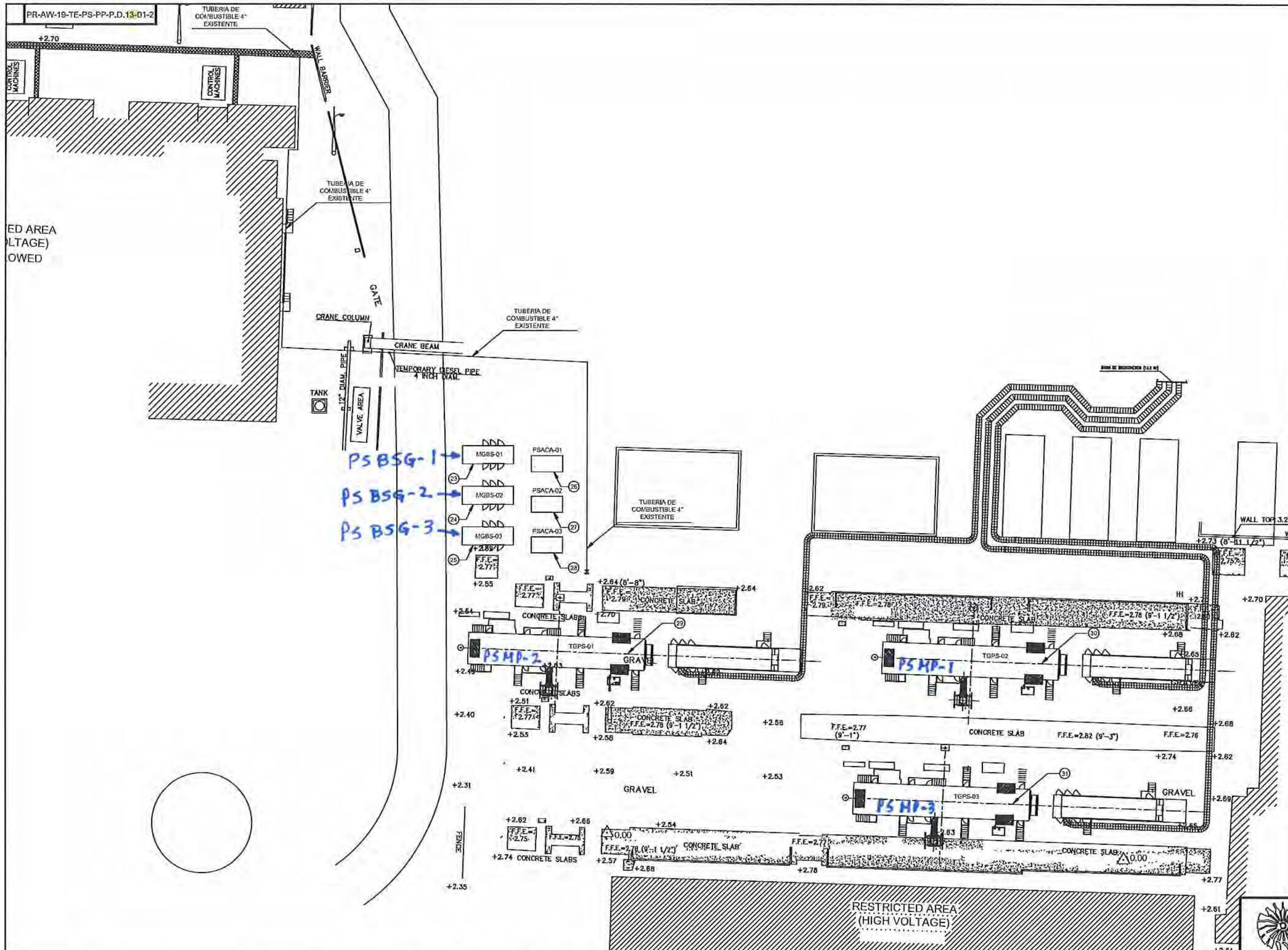
6. Según la Regla 138 (Vigencia de la Determinación de Cumplimiento Ambiental), Inciso C del RPEA, la vigencia de la determinación de cumplimiento ambiental a tenor con la Regla 141 será de cinco (5) años o hasta la fecha límite para el comienzo de la acción propuesta o hasta que se otorgue o modifique el permiso solicitado, lo que ocurra primero.

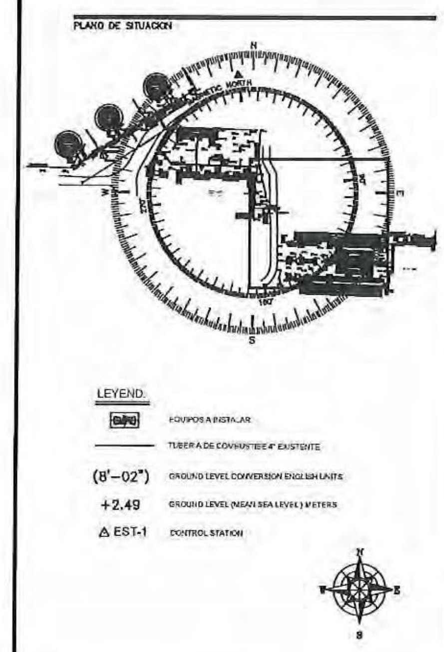
Las recomendaciones presentadas en esta comunicación, no eximen de cumplir con cualquier otro requerimiento o permiso del DRNA o de cualquier otra agencia estatal o federal, que sean aplicables a la acción propuesta.

Cordialmente,

Ing. Luis Sierra
Secretario Auxiliar
Secretaria Auxiliar de Permisos
Endosos, y Servicios Especializados

ADL/adl





LISTA DE EQUIPOS

PTO	TAG	DESCRIPCION	NORTE	ESTE
23	MGBS-01	MOTOGENERADOR DIESEL - BLACK START 01	268815.30	230005.03
24	MGBS-02	MOTOGENERADOR DIESEL - BLACK START 02	268810.81	230005.03
25	MGBS-03	MOTOGENERADOR DIESEL - BLACK START 03	268806.23	230005.03
26	PSACA-01	Paquete de SACA 01	268814.37	230011.67
27	PSACA-02	Paquete de SACA 02	268809.79	230011.67
28	PSACA-03	Paquete de SACA 03	268805.21	230011.67
29	TGPS-01	Turbogenerador Palo Seco 01	268.793.20	230.012.88
30	TGPS-02	Turbogenerador Palo Seco 02	268.792.15	230.059.46
31	TGPS-03	Turbogenerador Palo Seco 03	268.778.32	230.038.23

REVISIONS				REVISIONS				REFERENCE DRAWINGS		COORDINATED		
NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NUMBER	TITLE	DEPARTMENT	SIGNATURE	DATE
										ARCHITECTURAL		
										CIVIL		
										ELECTRICAL		
										MECHANICAL		

DESIGNED
SURVEYED
DRAWN
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

LIC. # DATE

PUERTO RICO ELECTRIC POWER AUTHORITY CORPORATE SEAL

Wellington Turbines LLC

PRECISION CORP.

PUERTO RICO ELECTRIC POWER AUTHORITY
ENGINEERING DIVISION

SAN JUAN, PUERTO RICO – PLANTA PALO SECO
PLOT PLANT

SCALE: 1:200 | SAN JUAN, PUERTO RICO | HOJA 02 DE 02

LNG Storage & Regasification Facility to PW Mega Gens

Palo Seco Steam Plant

General Description

The revised LNG storage and regasification facility is a transitional infrastructure project to supply natural gas for three PW Mobile Gas turbines until such time as a natural gas pipeline is available.

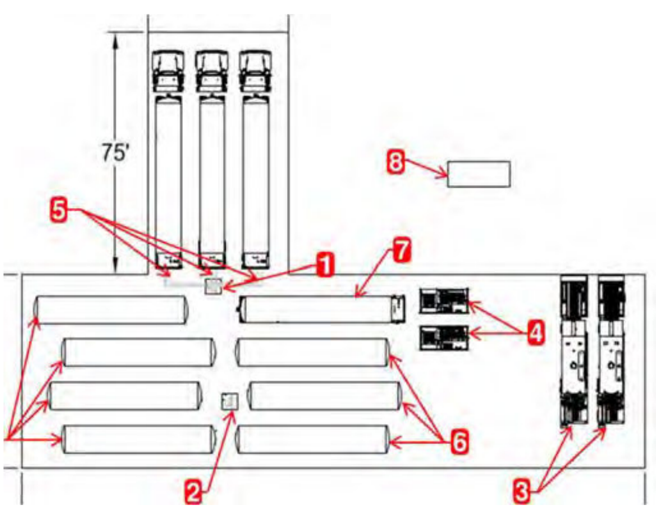
The project consists of seven (7) 15,000-gallon horizontal ISO tank trailers mounted to serve as storage LNG tanks, interconnected to one trailer mounted buffer ISO tank of 16,000 gallons that will feed two trailer mounted ambient air vaporizers via two high pressure pump skid units. One off-load pump station for three trucks will fill the trailer mounted tanks and one transfer pump will maintain levels on the buffer tank. The facility will have a control room trailer. All trailer mounted equipment will be anchored to the ground to resist winds of up to 150 mph. The applicable design code for the ISO tanks mounted trailer is ASME SEC VIII DIV 1, CGA 341, MC-338. The natural gas pipe will be above ground, exposed except where there is a road junction.

The pipeline and other natural gas handling equipment onsite will be physically separated to be protected from physical damage due to onsite activities.

The infrastructure, as described, occupies a footprint of approximately 17,000 ft². The available area for development is approximately 40,000 ft². It will be located south of the warehouse building west side of the six frame 5000 gas turbines, and approximately 660 feet from the Mobile Gens fence. Secondary containment is considered, and NFPA compliance protection devices are going to be provided. Conceptual Layout is presented as **Appendix 1**.

This facility will be designed to provide natural gas to the three Mobile Gen Units at full load for approximately 10 hours a day. The refill LNG truck operated by an independent natural gas supplier will travel from the San Juan Port Terminal by truck via state road PR 167 by an.

Conceptual Layout



Legend

1. Offload Pump
2. Transfer Pump
3. Ambient Air Vaporizers
4. High Pressure Pump Skid
5. One LNG ISO-Tank offload manifold connecting three ISOs at a time for LNG unloading
6. ISO tanks for storage
7. ISO tank for buffer
8. Control Room

LNG Supply to Mega Gens Palo Seco Steam Plant.pdf

Note: The Layout shown represent the basis of design of the project. Final design may vary. The quantity of tanks considered are seven. See sample arrangement on **Appendix 2**.

The ambient air vaporizers do not require flares and do not require any new combustion sources. Therefore, fugitive emission estimates have been updated only to reflect the new natural gas storage and supply infrastructure.

The updated potential fugitive emissions estimates indicate a reduction of volatile organic compound (VOC) emissions from 0.55 to 0.43 tons per year (tpy) as shown on the image below (See **Appendix 3**):

Potential Emissions - Palo Seco Natural Gas Handling System Fugitive Emissions

Emission Factors	
Source Type	Gas (kg/hr/source)
Flanges (Vapor)	0.00039
Flanges (Liquid)	0.00011
Valves (Vapor)	0.0045
Valves (Liquid)	0.0025
Others (compressors, drains, instruments, meters, PSVs, vents) (Vapor)	0.0088

Emission factors are from EPA's "Protocol for Equipment Leak Emissions Estimates" Table 2-4 (November 1995)

Potential Emissions					
Source Type	Source Type Used	Count	All Gas (tpy)	VOC (tpy)	GHG (tpy)
Flange (Vapor)	Flanges	4	0.015	0.002	0.3
Flange (Liquid)	Flanges	21	0.022	0.002	0.5
Valves (Vapor)	Valves	5	0.217	0.022	4.9
Valves (Liquid)	Valves	42	1.014	0.101	22.8
Vents, Drains, PIs, Lis, PSVs (Vapor)	Others	36	3.060	0.306	68.8
TOTALS			**4.33**	**0.43**	**97.4**
LNG estimated to have combined methane and ethane content >95% but emissions conservatively assume a VOC content of 10 percent.					
GHG emissions based upon all non-VOC emissions being methane with a global warmng potential of 25 (see 40 CFR 98, Subpart A, Table A-1)					

$$GHG\left(\frac{ton}{year}\right) = \left[All\ gas\left(\frac{ton}{year}\right) - VOC\left(\frac{ton}{year}\right)\right] X\ 25$$

Compliance with Rules 107 PR RCAP & Accidental Release Program Regulation Under 40 C.F.R. Part 68

The liquified natural gas storage and vaporizing system will not trigger Emergency Response Plan requirements in accordance with Rules 107C and 107D under the Puerto Rico Regulation for the Control of Atmospheric Pollution (PR RCAP) and Accidental Release Program Regulation under 40 C.F.R. Part 68, as presented in our March 05,2020, June21, 2020 and June24, 2020 communications. Below see extended discussion on the mentioned compliance requirements and considerations subject to the updated natural gas supply and storage infrastructure.

1. Rule 107 states that it “is designed to prevent the excessive buildup of air pollutants during air pollution episodes, thereby preventing the occurrence of an emergency, due to the effects of these pollutants on the health of persons, and to provide with accident prevention and emergency response requirements.” All of the natural gas handling equipment will be located outdoors. The molecular weight of natural gas is approximately 19 pounds per pound mole (lb/lb-mole) as compared to the molecular weight of dry air of approximately 29 lb/lb-mole. Therefore, natural gas is significantly lighter than air and any leaks will quickly rise and disperse in the atmosphere and not “buildup”.

2. Rule 107C requires an Emergency Response Plan for any facility subject to Rule 107 that may “release, leak or emit toxic or hazardous substances into the atmosphere”. The definition of Toxic or Hazardous Substances under Rule 102 is provided below. Natural gas, which will be comprised of 95% or more of ethane with low concentrations of other hydrocarbons, water, carbon dioxide, nitrogen, oxygen, and some sulfur compounds, does not meet the Rule 102 definition of a toxic or hazardous substance. The United States Energy Information Administration states that liquified natural gas is nontoxic (see page 3 in this EIA publication https://www.energy.gov/sites/prod/files/2013/04/f0/LNG_primerupd.pdf).

   Per Rule 102, toxic substances are classified on the basis of their adverse health effects in a biologic system. A toxic substance might be classified as a chemical carcinogen, genotoxic agent, developmental toxicant, reproductive toxicant, systemic toxicant, and/or sensory irritant.

   (i) Natural gas is not a chemical carcinogen that has the ability to induce neoplasms in animals or humans.
   (ii) Natural gas is not a genotoxic agent that may cause heritable changes or damage leading to heritable changes in genetic material.
   (iii) Natural gas is not a developmental toxicant is a substance that may cause adverse effects on the developing organism from exposure prior to conception (either parent), during prenatal development, or postnatally to the time of sexual maturation.
   (iv) Natural gas is not a reproductive toxicant that may induce a dysfunction affecting the processes of gametogenesis from its earliest stage to implantation of the conceptus in the endometrium.
   (v) Natural gas is not a systemic toxicant that may produce adverse effects on the function of various organ systems exclusive of cancer, genotoxicity, and developmental/reproductive toxicity.
   (vi) Natural gas is not a sensory irritant which when inhaled via the nose will stimulate trigeminal nerve endings, evoke a burning sensation of the nasal passages, and inhibit respiration; induce coughing from laryngeal stimulation; or is capable of stimulating trigeminal nerve endings of the cornea and induce tearing; at high concentrations, particularly on moist facial skin, sensory irritants are capable of inducing a burning sensation; some have odorant and/or gustatory qualities; most will induce bronchoconstriction, usually at concentrations in the air higher than required for stimulation of nerve endings in the nasal passages. Although the natural gas provided to Palo Seco will be odorized for safety reasons for the prevention of fires, the expected minor leaking of natural gas from the handling equipment (as quantified in Appendix B of the air permit application) will not “buildup” but will quickly rise and disperse in the air and not be detectable offsite. Natural gas is not a sensory irritant as otherwise defined under Rule 102.

Natural gas is not a hazardous substance as it is not an air pollutant listed pursuant to Section 112(b) of the Clean Air Act Amendments of 1990.

Rule 102 - Toxic or Hazardous Substances

A. any chemical substance causing adverse effects on living organisms following ingestion, inhalation, topical or other parenteral exposure. An adverse effect includes any alteration in structure or function that is clearly deleterious to the organism causing that the body's normal compensatory and protective mechanisms become overwhelmed, resulting in irreversible or only partially reversible functional changes. For regulation purposes, toxic substances are classified henceforth on the basis of their adverse health effects in a biologic system. A toxic substance might be classified as a chemical carcinogen, genotoxic agent, developmental toxicant, reproductive toxicant, systemic toxicant, and/or sensory irritant. A chemical carcinogen is a type of toxic substance. A genotoxic agent is a substance that may cause heritable changes or damage leading to heritable changes in genetic material. A developmental toxicant is a substance that may cause adverse effects on the developing organism from exposure prior to conception (either parent), during prenatal development, or postnatally to the time of sexual maturation. A reproductive toxicant is a substance that may induce a dysfunction affecting the processes of gametogenesis from its earliest stage to implantation of the conceptus in the endometrium. A systemic toxicant is a substance that may produce adverse effects on the function of various organ systems exclusive of cancer, genotoxicity, and developmental/reproductive toxicity. A.

B. Any air pollutants listed pursuant to Section 112(b) of the Clean Air Act Amendments of 1990.

C. Any air pollutants not listed pursuant to Section 112(b) of the Clean Air Act Amendments of 1990, but identified by the Board through emission inventories or by other means and that is in conformity with the part (A) of this definition.

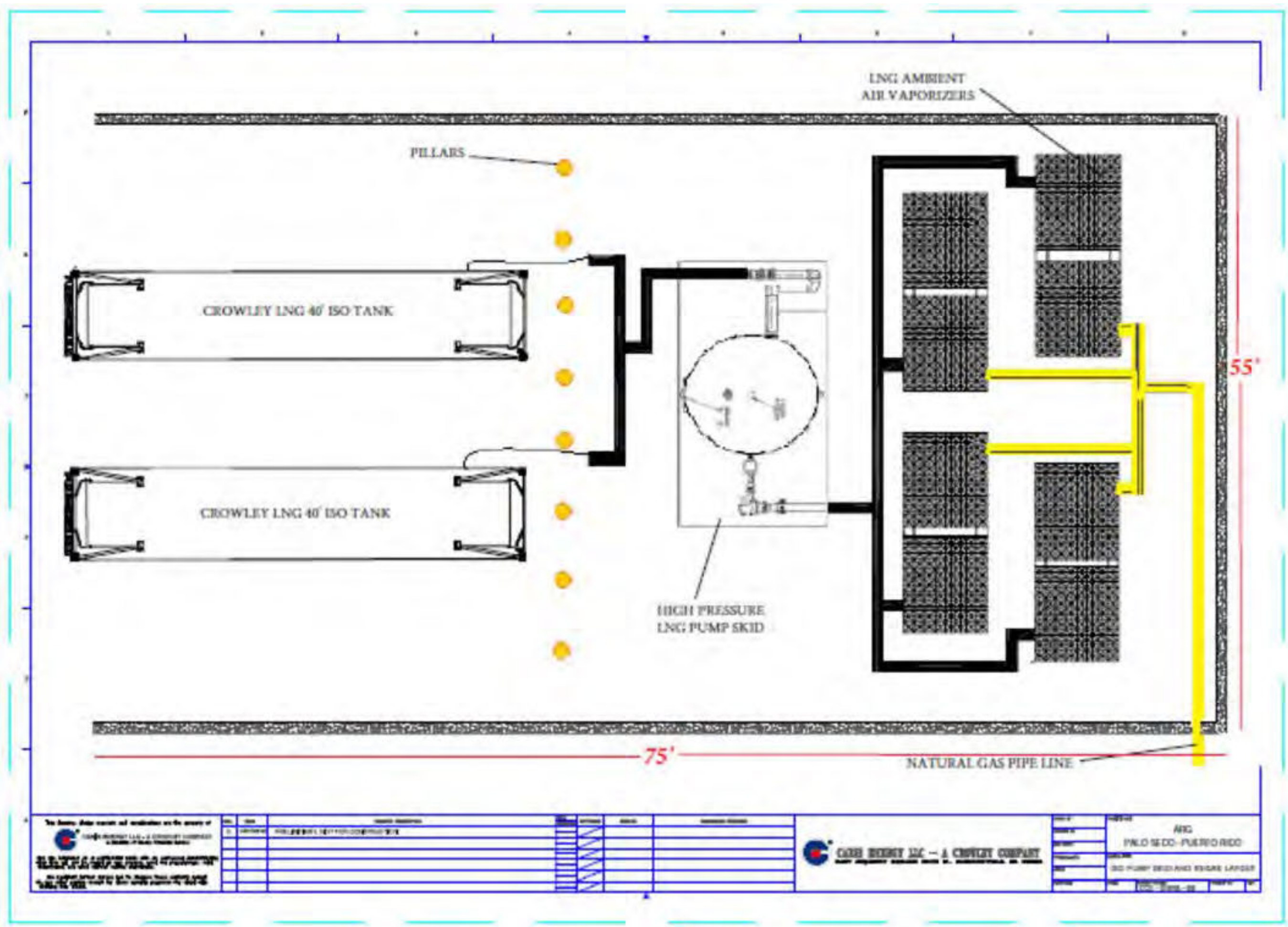
The Accidental Release Program regulation 40 C.F.R. § 68.126 Exclusion states "*Flammable Substances Used as Fuel or Held for Sale as Fuel at Retail Facilities*. A flammable substance listed in Tables 3 and 4 of § 68.130 is nevertheless excluded from all provisions of this part when the substance is used as a fuel or held for sale as a fuel at a retail facility." The onsite Natural Gas (methane/ethane) stored in the facility will be used as a fuel qualifying as exempt from the program (40 C.F.R. § 68.126) and therefore a Risk Management Plan is not required at Palo Seco for the LNG storage and Rule 107(D) also does not apply.

Appendix 1

Palo Seco Natura Gas Storage & Supply Conceptual Arrangement

Appendix 2

LNG ISO Tank Offloading and Vaporizing – Sample Layout/Arrangement



Appendix 3

Potential Emissions - Palo Seco Natural Gas Handling System Fugitive Emissions

Emission Factors	
Source Type	**Gas (kg/hr/source)**
Flanges (Vapor)	0.00039
Flanges (Liquid)	0.00011
Valves (Vapor)	0.0045
Valves (Liquid)	0.0025
Others (compressors, drains, instruments, meters, PSVs, vents) (Vapor)	0.0088

Emission factors are from EPA's "Protocol for Equipment Leak Emissions Estimates" Table 2-4 (November 1995)

Potential Emissions					
Source Type	**Source Type Used**	**Count**	**All Gas (tpy)**	**VOC (tpy)**	**GHG (tpy)**
Flange (Vapor)	Flanges	4	0.015	0.002	0.3
Flange (Liquid)	Flanges	21	0.022	0.002	0.5
Valves (Vapor)	Valves	5	0.217	0.022	4.9
Valves (Liquid)	Valves	42	1.014	0.101	22.8
Vents, Drains, PIs, LIs, PSVs (Vapor)	Others	36	3.060	0.306	68.8
TOTALS			**4.33**	**0.43**	**97.4**

LNG estimated to have combined methane and ethane content >95% but emissions conservatively assume a VOC content of 10 percent.

GHG emissions based upon all non-VOC emissions being methane with a global warmng potential of 25 (see 40 CFR 98, Subpart A, Table A-1)

$$GHG\left(\frac{ton}{year}\right) = [All\ gas\left(\frac{ton}{year}\right) - VOC\left(\frac{ton}{year}\right)]\ X\ 25$$

12789 PE
1/26/2021

Appendix 3 – Cont.

Ing. Jaime A. Umpierre, PREPA Employee # 9436

empleado 9436

CERTIFICO COPIA FIEL Y EXACTA DEL DOCUMENTO ORIGINAL

Supervisora Asuntos ... 8425

Nombre

3-19-2018

Fecha

ACUSE

RENOVACIÓN APROBADA: 20 de septiembre, 2017

RENEWAL APPROVED ON: September 20, 2017

Gobierno de Puerto Rico
Government of Puerto Rico

DEPARTAMENTO DE ESTADO
Department of State

Secretaría Auxiliar de Juntas Examinadoras
Office of the Assistant Secretary of State for Examining Boards

La Junta Examinadora de Ingenieros y Agrimensores
The Examining Board of Engineers and Land Surveyors

por la presente certifica que
hereby certifies that

Jaime A Umpierre Montalvo

habiendo cumplido todos los requisitos de Ley, se ha inscrito en el Registro de esta Junta como
having met all the requirements of law, has been registered as:

Ingeniero Licenciado
Licensed Engineer

En testimonio de lo cual, se expide esta licencia para el ejercicio de dicha profesión, bajo el sello de la Junta Examinadora.
In testimony whereof, this license is issued to practice this profession, under the seal of the Board of Examiners.

En San Juan, Puerto Rico, efectivo 09 de octubre de 2017
In San Juan, Puerto Rico, effective October 09, 2017.

Número de Licencia: 12789
License Number

Vencimiento: 08 de octubre de 2022
Expires: October 08, 2022

Presidente

Directora
Director

GOBIERNO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

PUERTO RICO VERDE

Área de Calidad de Aire

SOLICITUD DE PERMISO PARA LA CONSTRUCCIÓN U OPERACIÓN DE FUENTES DE EMISIÓN EN PUERTO RICO

PARTE II - PROCESO DE LA PLANTA Y DESCRIPCIÓN DE EMISIONES

I. EMISIONES INDUSTRIALES: (Movimiento de terreno, almacenaje en tanques, talleres de pintado, etc.)

1. Descripción del proceso u operación que emite contaminantes atmosféricos:
N/A
2. Materia prima usada o procesada: ______ Tipo ______ Cantidad ______ (unidad/unidad tiempo)
3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
pies	pulg.	°F	pies/seg.
pies	pulg.	°F	pies/seg.

5. Volumen de descarga de emisiones: ______ Pies^3/min.
6. Emisiones actuales: Estimado basado en: ______.

Tipo de contaminante	Cantidad (masa/tiempo)	Duración (tiempo/unidad tiempo)

7. Incluya un diagrama de flujo del proceso (tipo bloque) demostrando puntos, cantidades y tipos de emisiones.

II. EMISIONES POR COMBUSTIÓN: (Calderas, calentadores, plantas de emergencia, bombas de incendio, etc.)

1. Equipo de combustión: **PS BSG-1** Caterpillar C13 Emergency Diesel Generator (Tipo) ______ (BTU/hr) 609 Hp (HP)
2. Combustible:

Tipo	Gal/hr ó Lb/hr	% azufre
Distillate Oil	28.4 gal/Hr	.0015 wt%

3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso
N/A	N/A

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
9.4 pies	5" pulg.	1059 °F	104.5 pies/seg.

III. EMISIONES POR INCINERACIÓN O DISPOSICIÓN DE DESPERDICIOS: (Sólidos, líquidos, gaseosos)

1. Método para disponer los desperdicios: N/A.
2. Tipo de desperdicios: ______ Cantidad: ______ Lb/día.
3. Incinerador: ______ Tipo ______ Marca ______ Capacidad (Lb/día).
4. Chimenea: ______ Pies (Altura) ______ Pies (Diámetro Salida) ______ °F (Temp. Salida) ______ Pies/seg. (Velocidad Salida)
5. Combustible auxiliar: Tipo ______ Gal/hr ó Lb/hr ______ % azufre ______
6. Equipo de control: ______ Tipo ______ % por peso. Eficiencia

IV. CUMPLIMIENTO: Incluya datos o información demostrando que las emisiones no exceden los límites establecidos.
V. EQUIPO DE CONTROL: Incluya esquema de la instalación del equipo de control de la fuente de emisión.

CERTIFICACIÓN DE UN INGENIERO, QUÍMICO O ARQUITECTO LICENCIADO

Certifico que estoy registrado y autorizado para practicar mi profesión en Puerto Rico; que el equipo y medidas para el control de emisiones son adecuadas y cumplen con las disposiciones del Reglamento de Control de Contaminantes Atmosféricos de la Junta de Calidad Ambiental de Puerto Rico y que, de acuerdo a mis mejores conocimientos y creencias, la información suministrada es veraz, completa y exacta.

17776-PE — Número de Licencia
Ing. Efran Paredes Maisonet — Nombre (Letra de molde)
Firma

EFRAN PAREDES MAISONET INGENIERO LICENCIADO LIC. #17776 PUERTO RICO

Fecha: ______. Número de solicitud: ______.

GOBIERNO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

PUERTO RICO VERDE

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N/A
2. Materia prima usada o procesada: ________ Tipo ________ Cantidad ________ (unidad/unidad tiempo)
3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
pies	pulg.	°F	pies/seg.
pies	pulg.	°F	pies/seg.

5. Volumen de descarga de emisiones: ________ Pies^3/min.
6. Emisiones actuales: Estimado basado en: ________.

Tipo de contaminante	Cantidad (masa/tiempo)	Duración (tiempo/unidad tiempo)

7. Incluya un diagrama de flujo del proceso (tipo bloque) demostrando puntos, cantidades y tipos de emisiones.

II. EMISIONES POR COMBUSTIÓN: (Calderas, calentadores, plantas de emergencia, bombas de incendio, etc.)

1. Equipo de combustión: **PS BSG-2** Caterpillar C13 Emergency Diesel Generator (Tipo) ________ (BTU/hr) 609 Hp (HP)
2. Combustible:

Tipo	Gal/hr ó	Lb/hr	% azufre
Distillate Oil	28.4 gal/Hr		.0015 wt%

3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso
N/A	N/A

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
9.4 pies	5" pulg.	1059 °F	104.5 pies/seg.

III. EMISIONES POR INCINERACIÓN O DISPOSICIÓN DE DESPERDICIOS: (Sólidos, líquidos, gaseosos)

1. Método para disponer los desperdicios: N/A.
2. Tipo de desperdicios: ________ Cantidad: ________ Lb/día.
3. Incinerador: ________ Tipo ________ Marca ________ Capacidad (Lb/día).
4. Chimenea: ________ Pies (Altura) ________ Pies (Diámetro Salida) ________ °F (Temp. Salida) ________ Pies/seg. (Velocidad Salida)
5. Combustible auxiliar: Tipo ________ Gal/hr ó Lb/hr ________ % azufre ________
6. Equipo de control: ________ Tipo ________ Eficiencia % por peso.

IV. CUMPLIMIENTO: Incluya datos o información demostrando que las emisiones no exceden los límites establecidos.
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Número de Licencia

Ing. Efran Paredes Maisonet
Nombre (Letra de molde)

Firma

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1. Descripción del proceso u operación que emite contaminantes atmosféricos:
N/A

2. Materia prima usada o procesada: ______ Tipo ______ Cantidad ______ (unidad/unidad tiempo)

3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
pies	pulg.	°F	pies/seg.
pies	pulg.	°F	pies/seg.

5. Volumen de descarga de emisiones: ______ Pies^3/min.
6. Emisiones actuales: Estimado basado en: ______.

Tipo de contaminante	Cantidad (masa/tiempo)	Duración (tiempo/unidad tiempo)

7. Incluya un diagrama de flujo del proceso (tipo bloque) demostrando puntos, cantidades y tipos de emisiones.

II. EMISIONES POR COMBUSTIÓN: (Calderas, calentadores, plantas de emergencia, bombas de incendio, etc.)

1. Equipo de combustión: **PS BSG-3** Caterpillar C13 Emergency Diesel Generator (Tipo) ______ (BTU/hr) 609 Hp (HP)

2. Combustible:

Tipo	Gal/hr ó Lb/hr		% azufre
Distillate Oil	28.4 gal/Hr		.0015 wt%

3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso
N/A	N/A

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
9.4 pies	5" pulg.	1059 °F	104.5 pies/seg.

III. EMISIONES POR INCINERACIÓN O DISPOSICIÓN DE DESPERDICIOS: (Sólidos, líquidos, gaseosos)

1. Método para disponer los desperdicios: N/A.
2. Tipo de desperdicios: ______ Cantidad: ______ Lb/día.
3. Incinerador: ______ Tipo ______ Marca ______ Capacidad (Lb/día).
4. Chimenea: ______ Pies (Altura) ______ Pies (Diámetro Salida) ______ °F (Temp. Salida) ______ Pies/seg. (Velocidad Salida)
5. Combustible auxiliar: Tipo ______ Gal/hr ó Lb/hr ______ % azufre ______
6. Equipo de control: ______ Tipo ______ % por peso. Eficiencia

IV. CUMPLIMIENTO: Incluya datos o información demostrando que las emisiones no exceden los límites establecidos.
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Número de Licencia	Nombre (Letra de molde)	Firma

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1. Descripción del proceso u operación que emite contaminantes atmosféricos:
N/A

2. Materia prima usada o procesada: ______ Tipo ______ Cantidad ______ (unidad/unidad tiempo)

3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
pies	pulg.	°F	pies/seg.
pies	pulg.	°F	pies/seg.

5. Volumen de descarga de emisiones: ______ Pies^3/min.
6. Emisiones actuales: Estimado basado en: ______.

Tipo de contaminante	Cantidad (masa/tiempo)	Duración (tiempo/unidad tiempo)

7. Incluya un diagrama de flujo del proceso (tipo bloque) demostrando puntos, cantidades y tipos de emisiones.

II. EMISIONES POR COMBUSTIÓN: (Calderas, calentadores, plantas de emergencia, bombas de incendio, etc.)

1. Equipo de combustión: **PS MP-1** PWPS Model FT-8 MOBILEPAC Combustion Turbine: 294.8 MMBtu/Hr (Nat.Gas); 283.3 MMBtu/Hr Fuel Oil ó ______
Tipo BTU/hr HP

2. Combustible:

Tipo	Gal/hr	ó Lb/hr	% azufre
Gas Natural	289.029 Scf/Hr		5.0 gr/100 dscf
Distillate Oil	2.053 gal/Hr		.05 wt%

3. Equipo de control para emisiones:
4. Chimeneas:

Tipo	Eficiencia % por peso	Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
Water Injection (Gas)	85	33.9 pies	120.95" x 97.08" pulg.	794 °F	157.4 pies/seg.
Water Injection (Oil)	85	33.9 pies	120.95" x 97.08" pulg.	794 °F	155.4 pies/seg.

III. EMISIONES POR INCINERACIÓN O DISPOCISIÓN DE DESPERDICIOS: (Sólidos, líquidos, gaseosos)

1. Método para disponer los desperdicios: N/A.
2. Tipo de desperdicios: ______ Cantidad: ______ Lb/día.
3. Incinerador: ______ Tipo ______ Marca ______ Capacidad (Lb/día).
4. Chimenea: ______ Pies (Altura) ______ Pies (Diámetro Salida) ______ °F (Temp. Salida) ______ Pies/seg. (Velocidad Salida)
5. Combustible auxiliar: Tipo ______ Gal/hr ó Lb/hr ______ % azufre ______
6. Equipo de control: ______ Tipo ______ Eficiencia % por peso.

IV. CUMPLIMIENTO: Incluya datos o información demostrando que las emisiones no exceden los límites establecidos.
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Nombre (Letra de molde)

EFRAN PAREDES MAISONET INGENIERO LICENCIADO LIC. #17776 PUERTO RICO

Firma

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1. Descripción del proceso u operación que emite contaminantes atmosféricos:
   N/A
2. Materia prima usada o procesada: ____ Tipo ____ Cantidad ____ (unidad/unidad tiempo)
3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
pies	pulg.	°F	pies/seg.
pies	pulg.	°F	pies/seg.

5. Volumen de descarga de emisiones: ____ Pies^3/min.
6. Emisiones actuales: Estimado basado en: ____.

Tipo de contaminante	Cantidad (masa/tiempo)	Duración (tiempo/unidad tiempo)

7. Incluya un diagrama de flujo del proceso (tipo bloque) demostrando puntos, cantidades y tipos de emisiones.

II. EMISIONES POR COMBUSTIÓN: (Calderas, calentadores, plantas de emergencia, bombas de incendio, etc.)

1. Equipo de combustión: **PS MP-2** PWPS Model FT-8 MOBILEPAC Combustion Turbine: 294.8 MMBtu/Hr (Nat.Gas); 283.3 MMBtu/Hr Fuel Oil ó ____
   Tipo — BTU/hr — HP
2. Combustible:

Tipo	Gal/hr	ó Lb/hr	% azufre
Gas Natural	289.029 Scf/Hr		5.0 gr/100 dscf
Distillate Oil	2.053 gal/Hr		.05 wt%

3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso
Water Injection (Gas)	85
Water Injection (Oil)	85

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
33.9 pies	120.95" x 97.08" pulg.	794 °F	157.4 pies/seg.
33.9 pies	120.95" x 97.08" pulg.	794 °F	155.4 pies/seg.

III. EMISIONES POR INCINERACIÓN O DISPOCISIÓN DE DESPERDICIOS: (Sólidos, líquidos, gaseosos)

1. Método para disponer los desperdicios: N/A.
2. Tipo de desperdicios: ____ Cantidad: ____ Lb/día.
3. Incinerador: ____ Tipo ____ Marca ____ Capacidad (Lb/día).
4. Chimenea: ____ Pies (Altura) ____ Pies (Diámetro Salida) ____ °F (Temp. Salida) ____ Pies/seg. (Velocidad Salida)
5. Combustible auxiliar: Tipo — Gal/hr ó Lb/hr — % azufre
6. Equipo de control: ____ Tipo ____ Eficiencia % por peso.

IV. CUMPLIMIENTO: Incluya datos o información demostrando que las emisiones no exceden los límites establecidos.
V. EQUIPO DE CONTROL: Incluya esquema de la instalación del equipo de control de la fuente de emisión.

CERTIFICACIÓN DE UN INGENIERO, QUÍMICO O ARQUITECTO LICENCIADO

Certifico que estoy registrado y autorizado para practicar mi profesión en Puerto Rico; que el equipo y medidas para el control de emisiones son adecuadas y cumplen con las disposiciones del Reglamento de Control de Contaminantes Atmosféricos de la Junta de Calidad Ambiental de Puerto Rico y que, de acuerdo a mis mejores conocimientos y creencias, la información suministrada es veraz, completa y exacta.

17776-PE — Número de Licencia
Ing. Efran Paredes Maisonet — Nombre (Letra de molde)
Firma

EFRAN PAREDES MAISONET INGENIERO LICENCIADO LIC. #17776 PUERTO RICO

Fecha: ____ Número de solicitud: ____.

GOBIERNO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

PUERTO RICO VERDE

Área de Calidad de Aire

SOLICITUD DE PERMISO PARA LA CONSTRUCCIÓN U OPERACIÓN DE FUENTES DE EMISIÓN EN PUERTO RICO

PARTE II - PROCESO DE LA PLANTA Y DESCRIPCIÓN DE EMISIONES

I. EMISIONES INDUSTRIALES: (Movimiento de terreno, almacenaje en tanques, talleres de pintado, etc.)

1. Descripción del proceso u operación que emite contaminantes atmosféricos:
   N/A
2. Materia prima usada o procesada: ________ Tipo ________ Cantidad ________ (unidad/unidad tiempo)

3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
pies	pulg.	°F	pies/seg.
pies	pulg.	°F	pies/seg.

5. Volumen de descarga de emisiones: ________ Pies^3/min.
6. Emisiones actuales: Estimado basado en: ________.

Tipo de contaminante	Cantidad (masa/tiempo)	Duración (tiempo/unidad tiempo)

7. Incluya un diagrama de flujo del proceso (tipo bloque) demostrando puntos, cantidades y tipos de emisiones.

II. EMISIONES POR COMBUSTIÓN: (Calderas, calentadores, plantas de emergencia, bombas de incendio, etc.)

1. Equipo de combustión: **PS MP-3** PWPS Model FT-8 MOBILEPAC Combustion Turbine: 294.8 MMBtu/Hr (Nat.Gas); 283.3 MMBtu/Hr Fuel Oil ó ____
   Tipo BTU/hr HP
2. Combustible:

Tipo	Gal/hr ó Lb/hr	% azufre
Gas Natural	289,029 Scf/Hr	5.0 gr/100 dscf
Distillate Oil	2,053 gal/Hr	.05 wt%

3. Equipo de control para emisiones: / 4. Chimeneas:

Tipo	Eficiencia % por peso	Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
Water Injection (Gas)	85	33.9 pies	120.95" x 97.08" pulg.	794 °F	157.4 pies/seg.
Water Injection (Oil)	85	33.9 pies	120.95" x 97.08" pulg.	794 °F	155.4 pies/seg.

III. EMISIONES POR INCINERACIÓN O DISPOCISIÓN DE DESPERDICIOS: (Sólidos, líquidos, gaseosos)

1. Método para disponer los desperdicios: N/A.
2. Tipo de desperdicios: ________ Cantidad: ________ Lb/día.
3. Incinerador: ________ Tipo ________ Marca ________ Capacidad (Lb/día).
4. Chimenea: ________ Pies (Altura) ________ Pies (Diámetro Salida) ________ °F (Temp. Salida) ________ Pies/seg. (Velocidad Salida)
5. Combustible auxiliar: Tipo ________ Gal/hr ó Lb/hr ________ % azufre ________
6. Equipo de control: ________ Tipo ________ % por peso. Eficiencia

IV. CUMPLIMIENTO: Incluya datos o información demostrando que las emisiones no exceden los límites establecidos.
V. EQUIPO DE CONTROL: Incluya esquema de la instalación del equipo de control de la fuente de emisión.

CERTIFICACIÓN DE UN INGENIERO, QUÍMICO O ARQUITECTO LICENCIADO

Certifico que estoy registrado y autorizado para practicar mi profesión en Puerto Rico; que el equipo y medidas para el control de emisiones son adecuadas y cumplen con las disposiciones del Reglamento de Control de Contaminantes Atmosféricos de la Junta de Calidad Ambiental de Puerto Rico y que, de acuerdo a mis mejores conocimientos y creencias, la información suministrada es veraz, completa y exacta.

17776-PE	Ing. Efran Paredes Maisonet	
Número de Licencia	Nombre (Letra de molde)	Firma

EFRAN PAREDES MAISONET
INGENIERO LICENCIADO
LIC. #17776
PUERTO RICO

Fecha: ________. Número de solicitud: ________.

PREPA Palo Seco Mobilepacks and Emergency Generators Stack Parameters

						Stack Dimmenssions			Gas Exit Velocity		Gas Flow Rate		Gas Exit Temperature
Facility	Unit	Stack	Latitude	Longitude	Num. Stacks	Internal L (ft)	Internal W (ft)	Stack Height (ft)	Flue Gas Velocity (ft/s) Natural Gas	Flue Gas Velocity (ft/s) Fuel Oil	w (cfm) Natural	Flow (cfm) Fuel Oil	Flue Gas Temp - degF
Palo Seco	PS MP-1	PS MP 1-1	18.454599	-66.148768	1	10.08	8.1	33.89	157.4	155.4	468,471	462,519	794
Palo Seco	PS MP-2	PS MP 2-1	18.454609	-66.149196	1	10.08	8.1	33.89	157.4	155.4	468,471	462,519	794
Palo Seco	PS MP-3	PS MP 3-1	18.454417	-66.148825	1	10.08	8.1	33.89	157.4	155.4	468,471	462,519	794
Palo Seco	PS BSG-1	PS BSG 1-1	18.454892	-66.149352	1	0.42	N/A Diam.	9.40	N/A	104.5	N/A	855	1059
Palo Seco	PS BSG-2	PS BSG 2-1	18.454907	-66.149346	1	0.42	N/A Diam.	9.40	N/A	104.5	N/A	855	1059
Palo Seco	PS BSG-3	PS BSG 3-1	18.454861	-66.149335	1	0.42	N/A Diam.	9.40	N/A	104.5	N/A	855	1059

PREPA notes:

* Parameters, as shown on table, correspond to design data for such units.

Palo Seco Combustion Turbinie Project Potential Emissions Versus PSD Significance Thresholds

Pollutant	Combustion Turbine Potential (tpy)	BSGs Potential (tpy)	Natural Gas Handling Potential (tpy)	Project Total Potential (tpy)	PSD Significance Threshold (tpy)
NO_x	191.34	4.922	0	196.3	40
PM	19.57	0.109	0	19.7	25
PM_{10}	19.57	0.131	0	19.7	15
$PM_{2.5}$	19.57	0.131	0	19.7	10
CO	99.45	2.292	0	101.7	100
VOC	7.85	0.136	0.55	8.54	40
SO_2	55.82	0.004	0	55.8	40
H_2SO_4	8.55	0.001	0	8.55	7
GHGs (as CO2e)	180,889	481	124	181,494	75,000

Future Potential Emissions - Palo Seco Power Plant														
Pollutant	Emissions From PSGT 1-1, 1-2, and 2-1			Emissions From New FT8 Combustion Turbines				Emissions From New FT8 Combustion Turbines	Emissions From New BSGs	Emissions From Units 1-4			Emergency Engines	Total Power Plant Emissions
	AP-42 04/00 - GT Fuel Oil Table 3.1-4 for Organics Fuel Sample Metals			Vendor Specs Criteria Pollutants. AP-42 04/00 - Oil Table 3.1-4 for Organic HAPs. Fuel Sample Metal HAPs		Vendor Specs Criteria Pollutants. AP-42 04/00 - Gas Table 3.1-3 for Organic HAPs.				AP-42 09/98 - No. 6 Oil Combustion Table 1.3-9 and 1.3-11 No. 6 Fuel Oil Sample for Metals				
	ppm	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	ton/yr	ton/yr	ppm	lb/MMBtu	ton/yr	ton/yr	(ton/yr)
NOx		8.8E-01	3,486.3	1.73E-01	191.3	1.10E-01	142.6	191.34	4.92		0.2133	3,811.6	9.85	7,499.1
CO		3.3E-03	13.1	3.43E-02	37.9	7.67E-02	99.5	99.45	2.29		0.0333	595.6	3.06	711.2
VOC		4.1E-04	1.6	7.10E-03	7.85	5.13E-03	6.7	7.85	0.14		0.0051	90.5	0.55	100.6
PM		0.012	47.5	0.0177	19.6	0.010	13.2	19.57	0.13		0.0521	930.9	0.24	998.2
PM10		0.012	47.5	0.0177	19.6	0.010	13.2	19.57	0.13		0.0470	839.6	0.23	907.0
PM2.5		0.012	47.5	0.0177	19.6	0.010	13.2	19.57	0.13		0.0470	839.6	0.23	907.0
SO2		5.05E-01	2,000.7	5.05E-02	55.82	1.40E-03	1.8	55.82	0.004		0.5423	9,689.9	1.32	11,747.7
H2SO4		7.73E-02	306.4	7.73E-03	8.55	2.14E-04	0.3	8.55	0.001		8.30E-02	1,483.8	0.20	1,798.9
GHGs as CO2e		163.64	648,300	163.64	180,889	117.12	151,864	180,889	481.0		1.66E+02	2,968,700	584	3,798,472
1,1,1-Trichloroethane											1.57E-06	2.81E-02		2.81E-02
1,3-Butadiene		1.60E-05	6.34E-02	1.60E-05	1.77E-02	4.30E-07	5.58E-04	1.77E-02					3.77E-05	8.11E-02
Acenaphthene									1.38E-05		1.41E-07	2.51E-03	1.35E-05	2.53E-03
Acenaphthylene									2.71E-05		1.69E-09	3.01E-05	2.89E-05	5.91E-05
Acetaldehyde						4.00E-05	5.19E-02	5.19E-02	7.41E-05				8.13E-04	5.27E-02
Acrolein						6.40E-06	8.30E-03	8.30E-03	2.32E-05				1.10E-04	8.41E-03
Anthracene									3.62E-06		8.13E-09	1.45E-04	5.03E-06	1.50E-04
Benzo(a)anthracene									1.83E-06		2.67E-08	4.78E-04	3.26E-06	4.81E-04
Benzene		5.50E-05	2.18E-01	5.50E-05	6.08E-02	1.20E-05	1.56E-02	6.08E-02	2.28E-03		1.43E-06	2.55E-02	2.92E-03	3.07E-01
Benzo(a)pyrene									7.55E-07				6.69E-07	6.69E-07
Benzo(b)fluoranthene									3.26E-06				2.89E-06	2.89E-06
Benzo(b,k)fluoranthene											9.87E-09	1.76E-04	1.64E-07	1.76E-04
Benzo(g,h,i)perylene									1.63E-06		1.51E-08	2.69E-04	1.92E-06	2.71E-04
Benzo(k)fluoranthene									6.41E-07				5.67E-07	5.67E-07
Chrysene									4.50E-06		1.59E-08	2.83E-04	4.32E-06	2.88E-04
D benzo(a,h)anthracene									1.02E-06		1.11E-08	1.99E-04	1.46E-06	2.00E-04
Ethylbenzene						3.20E-05	4.15E-02	4.15E-02			4.24E-07	7.58E-03		4.91E-02
Fluoranthene									1.18E-05		3.23E-08	5.77E-04	1.78E-05	5.94E-04
Fluorene									3.76E-05		2.98E-08	5.32E-04	6.13E-05	5.94E-04
Formaldehyde		2.31E-04	9.15E-01	2.31E-04	2.55E-01	2.19E-04	2.84E-01	2.84E-01	2.32E-04		2.20E-04	3.93E+00	1.36E-03	5.13E+00
Indeno(1,2,3-cd)pyrene									1.22E-06		1.43E-08	2.55E-04	1.44E-06	2.56E-04
Naphtalene		3.50E-05	1.39E-01	3.50E-05	3.87E-02	1.30E-06	1.69E-03	3.87E-02						1.77E-01
Total PAHs		4.00E-05	1.58E-01	4.00E-05	4.42E-02	2.20E-06	2.85E-03	4.42E-02	3.82E-04		8.67E-06	1.55E-01	5.02E-04	3.58E-01
OCDD											2.07E-11	3.69E-07		3.69E-07
Phenanathrene									1.20E-04		7.00E-08	1.25E-03	1.34E-04	1.38E-03
Propylene														
Pyrene									1.09E-05		2.83E-08	5.06E-04	1.43E-05	5.21E-04
Toluene						1.30E-04	1.69E-01	1.69E-01	8.26E-04		4.13E-05	7.39E-01	1.13E-03	9.08E-01
Xylene						6.40E-05	8.30E-02	8.30E-02	5.67E-04		7.27E-07	1.30E-02	7.82E-04	9.68E-02
Arsenic	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01

Future Potential Emissions - Palo Seco Power Plant														
Pollutant	Emissions From PSGT 1-1, 1-2, and 2-1			Emissions From New FT8 Combustion Turbines				Emissions From New FT8 Combustion Turbines	Emissions From New BSGs	Emissions From Units 1-4			Emergency Engines	Total Power Plant Emissions
	AP-42 04/00 - GT Fuel Oil Table 3.1-4 for Organics Fuel Sample Metals			Vendor Specs Criteria Pollutants. AP-42 04/00 - Oil Table 3.1-4 for Organic HAPs. Fuel Sample Metal HAPs		Vendor Specs Criteria Pollutants. AP-42 04/00 - Gas Table 3.1-3 for Organic HAPs.				AP-42 09/98 - No. 6 Oil Combustion Table 1.3-9 and 1.3-11 No. 6 Fuel Oil Sample for Metals				
	ppm	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	ton/yr	ton/yr	ppm	lb/MMBtu	ton/yr	ton/yr	(ton/yr)
Antimony	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01
Beryllium	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	0.05	2.69E-06	4.80E-02	8.80E-06	6.05E-02
Cadmium	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	0.05	2.69E-06	4.80E-02	8.80E-06	6.05E-02
Chromium	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	4.00	2.15E-04	3.84E+00	8.80E-06	3.85E+00
Cobalt	0.10	4.93E-06	1.96E-02	4.93E-06	5.45E-03			5.45E-03	1.45E-05	0.30	1.61E-05	2.88E-01	1.76E-05	3.13E-01
Lead	0.20	9.87E-06	3.91E-02	9.87E-06	1.09E-02			1.09E-02	2.90E-05	5.00	2.69E-04	4.80E+00	3.52E-05	4.85E+00
Manganese	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	0.05	2.69E-06	4.80E-02	8.80E-06	6.05E-02
Mercury	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01
Nickel	0.10	4.93E-06	1.96E-02	4.93E-06	5.45E-03			5.45E-03	1.45E-05	10.8	5.80E-04	1.04E+01	1.76E-05	1.04E+01
Selenium	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01
Total HAPs		**4.70E-04**	**1.86**	**4.70E-04**	**0.52**	**5.06E-04**	**0.66**	**0.66**	**0.66**		**1.47E-03**	**26.27**		**28.79**
Maximum Individual HAP												**Nickel**		**10.39**

Fuel Type	Heat Content		Density lb/gal	Annual Firing Rate			
Distillate Oil (New GTs)	**138,000**	**Btu/gal**	**6.81**	**16,020,227**	**gal/yr**	**2,210,791**	**MMBtu/yr**
Natural Gas (New GTs)	**1,020**	**Btu/cf**	**N/A**	**2,542**	**MMCF/yr**	**2,593,341**	**MMBtu/yr**
Distillate Oil (Existing GTs	**138,000**	**Btu/gal**	**6.81**	**57,416,087**	**gal/yr**	**7,923,420**	**MMBtu/yr**
No. 6 Fuel Oil (Boilers)	**150,000**	**Btu/gal**	**8.06**	**238,227,149**	**gal/yr**	**35,734,072**	**MMBtu/yr**
Fuel Sulfur (new GTs)		**0.05**	**%**				
Fuel Sulfur (existing GTs)		**0.50**	**%**				
Fuel Sulfur (Boilers)		**0.50**	**%**				

Notes:

1) If results of fuel oil testing indicated that the concentration of a particular metal is below detectable limits, the metal concentration was set to one-half the lowest detectable level.
2) The facility-wide HAP potential emissions is based upon the maximum result by individual HAP and total HAPs for fuel oil and natural gas.
3) For distillate oil firing, PTE based upon existing permit limits, rated firing rate, and 8,760 hr/yr, as applicable.
4) For natural gas firing, PTE based upon vendor emission guarantee rated firing rate, and 8,760 hr/yr, as applicable
5) For natural gas firing, VOC and PM/PM10/PM2.5 emissions based on AP-42, Section 3.1, Table 3.1-1.
6) For natural gas firing, formaldehyde (HCOH) PTE based on vendor guarantee (91 ppbvd).
7) SO2 emissions based upon fuel sulfur content limits
8) HAP PTE, except for HCOH on gas for new CTGs, based on AP-42 Section 3.1, Tables 3.1-1, 3.1-3, 3.1-4, and 3.1-5.
9) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
10) CO2e emissions from 40 CFR 98, Subchapter C, Tables 1 and 2
11) Natural gas and distillate oil throughput limited to keep emissions below PSD signficance threshold.
12) Boilers 1 and 2 potential emissions based upon 8% annual capacity factor for limited use oil units under 40 CFR 63, Subpart UUUUU.

13) Fuel Oil F factor	9190	dsf/MMBtu
14) Natural Gas F factor	8710	dsf/MMBtu
15) From Method 19 - NOx	1.194E-07	lb/scf:ppm

Future Potential Emissions - Palo Seco Power Plant														
Pollutant	Emissions From PSGT 1-1, 1-2, and 2-1			Emissions From New FT8 Combustion Turbines				Emissions From New FT8 Combustion Turbines	Emissions From New BSGs	Emissions From Units 1-4			Emergency Engines	Total Power Plant Emissions
	AP-42 04/00 - GT Fuel Oil Table 3.1-4 for Organics Fuel Sample Metals			Vendor Specs Criteria Pollutants. AP-42 04/00 - Oil Table 3.1-4 for Organic HAPs. Fuel Sample Metal HAPs		Vendor Specs Criteria Pollutants. AP-42 04/00 - Gas Table 3.1-3 for Organic HAPs.				AP-42 09/98 - No. 6 Oil Combustion Table 1.3-9 and 1.3-11 No. 6 Fuel Oil Sample for Metals				
	ppm	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	ton/yr	ton/yr	ppm	lb/MMBtu	ton/yr	ton/yr	(ton/yr)
16) From Method 19 - CO		7.270E-08	lb/scf:ppm											
Rated Fuel Firing Rates FT8														
Fuel Type	**MMBtu/hr**													
Distillate Oil	283.3	24-hr average												
Natural Gas	294.8	24-hr average												
1 b = 7000 grains														

Potential Emissions - Palo Seco Power Plant Black Start Engines

Pollutant	Emissions From BSG-PS-1 609 hp		Emissions From BSG-PS-2 609 hp		Emissions From BSG-PS-3 609 hp		Totals
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.675	1.641	1.675	1.641	1.675	1.641	4.922
CO	0.780	0.764	0.780	0.764	0.780	0.764	2.292
VOC	0.046	0.045	0.046	0.045	0.046	0.045	0.136
PM (filterable only)	0.0370	0.036	0.0370	0.036	0.0370	0.036	0.109
PM10	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
PM2.5	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
SO2	0.0015	0.001	0.0015	0.001	0.0015	0.001	0.004
H2SO4	0.0002	0.000	0.0002	0.000	0.0002	0.000	0.001
CO2e	163.64	160.3	163.64	160.3	163.64	160.3	481.0
1,1,1-Trichloroethane							
1,1-Dichloroethane							
1,2-Dichloroethane							
1,1,2,2,-Tetrachloroethane							
1,1,2-Trichloroethane							
1,3-Butadiene							
1,3-Dichloropropene							
Trimethylbenzenes							
2,2,4-Trimethylpentane							
Acenaphthene	4.68E-06	4.59E-06	4.68E-06	4.59E-06	4.68E-06	4.59E-06	1.38E-05
Acenaphthylene	9.23E-06	9.04E-06	9.23E-06	9.04E-06	9.23E-06	9.04E-06	2.71E-05
Acetaldehyde	2.52E-05	2.47E-05	2.52E-05	2.47E-05	2.52E-05	2.47E-05	7.41E-05
Acrolein	7.88E-06	7.72E-06	7.88E-06	7.72E-06	7.88E-06	7.72E-06	2.32E-05
Anthracene	1.23E-06	1.21E-06	1.23E-06	1.21E-06	1.23E-06	1.21E-06	3.62E-06
Benzo(a)anthracene	6.22E-07	6.09E-07	6.22E-07	6.09E-07	6.22E-07	6.09E-07	1.83E-06
Benzene	7.76E-04	7.60E-04	7.76E-04	7.60E-04	7.76E-04	7.60E-04	2.28E-03
Benzo(a)pyrene	2.57E-07	2.52E-07	2.57E-07	2.52E-07	2.57E-07	2.52E-07	7.55E-07
Benzo(b)fluoranthene	1.11E-06	1.09E-06	1.11E-06	1.09E-06	1.11E-06	1.09E-06	3.26E-06
Benzo(b,k)fluoranthene							
Benzo(e)pyrene							
Benzo(g,h,i)perylene	5.56E-07	5.45E-07	5.56E-07	5.45E-07	5.56E-07	5.45E-07	1.63E-06
Benzo(k)fluoranthene	2.18E-07	2.14E-07	2.18E-07	2.14E-07	2.18E-07	2.14E-07	6.41E-07
Biphenyl							
Carbon Tetrachloride							
Chlorobenzene							
Chloroform							
Chrysene	1.53E-06	1.50E-06	1.53E-06	1.50E-06	1.53E-06	1.50E-06	4.50E-06
Cyclohexane							
Dibenzo(a,h)anthracene	3.46E-07	3.39E-07	3.46E-07	3.39E-07	3.46E-07	3.39E-07	1.02E-06
Ethylbenzene							
Fluoranthene	4.03E-06	3.95E-06	4.03E-06	3.95E-06	4.03E-06	3.95E-06	1.18E-05
Fluorene	1.28E-05	1.25E-05	1.28E-05	1.25E-05	1.28E-05	1.25E-05	3.76E-05
Formaldehyde	7.89E-05	7.73E-05	7.89E-05	7.73E-05	7.89E-05	7.73E-05	2.32E-04
Indeno(1,2,3-cd)pyrene	4.14E-07	4.06E-07	4.14E-07	4.06E-07	4.14E-07	4.06E-07	1.22E-06
Methanol							
Methyl chloride							
Total PAHs	1.30E-04	1.27E-04	1.30E-04	1.27E-04	1.30E-04	1.27E-04	3.82E-04

Potential Emissions - Palo Seco Power Plant Black Start Engines

Pollutant	Emissions From BSG-PS-1 609 hp		Emissions From BSG-PS-2 609 hp		Emissions From BSG-PS-3 609 hp		Totals
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.675	1.641	1.675	1.641	1.675	1.641	4.922
CO	0.780	0.764	0.780	0.764	0.780	0.764	2.292
VOC	0.046	0.045	0.046	0.045	0.046	0.045	0.136
PM (filterable only)	0.0370	0.036	0.0370	0.036	0.0370	0.036	0.109
PM10	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
PM2.5	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
SO2	0.0015	0.001	0.0015	0.001	0.0015	0.001	0.004
H2SO4	0.0002	0.000	0.0002	0.000	0.0002	0.000	0.001
CO2e	163.64	160.3	163.64	160.3	163.64	160.3	481.0
n-Hexane							
OCDD							
Perylene							
Phenanathrene	4.08E-05	4.00E-05	4.08E-05	4.00E-05	4.08E-05	4.00E-05	1.20E-04
Phenol							
Pyrene	3.71E-06	3.64E-06	3.71E-06	3.64E-06	3.71E-06	3.64E-06	1.09E-05
Styrene							
Toluene	2.81E-04	2.75E-04	2.81E-04	2.75E-04	2.81E-04	2.75E-04	8.26E-04
Vinyl Chloride							
Xylene	1.93E-04	1.89E-04	1.93E-04	1.89E-04	1.93E-04	1.89E-04	5.67E-04
Arsenic	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Antimony	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Beryllium	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Cadmium	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Chromium	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Cobalt	4.93E-06	4.84E-06	4.93E-06	4.84E-06	4.93E-06	4.84E-06	1.45E-05
Lead	9.87E-06	9.67E-06	9.87E-06	9.67E-06	9.87E-06	9.67E-06	2.90E-05
Manganese	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Mercury	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Nickel	4.93E-06	4.84E-06	4.93E-06	4.84E-06	4.93E-06	4.84E-06	1.45E-05
Selenium	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Total HAPs	**1.70E-03**	**1.67E-03**	**1.70E-03**	**1.67E-03**	**1.70E-03**	**1.67E-03**	**5.00E-03**

Engine firing rate	**28.4**	**gal/hr**	**28.4**	**gal/hr**	**28.4**	**gal/hr**
Engine firing rate	**3.92**	**MMBtu/hr**	**3.92**	**MMBtu/hr**	**3.92**	**MMBtu/hr**
Engine operating hours	**500**	**hr/yr**	**500**	**hr/yr**	**500**	**hr/yr**
Engine annual heat input	**1,960**	**MMBtu/yr**	**1,960**	**MMBtu/yr**	**1,960**	**MMBtu/yr**
Fuel Sulfur	**0.0015**	**%**	**0.0015**	**%**	**0.0015**	**%**

Notes:
1) Organic HAP emissions from AP-42 Section 3.4, Tables 3.4-3 and 3.4-4. Metal HAP emissions from fuel samples
2) NOx, CO, PM (filterable), and VOC (as HC) emissions are from Caterpillar performance specifications
3) PM10/PM2.5 condensable from AP-42, Table 3.4-2
4) SO2 emissions from mass balance and fuel sulfur content
5) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4

Potential Emissions - Palo Seco Power Plant Black Start Engines

Pollutant	Emissions From BSG-PS-1		Emissions From BSG-PS-2		Emissions From BSG-PS-3		Totals
	609 hp		609 hp		609 hp		
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.675	1.641	1.675	1.641	1.675	1.641	4.922
CO	0.780	0.764	0.780	0.764	0.780	0.764	2.292
VOC	0.046	0.045	0.046	0.045	0.046	0.045	0.136
PM (filterable only)	0.0370	0.036	0.0370	0.036	0.0370	0.036	0.109
PM10	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
PM2.5	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
SO2	0.0015	0.001	0.0015	0.001	0.0015	0.001	0.004
H2SO4	0.0002	0.000	0.0002	0.000	0.0002	0.000	0.001
CO2e	163.64	160.3	163.64	160.3	163.64	160.3	481.0

6) CO2e emissions from 40 CFR 98, Subchapter C, Tables 1 and 2 and GWPs in 40 CFR 98, Subchapter A, Table

Potential Emissions - Palo Seco Power Plant Emergency Engines

Pollutant	Emissions From GE-GIS-PS-1		Emissions From B1-PS-1		Emissions From GE-PS-1		Emissions From GE-PS-2		Totals
	385 hp		208 hp		765 hp		765 hp		
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.048	0.64	2.492	0.89	3.2	4.16	3.2	4.16	9.85E+00
CO	0.909	0.55	0.831	0.30	0.85	1.11	0.85	1.11	3.06E+00
VOC	0.35	0.21	0.35	0.13	0.0819	0.11	0.0819	0.11	5.51E-01
PM	0.0524	0.03	0.1278	0.05	0.062	0.08	0.062	0.08	2.39E-01
PM10	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
PM2.5	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
SO2	0.0015	0.00	0.0015	0.00	0.5050	0.66	0.5050	0.66	1.32E+00
H2SO4	2.30E-04	1.39E-04	2.30E-04	8.24E-05	7.73E-02	1.01E-01	7.73E-02	1.01E-01	2.01E-01
CO2e	1.64E+02	9.94E+01	1.64E+02	5.87E+01	1.64E+02	2.13E+02	1.64E+02	2.13E+02	5.84E+02
1,1,1-Trichloroethane									
1,1-Dichloroethane									
1,2-Dichloroethane									
1,1,2,2,-Tetrachloroethane									
1,1,2-Trichloroethane									
1,3-Butadiene	3.90E-05	2.37E-05	3.90E-05	1.40E-05					3.77E-05
1,3-Dichloropropene									
Trimethylbenzenes									
2,2,4-Trimethylpentane									
Acenaphthene	1.40E-06	8.50E-07	1.40E-06	5.02E-07	4.68E-06	6.09E-06	4.68E-06	6.09E-06	1.35E-05
Acenaphthylene	5.10E-06	3.10E-06	5.10E-06	1.83E-06	9.23E-06	1.20E-05	9.23E-06	1.20E-05	2.89E-05
Acetaldehyde	7.74E-04	4.70E-04	7.74E-04	2.78E-04	2.52E-05	3.28E-05	2.52E-05	3.28E-05	8.13E-04
Acrolein	9.30E-05	5.65E-05	9.30E-05	3.34E-05	7.88E-06	1.02E-05	7.88E-06	1.02E-05	1.10E-04
Anthracene	1.90E-06	1.15E-06	1.90E-06	6.82E-07	1.23E-06	1.60E-06	1.23E-06	1.60E-06	5.03E-06
Benzo(a)anthracene	1.70E-06	1.03E-06	1.70E-06	6.10E-07	6.22E-07	8.09E-07	6.22E-07	8.09E-07	3.26E-06
Benzene	9.30E-04	5.65E-04	9.30E-04	3.34E-04	7.76E-04	1.01E-03	7.76E-04	1.01E-03	2.92E-03
Benzo(a)pyrene					2.57E-07	3.34E-07	2.57E-07	3.34E-07	6.69E-07
Benzo(b)fluoranthene					1.11E-06	1.44E-06	1.11E-06	1.44E-06	2.89E-06
Benzo(b,k)fluoranthene	1.70E-07	1.03E-07	1.70E-07	6.10E-08					1.64E-07
Benzo(e)pyrene									
Benzo(g,h,i)perylene	4.90E-07	2.98E-07	4.90E-07	1.76E-07	5.56E-07	7.23E-07	5.56E-07	7.23E-07	1.92E-06
Benzo(k)fluoranthene					2.18E-07	2.84E-07	2.18E-07	2.84E-07	5.67E-07
Biphenyl									
Carbon Tetrachloride									
Chlorobenzene									
Chloroform									
Chrysene	3.50E-07	2.13E-07	3.50E-07	1.26E-07	1.53E-06	1.99E-06	1.53E-06	1.99E-06	4.32E-06
Cyclohexane									
Dibenzo(a,h)anthracene	5.80E-07	3.52E-07	5.80E-07	2.08E-07	3.46E-07	4.50E-07	3.46E-07	4.50E-07	1.46E-06
Ethylbenzene									
Fluoranthene	7.60E-06	4.61E-06	7.60E-06	2.73E-06	4.03E-06	5.24E-06	4.03E-06	5.24E-06	1.78E-05
Fluorene	2.90E-05	1.76E-05	2.90E-05	1.04E-05	1.28E-05	1.66E-05	1.28E-05	1.66E-05	6.13E-05
Formaldehyde	1.20E-03	7.29E-04	1.20E-03	4.31E-04	7.89E-05	1.03E-04	7.89E-05	1.03E-04	1.36E-03
Indeno(1,2,3-cd)pyrene	3.80E-07	2.31E-07	3.80E-07	1.36E-07	4.14E-07	5.38E-07	4.14E-07	5.38E-07	1.44E-06
Methanol									
Methyl chloride									
Total PAHs	1.70E-04	1.03E-04	1.70E-04	6.10E-05	1.30E-04	1.69E-04	1.30E-04	1.69E-04	5.02E-04
n-Hexane									
OCDD									
Perylene									
Phenanathrene	2.90E-05	1.76E-05	2.90E-05	1.04E-05	4.08E-05	5.31E-05	4.08E-05	5.31E-05	1.34E-04
Phenol									
Pyrene	4.80E-06	2.91E-06	4.80E-06	1.72E-06	3.71E-06	4.83E-06	3.71E-06	4.83E-06	1.43E-05
Styrene									
Toluene	4.10E-04	2.49E-04	4.10E-04	1.47E-04	2.81E-04	3.65E-04	2.81E-04	3.65E-04	1.13E-03
Vinyl Chloride									
Xylene	2.90E-04	1.76E-04	2.90E-04	1.04E-04	1.93E-04	2.51E-04	1.93E-04	2.51E-04	7.82E-04
Arsenic	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05
Antimony	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05
Beryllium	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06

Potential Emissions - Palo Seco Power Plant Emergency Engines

Pollutant	Emissions From GE-GIS-PS-1 385 hp		Emissions From B1-PS-1 208 hp		Emissions From GE-PS-1 765 hp		Emissions From GE-PS-2 765 hp		Totals
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.048	0.64	2.492	0.89	3.2	4.16	3.2	4.16	9.85E+00
CO	0.909	0.55	0.831	0.30	0.85	1.11	0.85	1.11	3.06E+00
VOC	0.35	0.21	0.35	0.13	0.0819	0.11	0.0819	0.11	5.51E-01
PM	0.0524	0.03	0.1278	0.05	0.062	0.08	0.062	0.08	2.39E-01
PM10	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
PM2.5	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
SO2	0.0015	0.00	0.0015	0.00	0.5050	0.66	0.5050	0.66	1.32E+00
H2SO4	2.30E-04	1.39E-04	2.30E-04	8.24E-05	7.73E-02	1.01E-01	7.73E-02	1.01E-01	2.01E-01
CO2e	1.64E+02	9.94E+01	1.64E+02	5.87E+01	1.64E+02	2.13E+02	1.64E+02	2.13E+02	5.84E+02
Cadmium	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06
Chromium	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06
Cobalt	4.93E-06	3.00E-06	4.93E-06	1.77E-06	4.93E-06	6.42E-06	4.93E-06	6.42E-06	1.76E-05
Lead	9.87E-06	5.99E-06	9.87E-06	3.54E-06	9.87E-06	1.28E-05	9.87E-06	1.28E-05	3.52E-05
Manganese	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06
Mercury	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05
Nickel	4.93E-06	3.00E-06	4.93E-06	1.77E-06	4.93E-06	6.42E-06	4.93E-06	6.42E-06	1.76E-05
Selenium	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05
Total HAPs	**4.12E-03**	**2.50E-03**	**4.12E-03**	**1.48E-03**	**1.70E-03**	**2.21E-03**	**1.70E-03**	**2.21E-03**	**8.40E-03**

Engine firing rate	**17.6**	**gal/hr**	**10.4**	**gal/hr**	**37.7**	**gal/hr**	**37.7**	**gal/hr**
Engine operating hours	**500**	**hr/yr**	**500**	**hr/yr**	**500**	**hr/yr**	**500**	**hr/yr**
Engine annual heat input	**1,214**	**MMBtu/yr**	**718**	**MMBtu/yr**	**2,601**	**MMBtu/yr**	**2,601**	**MMBtu/yr**
Fuel Sulfur	**0.0015**	**%**	**0.0015**	**%**	**0.50**	**%**	**0.50**	**%**

Notes:
1) Organic HAP emissions from diesel engines rated <600 hp from AP-42 Section 3.3, Table 3.3-2. Metal HAP emissions from fuel sample
2) Organic HAP emissions from diesel engines rated >600 hp from AP-42 Section 3.4, Tables 3.4-3 and 3.4-4. Metal HAP emissions from fuel samples
3) HAP emisisons from propane engine from AP-42 Section 3.2, Table 3.2-2.
4) NOx, CO, and PM (filterable) emissions are from 40 CFR 60 NSPS Subpart IIII for GE-GIS-PS-1 and B1-PS-1
5) VOC from AP-42 Tables 3.3-1 and 3.4-1
6) SO2 emissions from mass balance and fuel sulfur content
7) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
8) CO2e emissions from 40 CFR 98, Subchapter C, Tables 1 and 2

Potential Emissions - Palo Seco Natural Gas Handling System Fugitive Emissions

Emission Factors	
Source Type	**Gas (kg/hr/source)**
Flanges (Vapor)	0.00039
Flanges (Liquid)	0.00011
Valves (Vapor)	0.0045
Others (compressors, drains, instruments, meters, PSVs, vents) (Vapor)	0.0088

Emission factors are from EPA's "Protocol for Equipment Leak Emissions Estimates" Table 2-4 (November 1995)

Potential Emissions					
Source Type	**Source Type Used**	**Count**	**All Gas (tpy)**	**VOC (tpy)**	**GHG (tpy)**
Flange (Vapor)	Flanges	38	0.143	0.014	3.2
Flange (Liquid)	Flanges	20	0.021	0.002	0.5
Valves (Vapor)	Valves	53	2.303	0.230	51.8
Vents, Drains, PIs, Lis, PSVs (Vapor)	Others	36	3.060	0.306	68.8
TOTALS			**5.53**	**0.55**	**124.4**
LNG estimated to have combined methane and ethane content >95% but emissions conservatively assume a VOC content of 10 percent.					
GHG emissions based upon all non-VOC emissions being methane with a global warmng potential of 25 (see 40 CFR 98, Subpart A, Table A-1)					

$$GHG\left(\frac{ton}{year}\right) = \left[All\ gas\left(\frac{ton}{year}\right) - VOC\left(\frac{ton}{year}\right)\right] X\ 25$$

PERMIT FEE CALCULATION

Pollutant	Tons Per Year			Difference	Fee
	PSGT Per Unit	PSGT 1-1, 1-2, and 2-1	Project		
PM10	15.85	47.54	19.70	-27.84	$0.00
SO2	666.89	2000.66	55.83	-1944.84	$0.00
NOx	1162.10	3486.30	196.27	-3290.04	$0.00
VOC	0.54	1.62	8.54	6.91	$69.12
CO	4.36	13.07	101.75	88.67	$886.73
TOTAL					$955.85

Gobierno de Puerto Rico
Autoridad de Energía Eléctrica

22 de enero de 2020

Honorable Armando Otero Negrón
Secretario, Interino
Departamento de Recursos Naturales
y Ambientales
San Juan Puerto Rico

Estimado señor Secretario:

RE: Solicitud de Dispensa – Emergencia Causada Sismos Enero de 2020

Puerto Rico ha estado experimentando continuos movimientos telúricos de diferentes grados de magnitud. Entre los movimientos de tierra ocurridos recientemente destacamos los eventos ocurridos en la madrugada del 7 de enero de 2020, en los que se registraron dos sismos con una magnitud de 6.4 y 6.0 en la escala Richter, ocurridos a unas 10 millas al sur del Municipio de Guayanilla. Estos eventos han ocasionado daños significativos en la infraestructura, vida y propiedad, incluyendo carreteras, puentes, escuelas, viviendas y otros daños relacionados. Estos sismos impactaron severamente el sistema eléctrico de la Autoridad de Energía Eléctrica de Puerto Rico (Autoridad), lo que ocasionó que todas las unidades generadoras de carga base y turbinas de la Autoridad quedaran fuera de servicio. Esto tuvo el efecto de que los residentes, empresas y otras instalaciones en la Isla se quedaran sin electricidad.

Como consecuencia de lo anterior, el 7 de enero de 2020, la Honorable Wanda Vázquez Garced, Gobernadora de Puerto Rico, emitió la Orden Ejecutiva OE-2020-01 que declara un estado de emergencia debido a la actividad sísmica. Esta declaración de emergencia se realiza con el fin de atender toda amenaza a la vida y los daños causados a la infraestructura y propiedad, por la actividad sísmica. El Presidente de los Estados Unidos de Norteamérica, Donald J. Trump, firmó una declaración de emergencia que permite al Gobierno Federal proveer ayuda al Gobierno de Puerto Rico dirigida a salvar vidas, protegerlas y en favor de la seguridad pública.

Principal Oficial Ejecutivo
Apartado 364267
San Juan, Puerto Rico 00936-4267

787.521.4666
787.521.4665

La Central Costa Sur se encuentra en el área sur de Puerto Rico, cerca del epicentro de estos sismos y sufrió graves daños físicos y estructurales que ocasionaron que quede fuera de servicio. Debido a la continua actividad sísmica que aún se reporta, y a la inestabilidad de la Central Costa Sur en estos momentos, el acceso a la instalación es limitado y restringido. Se estima, preliminarmente, que la Central estará fuera de operaciones por aproximadamente un año. Las unidades afectadas producen aproximadamente el 25% de la generación eléctrica base del país.

Con Costa Sur fuera de servicio, la Autoridad dirige todos los esfuerzos a sus otras unidades disponibles para restablecer el servicio de energía eléctrica al pueblo de Puerto Rico. En este momento la Autoridad tiene el 98% de sus aproximadamente 1.4 millones de clientes con servicio. No obstante, anticipamos que nuestro sistema de generación eléctrica permanecerá inestable hasta que podamos completar la generación necesaria para satisfacer la demanda que requiere el país y tener una reserva adecuada para cualquier otro evento que pueda surgir. Esto trae como consecuencia una inestabilidad en el sistema que requiere que la Autoridad utilice todas sus unidades disponibles.

La salida inesperada de las unidades de Costa Sur agrava la situación por la que ya atravesaba la Autoridad y que ha sido producto de los daños ocasionados por los huracanes Irma y María, ocurridos en septiembre de 2017, y que dejaron el sistema eléctrico en muy mal estado. Como consecuencia de esa situación, la Autoridad ha tenido que requerir de su agencia y de la Agencia Federal de Protección Ambiental (EPA, por sus siglas en inglés) varias dispensas para su operación. En la carta del 10 de enero de 2020, copia de la cual incluimos, le reseñamos las condiciones del sistema de generación eléctrica y su vulnerabilidad. Los sismos ocurridos han trastocado las operaciones de la Autoridad; por lo cual estos eventos constituyen una emergencia, según definida en la Regla 603(e) del Reglamento para el Control de la Contaminación Atmosférica, (RCCA) vigente. Además, según definida en la reglamentación federal aplicable 40 CFR 63.6675, se considera emergencia en fuentes estacionarias como la falta de servicio, servicio intermitente de energía eléctrica de la AEE, servicio con voltaje inestable, de poca calidad, inseguro o que represente riesgo para equipos o personal.

Como resultado de estos eventos y de la emergencia suscitada, anticipamos se pueda causar un disloque en el cumplimiento con los permisos de Fuentes de Emisión, condiciones del *Mercury and Air Toxics Standards* (MATS), el *State Implementation Plan* (SIP) y el Acuerdo por Consentimiento firmado en el 1999 con el Departamento de Justicia Federal y la Agencia de Protección Ambiental, que aún se encuentra vigente.

Por lo anterior, solicitamos que, para garantizar la operación de nuestro sistema eléctrico, nos provea de una dispensa operacional que considere los aspectos que a continuación exponemos:

<u>Programa de Permisos de Fuente de Emisión</u>

La Autoridad cuenta con 10 permisos de fuentes de emisión necesarios para la generación de electricidad a todo el pueblo de Puerto Rico. Esos permisos fueron expedidos por la Junta de Calidad Ambiental, ahora Departamento de Recursos Naturales y Ambientales (DRNA), como parte del programa de operaciones de permisos de fuentes de emisión, cubiertas bajo el Título V de la Ley de Aire Limpio Federal que fue delegado a dicha agencia y que se recoge en la Parte VI del Reglamento para el Control de la Contaminación Atmosférica (RCCA), vigente. Los permisos expedidos bajo este reglamento a favor de la Autoridad se encuentran codificados bajo los números:

- PFE-TV-4911-63-0212-0244 – Central Generatriz Aguirre
- PFE-TV-4911-31-0397-0021- Central Costa Sur
- PFE-TV-4911-70-1196-0015 – Central Palo Seco[1]
- PFE-TV-4911-65-1196-0016 – Central San Juan[2]
- PFE-TV-4911-07-0897-0043 – Central Cambalache
- PFE-TV-4911-19-0306-0447 - Turbinas de Daguao
- PFE-TV-4911-30-1107-0991 – Turbinas de Jobos
- PFE-TV-4911-63-1196-0014 – Turbinas de Mayagüez
- PFE-TV-4911-74-0106-0021 – Turbinas de Vega Baja
- PFE-TV-4911-77-0707-0759 – Turbinas de Yabucoa

La Autoridad solicita al DRNA flexibilidad con los términos y condiciones establecidos en los permisos aquí mencionados. Además, solicita que, en cuanto a dichos permisos, sus términos y condiciones sean dispensados o pospuestos para lo siguiente:

- Debido a la salida inesperada de la Central Costa Sur que anticipamos quedará fuera de servicio por un año aproximadamente, la Autoridad estará impedida de dar estricto cumplimiento a los términos y condiciones establecidos en el permiso de operación expedido por su agencia para dicha instalación y con los términos y periodos dispuestos en los mencionados permisos. Por lo cual, solicitamos se dispense del cumplimiento de los términos y condiciones del permiso de operación para fuente de emisión antes mencionado. La Autoridad notificará cuando se reinicien las operaciones.

- Se requiere la operación continua de las tres turbinas de gas con capacidad de generación de aproximadamente 23MV que fueron instaladas recientemente mediante una dispensa de emergencia en la Central Palo Seco. Estas unidades aún no cuentan con los controles de emisión para su operación. Se anticipa que

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[1] Permiso incluye modificación a Permiso de Construcción Núm. PFE-65-0499-0365-I-II-C para la conversión a combustible dual para unidades San Juan 5 y 6

[2] Permiso incluye dispensa para Central Palo Seco del 24 de octubre de 2019 para la instalación y operación de tres turbinas de gas.

las emisiones de estas unidades pueden superar el umbral de fuente nueva bajo el programa “PSD” del 40 CFR § 52.21. El 14 de enero de 2020, se presentó la solicitud de permiso de construcción ante el DRNA. Además, se requiere la operación continua de las turbinas de combustión existentes en la central y cubiertas en el Permiso de Operación TV (Ejemplo; PSGT 3-1, entre otras).

- Se requiere la operación continua de las unidades 5 y 6 de Central San Juan (SJ5 convertida a combustible dual recientemente) utilizando combustible diésel sin activar las condiciones establecidas en el permiso de construcción aprobado el 3 de octubre de 2019.

- Se requiere la operación continua de las unidades generatrices en exceso de horas de operación, de consumo de combustible y de emisiones, entre otros.

- Se requiere la operación continua de las unidades generatrices fuera de horario establecido bajo requerimiento de Reglamentación de Contaminación por Ruido.

- Desviaciones al cumplimento de requerimiento del Acuerdo por Consentimiento según incluido en los permisos de operación.

- Desviaciones al cumplimiento de requerimiento del MATS según incluidas en los permisos de operación y construcción.

- Desviaciones a la Regla 403 del RCCA de la Junta de Calidad Ambiental de Puerto Rico, ahora DRNA.

Permisos de Operación Generadores de Electricidad para Emergencias

La Autoridad cuenta con varios permisos de operación de generadores de electricidad para emergencias, expedidos bajo ciertas disposiciones del RCCA de la JCA, vigente, y conforme lo establece el 40 CRF, Parte 63, Subparte ZZZZ: Estándares Nacionales de Emisión para los Contaminantes Atmosféricos Peligrosos para Motores de Pistones de Combustión Interna Estacionarios (RICE NESHAP, por sus siglas en inglés). Como parte de las condiciones específicas de los referidos permisos destacan las limitaciones en cuanto a las horas de uso de operación, capacidad de consumo de combustible, así como el requisito de realizar, radicar y mantener informes mensuales y anuales.

Debido a la situación creada por los dos sismos y debido a la necesidad de complementar la falta de generación, necesaria para servir a nuestros clientes, la Autoridad tiene la necesidad de utilizar estos generadores de electricidad de emergencia a toda capacidad. Se anticipa que la utilización de estos podría sobrepasar los límites de horas de operación y consumo de combustible conforme con lo establecido en dichos permisos. Por lo cual, solicitamos flexibilidad con los términos establecidos en los permisos expedidos bajo esa reglamentación y que se dispense a la Autoridad de cumplir con los términos de horas de uso y capacidad de consumo de combustible y emisiones, entre otros requisitos.

En cuanto a la radicación de los informes, la Autoridad solicita al DRNA que los términos dispuestos en los permisos sean pospuestos o prorrogados, según entienda mejor corresponda a la realidad operacional de esta corporación pública.

Es pertinente mencionar que aun utilizando las unidades existentes a la capacidad que el sistema lo tolere o permita, no será suficiente para satisfacer la demanda que requiere el pueblo de Puerto Rico. Es importante destacar que, ante la fragilidad del sistema eléctrico, la Autoridad evalúa los mecanismos alternos que deberá implementar para sustituir la generación suprimida tras la salida de Costa Sur. Por lo cual, anticipamos que hasta que los mecanismos sean puestos en vigor, la Autoridad podría verse obligada a recurrir al mecanismo de relevos de carga, con la consecuencia inevitable de apagones selectivos en la Isla.

Incluimos copia del *No-Action Assurance Request* presentado ante la EPA donde hicimos una petición similar a la que aquí presentamos, para aquellos asuntos cubiertos bajo la jurisdicción federal, aplicables a las operaciones de la Autoridad.

Apreciamos la colaboración que nos puedan brindar en cuanto a esta solicitud. De requerir información adicional, puede comunicarse con el ingeniero Efran Paredes Maisonet, Director de Planificación y Protección Ambiental, por el (787) 521-4884.

Cordialmente,

José F. Ortiz Vázquez
Principal Oficial Ejecutivo

Anejos

PP-05806

GOBIERNO DE PUERTO RICO

DEPARTAMENTO DE RECURSOS NATURALES Y AMBIENTALES

24 OCT. 2019

ING. JOSÉ ORTIZ
Director Ejecutivo
Autoridad de Energía Eléctrica de Puerto Rico
Apartado 364267
San Juan, PR 00936-4267

Att: Efran Paredes Maisonet
Director Planificación y Protección Ambiental

Estimado ingeniero Ortiz,

Re: Solicitud de Dispensa de Emergencia
Autoridad de Energía Eléctrica de Puerto Rico.
Central Palo Seco
TV-4911-70-1196-0015

En carta con fecha del 11 de octubre de 2019 el Sr. Efran Paredes Maisonet, Director Planificación y Protección Ambiental de la Autoridad de Energía Eléctrica de Puerto Rico (en adelante AEE) presentó una solicitud de dispensa de emergencia para la instalación y operación de tres turbinas de gas con una capacidad de generación de aproximadamente 23 MW. La solicitud se presenta para asegurar la confiabilidad y resiliencia del sistema eléctrico. Esta solicitud se presenta conforme las disposiciones de la Regla 302 del Reglamento para el Control de la Contaminación Atmosférica (RCCA), Reglamento Núm. 5300, según enmendado. El inciso A de la Regla 302 del RCCA establece que:

A) La Junta podrá conceder dispensas de emergencia solo bajo circunstancias muy especiales, como por ejemplo, para evitar una amenaza inminente a la salud.

...

Según establece la AEE en su solicitud de dispensa, actualmente tiene varias unidades de carga base que están fuera de servicios debido a mantenimientos o reparaciones, o están limitadas a parte de su capacidad de generación de electricidad. Esta situación afecta la resiliencia del sistema eléctrico del país. Razón por la cual presentaron la solicitud de dispensa.

Conforme a lo anterior, se aprueba la solicitud de dispensa por un periodo que no podrá exceder de 90 días a partir de la fecha de esta notificación. Durante el periodo de dispensa deberá cumplir con todas las condiciones incluidas en el anejo. La información y condiciones sometidas en su solicitud de permiso forman parte de esta autorización.

DRNA

24 OCT. 2019

De conformidad con la Sección 5.4 de la Ley Núm. 38-2017, conocida como, Ley de Procedimiento Administrativo Uniforme del Gobierno de Puerto Rico, se le apercibe que: "Toda persona a la que la agencia deniegue la concesión de una licencia, franquicia, permiso, endoso, autorización o gestión similar, tendrá derecho a impugnar la determinación de la agencia por medio de un procedimiento adjudicativo, según se establezca en la ley especial de que se trate y en el Capítulo III de dicha Ley." Para esto, se concede un término de veinte (20) días a partir de la notificación del mismo.

La agencia podrá revocar esta autorización en cualquier momento si se violan las condiciones del mismo o reglamentos y/o regulaciones aplicables. La agencia, además, podrá emitir una Orden de Cese y Desistimiento y Mostrar Causa.

Cualquier duda o pregunta, puede comunicarse con el Ing. Luis Sierra, Gerente Interino del Área de Calidad de Aire, al 787-767-8181, extensión 2300, o a través del correo electrónico luissierra@jca.pr.gov.

Cordialmente,

Tania Vázquez Rivera
Secretaria

TVR/lst

24 OCT. 2019

ANEJO: CONDICIONES DE DISPENSA

1. Por este medio se autoriza una dispensa por emergencia la instalación y operación de tres turbinas de gas en la Central Palo Seco, con una capacidad de generación de aproximadamente 23 MW cada una. Esta dispensa tendrá una duración que no excederá de 90 días a partir de la aprobación de la misma.
2. Deberá mantener copia de esta dispensa en la instalación en todo momento. La misma estará disponible para inspección por el personal técnico del Departamento de Recursos Naturales y Ambientales (en adelante DRNA) o la Agencia Federal de Protección Ambiental (EPA, en inglés).
3. Una vez culmine la dispensa, las unidades deberán ser desconectadas, a menos que un permiso para la construcción para las unidades, según las disposiciones de la Regla 203 del Reglamento 5300, según enmendado, haya sido emitido por esta agencia.
4. Esta dispensa no exime de acciones de cumplimiento y/o legales por la construcción/instalación de las unidades previo a la otorgación de esta dispensa de emergencia.
5. Para la operación de los generadores, el contenido máximo de azufre en el combustible No. 2 no excederá de 0.5 porciento por peso y en el gas natural no excederá de 5 gr/100 sft^3.
6. Deberá tener un registro de operación y consumo de combustible con contenido de azufre y horas de operación para cada turbina.
7. Deberá enviar un informe de aplicabilidad, y/o notificación inicial de ser necesario, con respecto a las disposiciones del 40 CFR, Parte 60, Subparte GG, Subparte KKKK o cualquier otra regulación que sea aplicable a las turbinas. Deberán indicar en el informe todos los requisitos aplicables a la unidad de emisión. De existir regulaciones que sean potencialmente aplicables, deberá indicar en el informe las razones por las cuales no le aplica.
8. Deberá cumplir con todos los requisitos aplicables en el informe enviado a la agencia. El no identificar adecuadamente la regulación aplicable, no les exime de incumplimiento con la regulación federal y/o estatal.
9. Estas unidades fueron clasificadas en su solicitud de dispensa como unidades estacionarias de emisión. Deberá llevar a cabo las pruebas de funcionamiento requeridas por la regulación federal para fuentes estacionarias, en los términos establecidos en el estándar de emisión aplicable.
10. Deberá someter un informe mensual indicando en una base diaria el contenido de azufre (porciento por peso) en los combustibles quemados o consumidos en la unidad durante cada mes. Este informe será enviado a la Junta a la atención de la Jefa de la División de Validación de Datos Modelaje Matemático del Área de Calidad de Aire, la Sra. Lula Lucia Fernández Fontán. Todos los informes mensuales deberán ser enviados en o antes de los treinta (30) días siguientes al final de cada mes natural.
11. La tonalidad de los gases emitidos durante la operación de cada motor incluido en este permiso no excederá del 20% de opacidad. Se permitirá una tonalidad de hasta 60% de opacidad sólo en un periodo no mayor de 4 minutos dentro de cualquier periodo de 30 minutos consecutivos.

Hogan Lovells

Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004
T +1 202 637 5600
F +1 202 637 5910
www.hoganlovells.com

January 14, 2020

By Electronic Mail

Ms. Susan Bodine
Assistant Administrator
Office of Enforcement & Compliance Assurance
U.S. Environmental Protection Agency
Mail Code 2201A
1200 Pennsylvania Ave, N.W.
Washington, DC 20460

Mr. Phillip A. Brooks
Director
Air Enforcement Division
Office of Civil Enforcement
U.S. Environmental Protection Agency
Mail Code 2242A
1200 Pennsylvania Ave, N.W.
Washington, DC 20460

Re: No-Action Assurance Extension Request – Puerto Rico Electric Power Authority – Earthquakes

Dear Ms. Bodine and Mr. Brooks:

I write on behalf of the Puerto Rico Electric Power Authority ("PREPA") to request that the United States Environmental Protection Agency ("EPA") issue a no-action assurance due to the extreme circumstances that have arisen in the Commonwealth of Puerto Rico caused by a series of earthquakes occurring in and around the Guanica municipal area in the southwest region of Puerto Rico. On January 7, 2020, the Governor of Puerto Rico issued an executive order declaring a state of emergency for the Commonwealth of Puerto Rico to facilitate the deployment of resources necessary to respond to the widespread destruction caused by the earthquakes. Specifically, PREPA writes requesting that EPA exercise its discretion to not enforce the requirements of PREPA's Clean Air Act permits,[1] the Mercury and Air Toxics Standards ("MATS"),[2] the Puerto Rico

[1] The applicable Title V permits include permit numbers PFE-TV-4911-63-0212-0244 (Aguirre Power Station), PFE-TV-4911-70-1196-0015 (Palo Seco Steam Power Plant), TV-4911-70-1196-0015 TV-4911-31-0397-0021 (South Coast Steam Power Plant), PFE-TV-4911-65-1196-0016 (San Juan Steam Power Plant), TV-4911-63-1196-0014 (Mayaguez), PFTE-TV-4911-07-0897-0043 (Cambalache Combustion Turbine Plant), PFE-TV-4911-19-0306-0447 (Daguao Turbine Power Block), PFE-TV-4911-30-1107-0991 (Jobos Turbine Power Block), , and PFE-TV-4911-77-0707-0759 (Yabucoa Gas Turbine Power Block). The applicable permits and authorizations also include a letter from the Puerto Rico Department of Natural and Environmental Resources RE "Solicitude de Dispensa de Emergencia," TV-4911-70-1196-0015 (approval of waiver request to install and operate three gas turbines at Palo Seco Steam Power Plant), Modified Construction Permit for San Juan Power Plant PFE-65-0499-0365-I-II-C (Natural Gas Conversion project), and the letter from U.S. EPA to PREPA RE "Prevention of Significant Deterioration of

State Implementation Plan ("SIP"),[3] other applicable provisions of or regulations under the Clean Air Act, and the provisions of the 1999 Consent Decree between the United States of America and PREPA. A no-action assurance is necessary to protect public welfare as the Commonwealth of Puerto Rico and PREPA respond to the extreme circumstances created by the series of earthquakes that have occurred in and around Puerto Rico since the end of December 2019, which includes at least six earthquakes of a 5.0 magnitude or greater.

The Costa Sur power plant in the southern town of Guayanilla, located near the epicenter of the January 7, 2020 earthquakes of 6.4- and 5.6-magnitude, experienced significant damage to Costa Sur units nos. 5 (410 megawatts (MW)) and 6 (410MW), and to ancillary equipment serving those units. Due to ongoing earthquake activity, and the instability of the Costa Sur power complex, PREPA personnel have not been permitted on-site to fully assess the impact of the earthquakes. Current estimates are that it will take months to affect repairs to the damaged units and equipment, which could remain offline for up to one year. The damaged units provide approximately 25% of the baseload generated electricity used by homes and businesses on the island.

With Costa Sur out of service due to the impact of the earthquakes, Puerto Rico needs to rely on its other power plants to operate almost at full capacity to meet demand and to ensure the protection of public health.[4] As of the writing of this letter, PREPA has restored power to approximately 98% of Puerto Rico's approximately 1.4 million customers. Nonetheless, once the power is fully restored, Puerto Rico will have no reserve capacity, and there will be little leeway for any of its plants to go offline, which could lead to possible blackouts or brownouts. At this time, PREPA is considering emergency measures, including the rationing of power amongst the island's power sector grids, to ensure the maintenance of power. The graph below projects PREPA's generation deficit from January 1, 2020 through December 2020 under three operating scenarios.

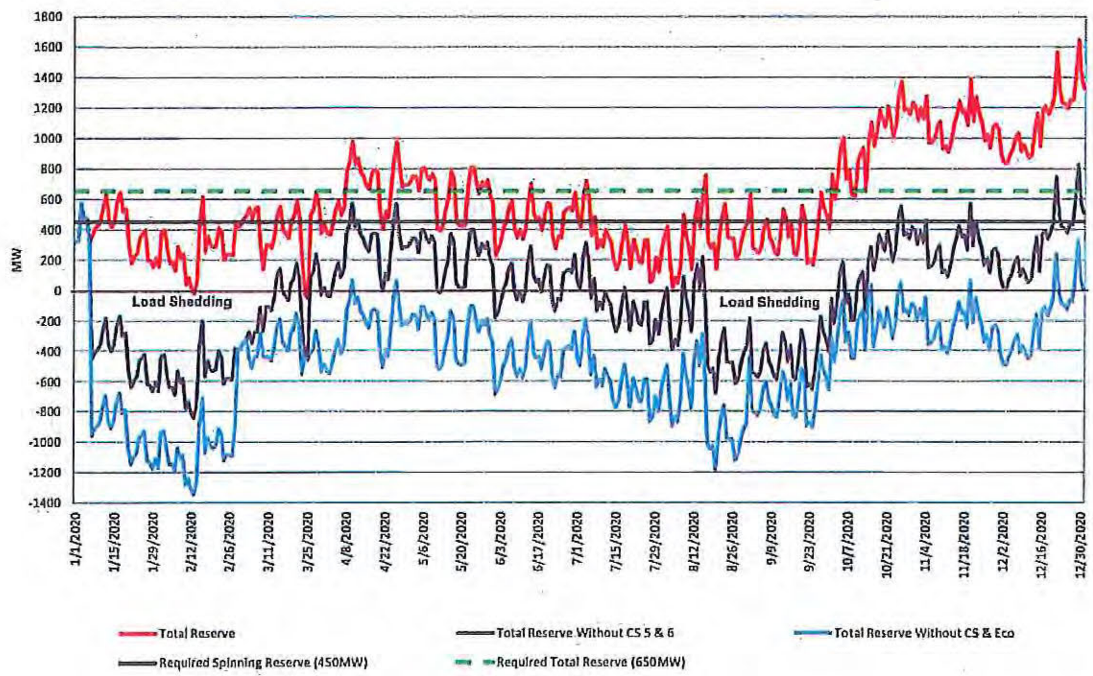
Air Quality (PSD) Non-Applicability Analysis of San Juan Units 5 and 6 Fuel Conversion Project," dated July 19, 2019.

[2] *See generally* 40 C.F.R. Part 63, Subpart UUUU; *see also id.* tbl 2 (listing a filterable particulate matter limit of 0.03 lb/MMBtu for liquid oil-fired non-continental generating units).

[3] *See generally* 40 C.F.R. Part 52, Subpart BBB.

[4] Private power providers, such as EcoEléctrica, also remain offline due to the emergency situation caused by the earthquake.

PREPA's Electric System Reserve
CS & Eco offline after Earthquake Event on January 7, 2020



In the above graph, the green dotted line shows PREPA's required 650 MW total grid reserve, while the bold black line shows PREPA's required 450 MW spinning reserve or "synchronous reserve." Under normal operating conditions, the 450 MW spinning reserve is provided by units already in service or "synched" to the grid, while the additional 200 MW spinning reserve is "non-synchronous" and is covered by offline peaking plants. When the reserve is at 0 MW, it means that PREPA has no reserve, and when the reserve is negative, it means that if PREPA experiences a further disturbance that causes it to lose generation, or is not able to bring other generating units online, that lost generation will result in load shedding.

With that context, the red line shows the reserve from PREPA's baseline power generation, reflecting business as usual prior to the earthquakes. In particular, the red line considers Costa Sur units nos. 5 and 6 in operation, and all operating units in compliance with applicable Clean Air Act requirements, permit conditions, and consent decree obligations. The purple line shows the reserve from PREPA's baseline load generation with Costa Sur units nos. 5 and 6 out of operation as a result of the earthquakes. The blue line shows the reserve from PREPA's baseload generation if Costa Sur units nos. 5 and 6 as well as EcoEléctrica are out of operation.

At this time, PREPA is still gathering information on the full extent of the flexibility needed to provide power to the island, and it will continue to provide further information to EPA as it becomes available. Based on the foregoing, and the need to ensure that the citizens of Puerto Rico have electricity, PREPA requests a no action assurance as set forth in Table 1:

TABLE 1: Clean Air Act Requirements

Facility	Unit	Clean Air Act Requirements and Title V Permit Obligations
San Juan	5 (160MW)	For performance of conditions under the Modified Construction Permit, PFE-65-0499-0365-I-II-C (Natural gas conversion project). Further, under the circumstances, PREPA expects significant delays in required performance testing, maintenance obligations, and associated notification, recordkeeping and reporting obligations.
San Juan	6 (160MW)	For performance of conditions under the Modified Construction Permit, PFE-65-0499-0365-I-II-C (Natural gas conversion project). Further, under the circumstances, PREPA expects significant delays in required performance testing, maintenance obligations, and associated notification, recordkeeping and reporting obligations.
San Juan	7 (100MW)	This unit is as a designated MATS limited use unit. PREPA will be required to run this unit beyond the limited use restrictions imposed by MATS. For performance under the 1999 Consent Decree.
San Juan	8 (100MW)	This unit is designated as a MATS limited use unit. PREPA will be required to run this unit beyond the limited use restrictions imposed by MATS. For performance under the 1999 Consent Decree.
San Juan	9 (100MW)	MATS requirements related to particulate matter ("PM") emissions limitation of 0.030 lb/MMBTU, associated performance testing requirements, and work practice standards. For performance under the 1999 Consent Decree.
Costa Sur	5 (410MW)	For performance under the 1999 Consent Decree related to required reporting obligations. For safety reasons, PREPA has limited and restricted access to the site, including restricted access to data and systems necessary to complete reporting obligations.
Costa Sur	6 (410MW)	For performance under the 1999 Consent Decree related to required reporting obligations. For safety reasons, PREPA has

Facility	Unit	Clean Air Act Requirements and Title V Permit Obligations
		limited and restricted access to the site, including restricted access to data and systems necessary to complete reporting obligations.
Palo Seco	1 (85MW)	This unit is designated as a MATS limited use unit. PREPA will be required to run this unit beyond the limited use restrictions imposed by MATS. For performance under the 1999 Consent Decree Palo Seco Title V Permit conditions related to MATS compliance and the 1999 Consent Decree requirements incorporated into the Title V permit.
Palo Seco	3 (216MW)	MATS requirements related to particulate matter ("PM") emissions limitation of 0.030 lb/MMBTU, associated performance testing requirements, and work practice standards. For performance under the 1999 Consent Decree. Palo Seco Title V Permit conditions related to MATS compliance and the 1999 Consent Decree requirements incorporated into the Title V permit.
Palo Seco	4 (216MW)	MATS requirements related to particulate matter ("PM") emissions limitation of 0.030 lb/MMBTU, associated performance testing requirements, and work practice standards. For performance under the 1999 Consent Decree. Palo Seco Title V Permit conditions related to MATS compliance and the 1999 Consent Decree requirements incorporated into the Title V permit.
Palo Seco	GT 1-1 (21MW)	Palo Seco Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions.
Palo Seco	GT 1-2 (21MW)	Palo Seco Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions.
Palo Seco	GT 3-1 (21MW)	Palo Seco Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions.

Facility	Unit	Clean Air Act Requirements and Title V Permit Obligations
Palo Seco	Mobile Pack 1 (1411) (23MW)	For compliance with itemized conditions under the letter from the Puerto Rico Department of Natural and Environmental Resources RE "Solicitude de Dispensa de Emergencia," dated October 24, 2019, TV-4911-70-1196-0015, approving a waiver request to install and operate three gas turbines at the Palo Seco Steam Power Plant ("Emergency Waiver"), and the Prevention of Significant Deterioration ("PSD") emissions thresholds that are expected to be exceeded. When the Emergency Waiver expires, for performance under the Puerto Rico Regulation for Control of Atmospheric Pollution (40 C.F.R. § 52.2723) related to permit requirements and emissions limits. For performance under other applicable Clean Air Act requirements, including but not limited to 40 C.F.R. Part 60, Subpart KKKK and 40 C.F.R. Part 63, Subpart YYYY.
Palo Seco	Mobile Pack 1 (1410) (23MW)	For compliance with itemized conditions under the letter from the Puerto Rico Department of Natural and Environmental Resources RE "Solicitude de Dispensa de Emergencia," dated October 24, 2019, TV-4911-70-1196-0015, approving a waiver request to install and operate three gas turbines at the Palo Seco Steam Power Plant ("Emergency Waiver"), and the Prevention of Significant Deterioration ("PSD") emissions thresholds that are expected to be exceeded. When the Emergency Waiver expires, for performance under the Puerto Rico Regulation for Control of Atmospheric Pollution (40 C.F.R. § 52.2723) related to permit requirements and emissions limits. For performance under other applicable Clean Air Act requirements, including but not limited to 40 C.F.R. Part 60, Subpart KKKK and 40 C.F.R. Part 63, Subpart YYYY.
Palo Seco	Mobile Pack 1 (1412) (23MW)	For compliance with itemized conditions under the letter from the Puerto Rico Department of Natural and Environmental Resources RE "Solicitude de Dispensa de Emergencia," dated October 24, 2019, TV-4911-70-1196-0015, approving a waiver request to install and operate three gas turbines at the Palo Seco Steam Power Plant ("Emergency Waiver"), and the Prevention of Significant Deterioration ("PSD") emissions thresholds that are expected to be exceeded.

Facility	Unit	Clean Air Act Requirements and Title V Permit Obligations
		When the Emergency Waiver expires, for performance under the Puerto Rico Regulation for Control of Atmospheric Pollution (40 C.F.R. § 52.2723) related to permit requirements and emissions limits. For performance under other applicable Clean Air Act requirements, including but not limited to 40 C.F.R. Part 60, Subpart KKKK and 40 C.F.R. Part 63, Subpart YYYY.
Aguirre	1 (450MW)	MATS requirements related to the particulate matter ("PM") emissions limit of 0.030 lb/MMBTU, associated performance testing requirements, and work practice standards. For performance under the 1999 Consent Decree.
Aguirre	Combined cycle gas turbine "CCGT" 1-1 (50MW)	Aguirre Title V permit conditions related to fuel quality requirements, and fuel consumption limits (barrels per year), which will directly impact annual emissions.
Aguirre	CCGT 1-2 (50MW)	Aguirre Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions.
Aguirre	CCGT 1-3 (50MW)	Aguirre Title V permit conditions related to fuel quality requirements, and fuel consumption limits (barrels per year), which will directly impact annual emissions.
Aguirre	CCGT 1-4 (50MW)	Aguirre Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions.
Aguirre	CCGT 2-1 (50MW)	Aguirre Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions.
Aguirre	CCGT 2-3 (50MW)	Aguirre Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions.
Aguirre	CCGT 2-4 (50MW)	Aguirre Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions.

Facility	Unit	Clean Air Act Requirements and Title V Permit Obligations
Mayaguez	GT-5 (54MW)	Mayaguez Title V permit conditions related to fuel quality requirements, and fuel consumption limits (barrels per year), which will directly impact annual emissions and other permit conditions (e.g., emissions control).
Mayaguez	GT-6 (54MW)	Mayaguez Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions.
Mayaguez	GT-7 (54MW)	Mayaguez Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions and other permit conditions (e.g., emissions control).
Mayaguez	GT-8 (54MW)	Mayaguez Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions and other permit conditions (e.g. emissions control).
Cambalache Peakers	2 (83MW)	Cambalache Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions.
Cambalache Peakers	3 (83MW)	Cambalache Title V permit conditions related to fuel quality requirements and fuel consumption limits (barrels per year), which will directly impact annual emissions.
Daguao Peakers	GT 1-1 (21MW)	Daguao Title V permit conditions related to fuel quality requirements fuel consumption limits (barrels per year), which will directly impact annual emissions; and noise control requirements (hours operating restrictions) required by Commonwealth ordinance and PR Rule for the Control of Noise Pollution.
Daguao Peakers	GT 1-2 (21MW)	Daguao Title V permit conditions related to fuel quality; fuel consumption limits (barrels per year), which will directly impact annual emissions; and noise control requirements (hours operating restrictions) required by Commonwealth ordinance PR Rule for the Control of Noise Pollution.
Yabucoa Peakers	GT 1-1 (21MW)	Yabucoa Title V permit conditions related to fuel quality requirements fuel consumption limits (barrels per year), which will directly impact annual emissions; and noise control requirements

Facility	Unit	Clean Air Act Requirements and Title V Permit Obligations
		(hours operating restrictions) required by Commonwealth ordinance PR Rule for the Control of Noise Pollution.
Jobos Peakers	GT 1-2 (21MW)	Jobos Title V permit conditions related to fuel quality requirements fuel consumption limits (barrels per year), which will directly impact annual emissions; and noise control requirements (hours operating restrictions) required by Commonwealth ordinance PR Rule for the Control of Noise Pollution.
	Internal Combustion Engines	PREPA will be required to run these combustion engines in excess of this limit.

PREPA identifies in Table 1 the basic Clean Air Act-related requirements that are implicated by PREPA's need to operate the listed units at or near their full capacity. PREPA will address any variations in operating unit conditions. PREPA is not now seeking to cover with this request for a no action assurance(s) PREPA power generating units that are currently offline but that are expected to return to service. Should those units become available, PREPA may need to seek additional relief from EPA in the form of further no action assurance(s). Under the circumstances, PREPA cannot reasonably predict the precise timeframe in which it will require additional regulatory flexibility, but PREPA will use its best efforts to keep EPA abreast of the restoration of its grid and its progress towards a resumption of normal operation.

PREPA knows that EPA is taking all possible measures to assist the Commonwealth in responding to, and recovering from, the earthquakes, and we stand ready to support the agency in those measures. We look forward to hearing from you soon.

Respectfully submitted,

Adam M. Kushner

Adam M. Kushner

Partner
adam.kushner@hoganlovells.com
D +1 202 637 5724

Cc: Mr. Eric Schaaf, EPA Region 2 Counsel
Ms. Carmen Guerrero, EPA Caribbean Office
Mr. Armando Otero, Acting Secretary, Puerto Rico Department of Natural and Environmental Resources

GOVERNMENT OF PUERTO RICO
Puerto Rico Electric Power Authority

December 17, 2019

Eng. Luis R. Sierra Torres, Chief
Inspection and Compliance Division
Acting Director, Air Quality Area
Department of Natural and Environmental Resources
PO Box 11488
San Juan, Puerto Rico 00910

Subject: Permit to Construct Application for Proposed Peaking Combustion Turbines to Replace Existing Units PSGT 2-2, 3-1, and 3-2 at our Palo Seco Plant

Dear engineer Sierra:

The Puerto Rico Electric Power Authority (PREPA) presents the New Source Review (NSR) applicability analysis and Construction Permit Application (See Appendix A) to replace combustion turbine units PSGT 2-2, 3-1, and 3-2 at the Palo Seco Power Plant (Central Palo Seco or the plant) with PW Power Systems (PWPS) model FT8® MOBILEPAC dual fuel combustion turbines ("project "). The proposed dual fuel combustion turbines will initially fire distillate oil as the sole fuel. When natural gas becomes available, it is expected that natural gas will be the primary fuel with backup firing of distillate oil. The project will also include the installation of three black start generators (BSGs) engines to support startup of the new combustion turbines during periods when the transmission system is down. As described below, the project will not result in a significant increase of any pollutant regulated under the NSR Program of the Environmental Protection Agency of the United States (EPA). Therefore, the project is not subject to NSR permitting requirements.

The project is a crucial component of PREPA's plan to transition its generation fleet to cleaner fuels, including natural gas. This transition is expected to have significant environmental and economic benefits for Puerto Rico. Among other things, this project: a) will improve the profile of the total emissions of the Central Palo Seco plant, b) will result in significant cost savings for our customers due to the projected lower price of natural gas as compared to oil as well as the higher efficiency of the new turbines; and c) improve the reliability of the System. The Project is vital, especially in the recovery of Puerto Rico after the devastation caused by recent hurricanes, to improve reliability and PREPA fleet diversity. In advance, PREPA appreciates the continued support that the Department of Natural and Environmental Resources (DNER/EQB) has always given us and whoever will provide us support during this transition.

Introduction

PREPA plans to replace combustion turbine units PSGT 2-2, 3-1, and 3-2 at Central Palo Seco with PWPS model FT8® MOBILEPAC dual fuel combustion turbines. The proposed dual fuel combustion turbines will fire distillate oil and natural gas when it becomes available. The BSGs will be fired solely with ultra-low sulfur distillate oil (ULSD). The fuel conversion project is necessary to ensure reliable energy to Puerto Rico. PREPA applied to EQB requesting an Emergency Waiver for the Installation of (3) Combustion Turbines at Palo Seco under PRCCAP Rule 302, EQB granted this request on October 24, 2019.

The NSR regulations do not require projects that involve only simple cycle combustion turbines (i.e. electric generating units that do not use steam) and net out of PSD to provide the EPA with the netting analysis prior to construction. In accordance with 40 CFR §52.21(r)(6)(ii) as a modification of an existing major NSR source, PREPA must develop the following information prior to beginning construction of the project: a description of the project; identification of the emission unit(s), whose contaminant regulated by the NSR may be affected for the project; and a description of the applicability test used to determine that the project is not a major modification for any regulated pollutant of the NSR, including current reference emissions (Baseline), current emissions projected, the amount of emissions excluded and an explanation why such amount, and net verification calculations, if applicable. This application provides PREPA's analysis in compliance with the NSR regulations for the proposed project and was prepared and submitted to the DNER/EQB in accordance with Rule 203 of the Regulations for the Control of Atmospheric Pollution of the EQB (RCAP) and 40 CFR §52.21(r)(6)(i).

As described below, PREPA determined that the project will not result in a significant increase in emissions above current baseline emissions for any regulated pollutant of the NSR. This analysis was performed in accordance with the applicability test provisions pursuant to 40 CFR §52.21(a)(2)(iv)(d) for projects that only involve construction of new emissions units. This test compares the potential emissions from the proposed new emission units to the baseline actual emissions. For this analysis, PREPA has proposed enforceable emission limits on the new PWPS model FT8® MOBILEPAC combustion turbines and the BSGs. In addition to the proposed new combustion turbines and BSGs, the project will include new natural gas handling infrastructure at the facility. Potential fugitive natural gas emissions from the new natural gas handling infrastructure were also estimated. Fugitive natural gas emissions will include methane as greenhouse gases (GHGs) with small amounts of volatile organic compounds (VOCs).

Natural gas will be provided by pipeline from a proposed fuel management facility in the metropolitan area. The fuel management facility will be owned and operated by a separate entity and PREPA will not have any ownership or control of this facility. The fuel management facility will not be part of the Palo Seco Power Plant and therefore is not considered part of the project according to 40 CFR §52.21(b)(6)(i).

PREPA's analysis of applicability demonstrates that the project will not result in a significant increase in the emissions of any NSR regulated contaminant. So, it is not necessary for PREPA to obtain a permit under the NSR program. The technical evaluation was carried out by environmental consultants of PREPA and these are available to answer any questions that the DNER/EQB.

Project Description

The plant includes four (4) boilers with No. 6 oil burning and steam turbines (Units 1-4) and six (6) simple cycle combustion turbines firing No. 2 oil (Units PSGT 1-1, 1-2, 2-1, 2-2, 3-1, and 3-2). Each simple cycle combustion turbine is rated at 301.5 million British Thermal Units per hour (MMBtu/hr) with an output per unit of approximately 21 megawatts (MW). The project includes replacing simple cycle combustion turbine Units PSGT 2-2, 3-1, and 3-2 with three new PWPS model FT8® MOBILEPAC combustion turbines and the three BSGs. The proposed PWPS model FT8® MOBILEPAC combustion turbines will be rated at 294.8 MMBtu/hr firing natural gas and 283.3 MMBtu/hr firing distillate oil with an output per unit of approximately 27.9 MW. The proposed BSGs will be Caterpillar Model C13 emergency generator engines; the engines will be rated at 609 brake-horsepower (bhp) powering an electric generator rated at 400 kilowatts (kW).

In addition to the new combustion turbines and BSGs, new systems will be necessary for support of the project including natural gas supply infrastructure on site. The natural gas supply infrastructure will include pipes and their supports, pressure control systems, interconnections in the plant, and a measurement system. The three new combustion turbines will be equipped with independent natural gas meters for continuous monitoring and recording of natural gas consumption.

The existing boilers and combustion turbines were commissioned between 1960 and 1973, prior to the promulgation of the prevention significant deterioration (PSD) program, and therefore were not subject to PSD permitting. However, based upon the potential emissions from the existing emission sources, the plant is an existing major source under the (PSD) program for emissions of nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM), PM with a diameter equal to or less than 10 micrometers (PM_{10}), PM with a diameter equal to or less than 2.5 micrometers ($PM_{2.5}$), VOCs, GHGs and sulfuric acid mist (H_2SO_4). Therefore, any modifications at the facility, including modifications to existing emission units or installation of new emission units, must be evaluated against the applicable PSD significance thresholds for each PSD regulated pollutant.

The project includes installation of new emission units and therefore, an evaluation is required to determine if the project meets the requirements of a "major modification" as defined under 40 CFR §52.21(b)(2)(i). The project will be considered a major modification if it results in a significant emissions increase (as defined in 40 CFR §52.21(b)(40)) of a regulated NSR pollutant and a significant net emissions increase of that pollutant (as defined in 40 CFR §52.21(b)(3)(i)). The project will result in a significant emissions increase if the combined potential emissions of the new combustion turbines, BSGs, and the natural gas handling equipment exceeds a PSD significance threshold for one or more pollutants. Net emissions are defined in 40 CFR §52.21(b)(3)(i) and include the increase in emissions from the proposed new emission sources and any other creditable increase and reduction in emissions at the plant that is contemporaneous with the project. In accordance with 40 CFR §52.21(a)(2)(iv)(a), the project will be a major modification if it causes two types of emissions increases, a significant emissions increase (as defined in 40 CFR §52.21 (b)(40)), and a significant net emissions increase (as defined in 40 CFR §52.21(b)(3) and 40 CFR §52.21(b)(23)).

The project will include only new emission sources. Therefore, the significant emissions increase (as defined in 40 CFR §52.21(b)(40)) evaluation was carried out according to 40 CFR §52.21(a)(2)(iv)(d), which includes an actual-to-potential test for projects that only involve construction of a new emissions units. The significant net emissions increase (as defined in §52.21(b)(3) and §52.21(b)(23)) evaluation includes the potential emissions increase from the proposed new emission sources minus the creditable reduction in actual emissions from the shutdown of Units PSGT 2-2, 3-1, and 3-2. As detailed below, the results of this applicability test show that there will be a significant increase in emissions but not a significant net emissions increase of a regulated pollutant by the NSR as a result of the project. Therefore, the proposed project does not trigger PSD permitting.

Significant Increase in Emissions Test

In accordance with 40 CFR §52.21(a)(2)(iv)(d), for projects that only include new emission units, a significant emissions increase of a regulated NSR pollutant occurs if the sum of the difference between the potential to emit (as defined in 40 CFR §52.21(b)(4)) from each new emissions unit following completion of the project, and the baseline actual emissions (as defined in 40 CFR §52.21(b)(48)(iii)) of these units before the project, equals or exceeds the significant amount for that pollutant (as defined in 40 CFR §52.21(b)(23)). As defined under 40 CFR §52.21(b)(48)(iii), the baseline emissions of the new emission units shall equal zero. Therefore, the increase in emissions will be equal to the potential emissions of the new emission units, which includes the three proposed combustion turbines, three BSGs, and onsite natural gas handling equipment.

Pursuant to 40 CFR §52.21(b)(4), potential to emit means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable. Secondary emissions do not count in determining the potential to emit. Pursuant to 40 CFR §52.21(b)(18), secondary emissions include emissions from any offsite support facility which would not be constructed or increase its emissions except as a result of the construction or operation of the major stationary source or major modification. Secondary emissions also do not include emissions from a mobile source.

Provided in Table 1 is a summary of the potential emissions from the proposed new emission sources versus the applicable PSD significance thresholds. Emissions of NO_x, PM, PM_{10}, $PM_{2.5}$, VOC and CO from the proposed combustion turbines and BSGs are based upon vendor performance emissions data. Emissions of SO_2 are based upon the maximum sulfur content of the fuels, which will be 5 grains per 100 cubic feet of natural gas and 0.05 percent for distillate oil.

H_2SO_4 emissions are based upon 10 percent conversion of SO_2 to H_2SO_4. Emissions of GHGs are based upon the emission factors in 40 CFR §98, Subpart A, Table A-1 and 40 CFR §98, Subpart C, Tables C-1 and C-2.

PREPA is proposing to assume federally enforceable limits on emissions from the combustion turbines to meet the requirements of 40 CFR §52.21(b)(4). PREPA is proposing to quantify emissions each day from the combustion turbines and calculate rolling 365-day emissions to document that the emissions are below the proposed caps. Each BSG will be limited to no more than 500 hours per year.

The natural gas supply infrastructure will be a new source of emissions from the plant with fugitive natural gas emissions from the connections, valves, meters, and other system components. These emissions will be composed of methane (as GHGs) with a small amount of VOCs. An estimate of potential fugitive emissions was conducted based on EPA emission factors from the "*Protocol for Emission Estimates in Equipment Leaks*" (November 1995) and the inventory of components in the diagram of pipe and instrumentation for natural gas supply infrastructure. The potential fugitive emissions are based upon 8,760 hours per year. This analysis results in possible VOC emissions of less than 1 tpy as documented in Appendix B.

Table 1: Significant Increase in Emissions Test

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Pollutant	Combustion Turbine Potential (tpy)	BSGs Potential (tpy)	Natural Gas Handling Potential (tpy)	Project Total Potential (tpy)	PSD Significance Threshold (tpy)
NO_x	191.34	4.92	0	196.4	40
PM	19.57	0.13	0	19.7	25
PM_{10}	19.57	0.13	0	19.7	15
$PM_{2.5}$	19.57	0.13	0	19.7	10
CO	99.45	2.29	0	101.7	100
VOC	7.85	0.14	0.55	8.54	40
SO_2	55.82	0.004	0	55.8	40
H_2SO_4	8.55	0.001	0	8.55	7
GHGs (as CO_2e)	180,889	481	124	181,494	75,000

Table 1 shows that the project will result in a significant increase in emissions of NO_x, PM_{10}, $PM_{2.5}$, CO, SO_2, H_2SO_4, and GHGs as defined in §52.21(b)(40). Therefore, an evaluation must be conducted for these pollutants to determine if there will be a significant net emissions increase as defined in 40 CFR §52.21(b)(3) and §52.21(b)(23). There will not be a significant increase in emissions of PM and VOC and therefore a net emissions increase evaluation is not required for these pollutants.

Significant Net Increase in Emissions Test

An evaluation of the net emissions increases of the project, as defined in 40 CFR §52.21(b)(3), was conducted to determine if the net emissions increase would be significant for one or more of the pollutants determined to have a significant increase in emissions in the first step. Pursuant to 40 CFR §52.21(b)(3)(i), net emissions increase means the amount by which the sum of the following exceeds zero:

a) The increase in emissions from a particular physical change or change in the method of operation at a stationary source as calculated pursuant to paragraph 40 CFR §52.21(a)(2)(iv); and

b) Any other increases and decreases in actual emissions at the major stationary source that are contemporaneous with the particular change and are otherwise creditable. Baseline actual emissions for calculating increases and decreases shall be determined as provided in paragraph 40 CFR §52.21(b)(48), except that paragraphs 40 CFR §52.21(b)(48)(i)(*c*) and (b)(48)(ii)(*d*) shall not apply.

The increase in emissions for 40 CFR §52.21(b)(3)(i)(a) is equal to the project total potential emissions presented in Table 1. Pursuant to 40 CFR §52.21(b)(3)(ii), an increase or decrease in actual emissions is contemporaneous only if it occurs between the date five years before construction on the project and the date that the increase from the project occurs. There are no contemporaneous increases in emissions at the plant to be accounted for in the net emissions increase analysis. There will be a contemporaneous reduction in actual emissions resulting from the shutdown of units PSGT 2-2, 3-1, and 3-2. Pursuant to 40 CFR §52.21(b)(3)(vi), the contemporaneous reduction in actual emissions resulting from the shutdown of units PSGT 2-2, 3-1, and 3-2 is creditable only to the extent that:

a. The old level of actual emissions or the old level of allowable emissions, whichever is lower, exceeds the new level of actual emissions;

b. It is enforceable as a practical matter at and after the time that actual construction on the particular change begins; and

c. It has approximately the same qualitative significance for public health and welfare as that attributed to the increase from the particular change.

The contemporaneous reduction in actual emissions resulting from the shutdown of units PSGT 2-2, 3-1, and 3-2 is creditable as it meets all of the criteria:

a. Units PSGT 2-2, 3-1, and 3-2 will be shut down and therefore the new level of actual emissions after the project will be zero;

b. The reduction in emissions from units PSGT 2-2, 3-1, and 3-2 will be enforceable at and after the time that actual construction on the proposed project begins; and

c. The reduction in emissions will occur at the same facility and from the same type of stationary source and therefore, will have approximately the same qualitative significance for public health and welfare as that attributed to the increase from the project.

As the reduction in emissions from the shutdown of units PSGT 2-2, 3-1, and 3-2 is both contemporaneous and creditable, this reduction can be accounted for in the net emissions increase analysis for the project.

Baseline Emissions of PSGT 2-2, 3-1, and 3-2

The reduction in emissions is equal to the baseline actual emissions of units PSGT 2-2, 3-1, and 3-2 as determined in accordance with 40 CFR §52.21(b)(48), except that paragraphs 40 CFR §52.21(b)(48)(i)(*c*) and (b)(48)(ii)(*d*) shall not apply. Units PSGT 2-2, 3-1, and 3-2 are not electric utility steam generating units and therefore, in accordance with 40 CFR §52.21(b)(48)(ii), baseline emissions means the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 10-year period immediately preceding either the start of construction of the project or the date a complete permit application is received by the Administrator for a permit required under this section or by the reviewing authority for a permit required by a plan, whichever is earlier. Therefore, the applicable baseline period is any consecutive 24-month period within 10-years from the filing of this complete application.

Pursuant to 40 CFR §52.21(b)(48)(ii)(*a*) through (*c*), the baseline emissions shall account for the following:

(a) Shall include fugitive emissions to the extent quantifiable, and emissions associated with startups, shutdowns, and malfunctions.

(b) Shall be adjusted downward to exclude any non-compliant emissions that occurred while the source was operating above an emission limitation that was legally enforceable during the consecutive 24-month period.

(c) Shall be adjusted downward to exclude any emissions that would have exceeded an emission limitation with which the major stationary source must currently comply, had such major stationary source been required to comply with such limitations during the consecutive 24-month period.

There are no fugitive emissions from units PSGT 2-2, 3-1, and 3-2 and emissions associated with startups, shutdowns, and malfunctions are not quantifiable. Units PSGT 2-2, 3-1, and 3-2 do not have any emission limitations for NO_x, PM_{10}, $PM_{2.5}$, CO, SO_2, H_2SO_4, and GHGs. Therefore, the baseline emissions do not need to be adjusted in any manner to address 40 CFR §52.21(b)(48)(ii)(*a*) through (*c*).

Baseline emissions from units PSGT 2-2, 3-1, and 3-2 were determined from the monthly fuel oil throughput and fuel oil sulfur content. The combustion turbines are not equipped with a continuous emissions monitoring systems (CEMS) and no stack emission tests have been performed on the units.

Emissions of NO_x, PM_{10}, $PM_{2.5}$, and CO were estimated in accordance with EPA's Compilation of Air Pollutant Emission Factors, Volume I, Stationary Point and Area Sources, Chapter 3.1 (AP-42 3.1) and the recorded monthly fuel throughput. It was assumed that all PM was $PM_{2.5}$ and therefore baseline PM_{10} emissions are the same as $PM_{2.5}$. SO_2 emissions were quantified by mass balance from the monthly fuel throughput and sulfur content assuming that 100 percent of the sulfur was oxidized to SO_2. H_2SO_4 emissions are based upon 10 percent conversion of SO_2 to H_2SO_4. Emissions of GHGs are based upon the global warming potentials and emission factors in 40 CFR §98, Subpart A, Table A-1 and 40 CFR §98, Subpart C, Tables C-1 and C-2. Detailed emission calculations are provided in Appendix B including potential emission estimates for Hazardous Air Pollutants (HAP's).

From the information provided in Appendix B, PREPA selected a 24-month period consecutive from May 2016 through April 2018 for all pollutants, which is well within the 10-year period preceding the submittal of this application. The calculated baseline emissions of NO_x, PM_{10}, $PM_{2.5}$, CO, SO_2, H_2SO_4, and GHGs for units PSGT 2-2, 3-1, and 3-2 are provided in Table 2 and documented in the Appendix B.

Table 2: Baseline Actual Emissions for Units PSGT 2-2, 3-1, and 3-2

Pollutant	Baseline Actual Emissions (tpy)	24-Month Consecutive Period
NO_x	718.4	May 2016 through April 2018
$PM_{10}/PM_{2.5}$	9.8	May 2016 through April 2018
CO	2.7	May 2016 through April 2018
SO_2	19.8	May 2016 through April 2018
H_2SO_4	3.04	May 2016 through April 2018
GHGs (as CO_2e)	133,596	May 2016 through April 2018

The baseline emissions presented in Table 2 will be creditable and contemporaneous reductions in emissions with the project.

Net Emissions Increase

Table 3: Significant Net Increase In Emissions Test

Pollutant	Project Total Potential (tpy)	Reduction In Emissions (tpy)	Project Net Increase in Emissions (tpy)	PSD Significance Threshold (tpy)
NO_x	196.3	718.4	-522.1	40
PM_{10}	19.7	9.8	9.9	15
$PM_{2.5}$	19.7	9.8	9.9	10
CO	101.7	2.7	99.0	100
SO_2	55.8	19.8	36.0	40
H_2SO_4	8.55	3.04	5.51	7
GHGs (as CO_2e)	181,494	133,596	47,898	75,000

The net emissions increase summary in Table 3 demonstrates that the project will not result in a significant net increase in emissions of NO_x, PM_{10}, $PM_{2.5}$, CO, SO_2, H_2SO_4, or GHGs.

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NSR Applicability Conclusion

The project constitutes a modification of an existing major NSR source. In accordance with 40 CFR §52.21(a)(2)(iv)(a), the project would be a major modification if it causes two types of emissions increases, a significant emissions increase (as defined in 40 CFR §52.21 (b)(40)), and a significant net emissions increase (as defined in 40 CFR §52.21(b)(3) and 40 CFR §52.21(b)(23)). As the project will only include new emission sources, an emissions increase evaluation was carried in accordance with 40 CFR §52.21(a)(2)(iv)(d), which is an actual-to-potential test. The emissions increase evaluation showed that there would be a significant increase in emissions of NO_x, PM_{10}, $PM_{2.5}$, CO, SO_2, and GHGs but not for PM, VOC, and H_2SO_4. A net increase in emissions evaluation was then performed for NO_x, PM_{10}, $PM_{2.5}$, CO, SO_2, and GHGs. The net increase in emissions evaluation included the creditable contemporaneous reduction in emissions that will occur due to the shutdown of units PSGT 2-2, 3-1, and 3-2. The net increase in emissions evaluation demonstrated that there will not be a significant net increase in emissions of NO_x, PM_{10}, $PM_{2.5}$, CO, SO_2, and GHGs. Therefore, the project will not result in a significant emissions increase and a significant net emissions increase for any NSR regulated pollutant and therefore NSR permitting is not triggered.

DNER / EQB Construction Permit Process and Proposed Federally Enforceable Emissions

PREPA is submitting this application to obtain a permit to construct for the three proposed combustion turbines and BSGs. The Increase in Emissions and Net increase in Emissions tests provided above are based upon emission limitations for the proposed new combustion turbines and a limit on operating hours for the BSGs. PREPA is proposing to make these operating and emission limitations federally enforceable in the construction permit to satisfy the requirements of 40 CFR §52.21(b)(4).

As part of this permitting process, PREPA requests that the DNER / EQB impose annual mass-based emission limits for NO_x, CO, VOCs, SO_2, H_2SO_4, PM, PM_{10}, $PM_{2.5}$ on the three new peaking turbines in the permit. Table 4 summarizes the proposed annual emission limits for the peaking turbines.

Table 4: Proposed Emission Limits On Peaking Turbines

Pollutant	Combustion Turbine Potential (tpy)
NO_x	191.3
PM	19.57
PM_{10}	19.57
$PM_{2.5}$	19.57
CO	99.45
VOC	7.85
SO_2	55.8
H_2SO_4	8.55
GHGs	180,889

fr

The operating hours for each BSG will be limited to no more than 500 hours per rolling 12-month period, which will limit their emissions to the level presented in Table 1. The proposed limits presented in Table 4 are for all three turbines combined and based upon fuel heat contents of 1,020 Btu per cubic foot of natural gas and 138,000 Btu per gallon of distillate oil.

Regulatory Applicability Analysis and Compliance Evaluation

In accordance with RCAP Rule 203(B)(1), the source shall be able to comply with all applicable rules and regulations. Following is a review of applicable EPA and EQB regulations that may be applicable to the proposed combustion turbines.

40 CFR 60 – New Source Performance Standard (NSPS) Subpart KKKK – Stationary Gas Turbines

NSPS Subpart KKKK is applicable to stationary gas turbines with a rated heat input greater than 10 MMBtu/hr that commenced construction, reconstruction, or modification after February 18, 2005. The proposed combustion turbines will be subject to NSPS Subpart KKKK.

NSPS Subpart KKKK imposes limits on emissions of NO_x and SO_2. The applicable emission limits for combustion turbines with a rated heat input between 50 and 850 MMBtu/hr is summarized in Table 5.

Table 5: Applicable Emissions Limits Under NSPS Subpart KKKK

Fuel	NO_x	SO_2
Natural Gas	25 parts per million at 15 percent O_2 (ppmvdc) or 1.2 pounds per megawatt-hour (lb/MWh) of useful output	6.2 lb/MWh gross output, or a fuel sulfur content with potential SO_2 emission not greater than 0.42 lb/MMBtu.
Distillate Oil	74 ppmvdc or 3.6 lb/MWh	

The combustion turbines will be equipped with water injection to control NO_x emissions below the applicable limits. For natural gas firing, it is expected that the proposed turbines will meet the alternate NO_x limit of 1.2 lb/MWh of useful output where useful output is defined under 40 CFR §60.4420 as "the gross useful work performed by the stationary combustion turbine system. For units using the mechanical energy directly or generating only electricity, the gross useful work performed is the gross electrical or mechanical output from the turbine/generator set." The turbines will meet the 74 ppmvdc limit for distillate oil firing. The turbines will be equipped with a continuous water to fuel ratio monitoring system meeting the requirements of 40 CFR §60.4335(a).

The natural gas will have a maximum sulfur content of 5 grains per 100 cubic feet, equivalent to a potential SO_2 emission rate of 0.014 lb/MMBtu. The distillate oil will have a maximum sulfur content of 0.05 percent by weight, equivalent to a potential SO_2 emission rate of 0.0505 lb/MMBtu. These potential SO_2 emission rates are well below the applicable fuel sulfur standard

40 CFR 60 – NSPS Subpart TTTT – Greenhouse Gas Emissions for Electric Generating Units

NSPS Subpart TTTT is applicable to CTGs with a fuel firing rate above 250 MMBtu/hr or a generating output above 25 MW that commences construction or reconstruction after January 8, 2014. The proposed combustion turbines will be subject to NSPS Subpart TTTT.

A natural gas-fired combustion turbine with an annual capacity factor (on a three-year rolling basis) below its "design efficiency," is not subject to the output based standards (lb CO_2/MWh) of NSPS Subpart TTTT. The "design efficiency" value for the proposed combustion turbines when firing natural gas at full load is 35.8% based upon a heat rate of 9,532 Btu per kilowatt-hour (gross lower heating value). PREPA proposes to limit the annual capacity factor of each combustion turbine to 35.8% on a rolling 3-year average. As multi-fuel units exempt from the output based standards, the combustion turbines can be operated up to a 50% capacity factor in any 12-month period as long as the three year rolling average is below 35.8%.

Under Subpart TTTT, multi-fuel combustion turbines that are not subject to the output based emission standards must comply with a mass-based standard, which is expressed in the units of lbs of CO_2 per MMBtu heat input (lb CO_2/MMBtu). For units that fire natural gas and distillate oil, compliance is demonstrated on a sliding scale standard based upon emissions of 120 lb CO_2/MMBtu for natural gas firing and 160 lb CO_2/MMBtu for distillate oil. In accordance with 40 CFR §60.5525(a)(2), Equation 1, the firing of natural gas and distillate oil will always be in compliance with these mass based emission standards.

40 CFR 63 – National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart YYYY – Stationary Combustion Turbines

NESHAP Subpart YYYY establishes emission limitations and operating limitations for HAP emissions from combustion turbines located at major sources of HAP emissions. The Facility is a major source of HAP emissions and therefore the proposed combustion turbines will be subject to NESHAP Subpart YYYY. The proposed combustion turbines will meet the definition of *diffusion flame oil-fired stationary combustion turbines* as they are capable of firing both natural gas and distillate oil and the existing and proposed combustion turbines fire oil more than an aggregate total of 1000 hours during the calendar year. NESHAP Subpart YYYY limits the concentration of formaldehyde in the combustion turbine exhaust to 91 parts per billion by volume dry at 15 percent oxygen. The combustion turbines will meet this limit through good combustion controls without the need for an oxidation catalyst. PREPA will operate the turbines in accordance with manufacturer recommendations to demonstrate continuous compliance in accordance with 40 CFR 63.6140(a).

RCAP Rule 403 – Visible Emissions

The CTGs will meet the Rule 403 visible emission limit of opacity no greater than 20 percent (6-minute average) except an opacity up to 60 percent for a period of no more than four minutes in any consecutive thirty (30) minute interval during the firing of distillate oil and natural gas.

RCAP Rule 405 – Particulate Matter Emissions

Rule 405 limits particulate matter (PM) emissions (filterable) to no greater than 0.30 pounds per million BTU when firing liquid fuel. The filterable PM emissions from the combustion turbines will be well below this limit.

RCAP Rule 410 – Fuel Sulfur Content

The fuel sulfur content of the fuels fired in the CTGs will be limited to 0.05 percent by weight for distillate oil and 5 grains per 100 standard cubic feet of natural gas (approximately 0.015 percent by weight) per the following equation.

$$Natural\ Gas\ Sulfur\ (wt\%) = \left(\frac{5\ grains\ S}{100\ standard\ ft^3}\right) X \left(\frac{385.3\ standard\ ft^3}{lb - mole\ gas}\right) + MW\ \left(\frac{1\ lb - mole}{17.5\ lbs\ gas}\right) X \left(\frac{1\ lb}{7{,}000\ grains}\right) X\ 100$$

RCAP Rule 412 – SO_2 Emissions

Rule 412 limits SO_2 emissions to no greater than 1,000 ppm by volume at 21% oxygen from any emission source. The SO_2 emissions from the CTGs when firing distillate oil, the fuel with the highest sulfur content, will have stack emissions of approximately 32 ppm by volume in the stack at 15% oxygen per the following equation from 40 CFR 60, Appendix B, Method 19.

$$SO2\ (ppmvd\ @21\%\ O2) = \left(\frac{0.0505\ lb}{MMBtu}\right) X\ Fd \left(\frac{1\ MMBtu}{9{,}190\ dscf}\right) X\ EPA\ Method\ 19, Table\ 19 - 1\ factor \left(\frac{1}{1.660\ x\ 10^{-7}}\right)$$

Respectfully, PREPA submits for DNER/EQB's evaluation this Application for a Permit to Construct the proposed dual fuel combustion turbines at Central Palo Seco. PREPA welcomes the opportunity to discuss and respond to any questions that you may have.

Cordially,

Luisette X. Ríos Castañer, Head
Environmental Protection and
Quality Assurance Division

THIS IS WATERMARK PAPER - DO NOT ACCEPT WITHOUT NOTING WATERMARK - HOLD TO LIGHT TO VERIFY WATERMARK

Puerto Rico Electric Power Authority

CITIBANK, N.A. –CSMG
GENERAL FUND

CHECK NO. 472218
DATE 20–DEC–19

PAY One Thousand Fifty–Five And 85/100 Dollars ***********$1,055.85

TO THE ORDER OF

SECRETARIO DE HACIENDA
JUNTA DE CALIDAD AMBIENTAL
PO BOX 11488
SAN JUAN, PR 00910-1488

José A. Ortiz Torres
Dalys Sánchez Serrano

NOT VALID AFTER THREE MONTHS FROM DATE OF ISSUE

⑈00472218⑈ ⑆021502040⑆ 04000150151⑈

Puerto Rico Electric Power Authority

CITIBANK CSMG – GENERAL FUND

Vendor Number	Date	Check No.
00498715	20–DEC–19	472218

Date	Invoice	Description	Gross	Withheld Amount	Discount	Net
13–DEC–19	19–12–CM–004	SOLICITUD DE PERMISO DE CONSTRUCCION PARA TUR	1,055.85	0.00	0.00	1,055.85
4961 Jose						
THE ATTACHED CHECK IS IN PAYMENT FOR ITEMS DESCRIBED ABOVE		**TOTAL**	1,055.85	0.00	0.00	1,055.85

Appendices

Appendix A: Application Permit for the Construction or Operation of Sources of Emission in Puerto Rico

Appendix B: Supporting emission calculations documentation to support NSR Applicability Analysis, including Project Potential Emissions and Baseline Actual Emissions. Includes potential estimates for Hazardous Air Pollutants - HAP's

Appendix C: Copy of Approved Environmental Evaluations (Rule 141)

Appendix D: DNER Emergency Waiver for the Installation of (3) Combustion Turbines at Palo Seco

Appendix E: Black Start Generator Manufacturer's Emissions Certification

Appendix F: Site and Project Figures

Appendix A:

Application Permit for the Construction or Operation of Sources of Emission in Puerto Rico

GOBIERNO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

PUERTO RICO VERDE

Área de Calidad de Aire

DOCUMENTOS A SOMETERSE PARA PROYECTOS
POR LEY DE CERTIFICACIÓN O POR PROCESO ORDINARIO

FORMULARIO DE RADICACIÓN

San Juan P.R.
de ______ de 2019.

PFE______________________

HOJA DE COTEJO

Para someter formularios de permiso de construcción u operación bajo el proceso ordinario y bajo las disposiciones del Reglamento para la Certificación de Planos y Documentos ante la Junta de Calidad Ambiental.

Ley de Certificación Ingeniero	Arquitecto	**Ordinario** Químico	JCA	
✓	☐	☐	☐	Original y copia del permiso para Construir u Operar Fuente de Emisión en Puerto Rico, firmado y sellado por un Ingeniero, Arquitecto o Químico Licenciado practicando la profesión en Puerto Rico.
✓	☐	☐	☐	Evidencia de haber cumplido con el Artículo 4B(3) de la Ley 416 del 22 de septiembre de 2004, según enmendada (Ley de Política Pública Ambiental) para la fuente de emisión a construirse. **(Rule 141)**
N/A	☐	☐	☐	Certificación de remoción de asbesto y plomo para los proyectos que contengan demolición de estructura.
✓	☐	☐	☐	Dos (2) copias de planos de localización.
✓	☐	☐	☐	Especificaciones de la fuente de emisión y medidas de control.
✓	☐	☐	☐	Original y copia de los cálculos de emisiones. **(Appendix B)**
✓	☐	☐	☐	Evidencia de haber cumplido con la cuotas del Colegio correspondiente (CIAPR, CAAPPR, CQPR).
✓	☐	☐	☐	Cumplir con la Regla 501 del Reglamento para el Control de la Contaminación Atmosférica (cargos por radicación y permiso).
✓	☐	☐	☐	Dos (2) copias del estimado de costo de la obra a construirse, detallado y desglosado.
N/A	☐	☐	☐	Evidencia o presentación de comprobante y sellos para cancelar: 1- Sellos CIAPR por la cantidad de: ________. 2- Comprobante de Rentas Internas por la cantidad de: ________.
☐	☐	☐	✓	Evidenciar copia de los Permisos de las Agencias Gubernamentales que tienen jurisdicción con el caso **(Waiver (Dispensa), Rule 141)**

EFRAN PAREDES MAISONET
INGENIERO LICENCIADO
LIC. #17776
PUERTO RICO

____
(Representante autorizado JCA)

Eng. Efran Paredes Maisonet
(Firma y sello Ingeniero, Químico o Arquitecto licenciado)

Dirección Física: Edificio de Agencias Ambientales Cruz A. Matos, San José Industrial Park,
1375 Avenida Ponce de León, San Juan, Puerto Rico 00926-2604
Dirección Postal: Apartado 11488, San Juan, PR 00910
Tel. (787) 767-8181 • Fax (787) 756-5906

GOBIERNO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

PUERTO RICO VERDE

Área de Calidad de Aire

SOLICITUD DE PERMISO PARA LA CONSTRUCCIÓN U OPERACIÓN DE FUENTES DE EMISIÓN EN PUERTO RICO

PARTE I - INFORMACION GENERAL

( ) Primero ( ) Revisión ( ) Renovación (X) Modificación ( ) Temporal Fecha: December 17, 2019

1. Solicitante:
   A. Nombre de la fuente de emisión: Autoridad de Energía Eléctrica de Puerto Rico (AEE o PREPA)
   B. Teléfono: 787-521-4960 SS Patronal: 66-043374
   C. Localización: PR-165 Km 30.8, Toa Baja, PR 00949
   D. Dirección Postal: PO Box 364267 San Juan. P.R. 00936-4267

E. Oficial Responsable: Autoridad de Energia Electrica de Puerto Rico
Daniel Hernández Morales Organización

Ing. Daniel Hernández	Director de Generación	787-521-6421
Nombre del Oficial Responsable	Título	Teléfono

Correo Electrónico:
Dirección Postal: PO Box 364267, San Juan. P.R. 00936-4267

2. Propósito de la solicitud: (X) Construcción ( ) Operación (marque sólo una)
3. Naturaleza de la actividad: Installation of 3 PWPS Model FT8 MOBILPAC Peaking Combustion Turbines (Dual fuel Turbines, Gas Natural y Diesel) and 3 Caterpillar Model C13 black start generator engines
4. Número de empleos directos a crear: 147 Número de empleos indirectos a crear: 74
5. Número de empleos retenidos:
6. Costo de inversión capital: $58,093,016
7. Producción anual máxima (especifique unidad):
8. Horario máximo de operación: 24 Horas/día 7 Días/semana 12 Meses/año
9. Si es operación intermitente, frecuencia máxima: SIC: 4911 (Código de Clasificación Industrial)
10. Se deben incluir los siguientes documentos:
    A. Plano de localización (proyectado o existente) indicando colindancias adyacentes y estructuras.
    B. Plano de la facilidad (proyectado o existente) indicando todos los puntos de emisión.
    C. Certificación del solicitante autorizando al representante (si aplica).
11. Anote todos los permisos otorgados por alguna agencia federal, estatal o local para la estructura o construcción, permiso de uso o número requerido:

Tipo de Permiso	Agencia	No. de Identificación	Fecha
PFE Tíulo V	DNER/EQB JCA	PFE-TV-4911-70-1196-0015	March 16, 2015
Rule 141	DNER/EQB	141-19-0538	November 04, 2019
Categorical exclusion	OGPe	2019-268588-DEC-077849	June 26, 2019

12. Esta instalación, existía o fue construida legalmente antes del 16 de septiembre de 1971?
    ( ) sí (X) no (marque sólo una)

CERTIFICACION

La presente solicitud se somete con el propósito de obtener autorización para la actividad aquí descrita. Certifico que, a mi mejor conocimiento y creencia, toda la información es correcta, completa y exacta.

Firma del Oficial Responsable

AFFIDAVIT

Affidavit No. 830

Jurado y suscrito ante mí por Daniel Hernández Morales oficial responsable de AEE mayor de edad, status civil Casado y residente de Bayamón, PR. En San Juan, Puerto Rico, hoy día 18 de diciembre de 2019.

Notario Público

EXENTO PAGO ARANCEL LEY 47 DE JULIO 1982

VAZQUEZ RODRIGUEZ ABOGADA NOTARIO PUERTO RICO

SOLO PARA USO DE LA JUNTA DE CALIDAD AMBIENTAL

Permiso otorgado en ______ Expira ______ No. solicitud ______

GOBIERNO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

PUERTO RICO VERDE

Área de Calidad de Aire

SOLICITUD DE PERMISO PARA LA CONSTRUCCIÓN U OPERACIÓN
DE FUENTES DE EMISIÓN EN PUERTO RICO

PARTE II - PROCESO DE LA PLANTA Y DESCRIPCIÓN DE EMISIONES

I. EMISIONES INDUSTRIALES: (Movimiento de terreno, almacenaje en tanques, talleres de pintado, etc.)

1. Descripción del proceso u operación que emite contaminantes atmosféricos:
N/A

2. Materia prima usada o procesada: ______ Tipo ______ Cantidad ______ (unidad/unidad tiempo)

3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
pies	pulg.	°F	pies/seg.
pies	pulg.	°F	pies/seg.

5. Volumen de descarga de emisiones: ______ Pies^3/min.
6. Emisiones actuales: Estimado basado en: ______.

Tipo de contaminante	Cantidad (masa/tiempo)	Duración (tiempo/unidad tiempo)

7. Incluya un diagrama de flujo del proceso (tipo bloque) demostrando puntos, cantidades y tipos de emisiones.

II. EMISIONES POR COMBUSTIÓN: (Calderas, calentadores, plantas de emergencia, bombas de incendio, etc.)

1. Equipo de combustión: PWPS Model FT8® MOBILEPAC combustion turbines: 294.8 MMBtu/hr per Nat. Gas: 283.3 MMBtu/hr per Oil.
Tipo BTU/hr HP

2. Combustible:

Tipo	Gal/hr	ó Lb/hr	% azufre
Natural Gas	289,029 scf/hr		5.0 gr/100 dscf
Distillate Oil	2,053 gal/hr		0.05 wt%

3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso
Water Injection (gas)	85
Water Injection (oil)	85

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
33.9 pies	120.95" x 97.08" pulg.	794 °F	157.4 pies/seg.
33.9 pies	120.95" x 97.08" pulg.	794 °F	155.4

III. EMISIONES POR INCINERACIÓN O DISPOCISIÓN DE DESPERDICIOS: (Sólidos, líquidos, gaseosos)

1. Método para disponer los desperdicios: N/A.
2. Tipo de desperdicios: ______ Cantidad: ______ Lb/día.
3. Incinerador: ______ Tipo ______ Marca ______ Capacidad (Lb/día).
4. Chimenea: ______ Pies ______ Pies ______ °F ______ Pies/seg.
Altura Diámetro Salida Temp. Salida Velocidad Salida
5. Combustible auxiliar: Tipo Gal/hr ó Lb/hr % azufre

6. Equipo de control: ______ Tipo ______ Eficiencia % por peso.

IV. CUMPLIMIENTO: Incluya datos o información demostrando que las emisiones no exceden los límites establecidos.
V. EQUIPO DE CONTROL: Incluya esquema de la instalación del equipo de control de la fuente de emisión.

CERTIFICACIÓN DE UN INGENIERO, QUÍMICO O ARQUITECTO LICENCIADO

Certifico que estoy registrado y autorizado para practicar mi profesión en Puerto Rico; que el equipo y medidas para el control de emisiones son adecuadas y cumplen con las disposiciones del Reglamento de Control de Contaminantes Atmosféricos de la Junta de Calidad Ambiental de Puerto Rico y que, de acuerdo a mis mejores conocimientos y creencias, la información suministrada es veraz, completa y exacta.

17776 — Número de Licencia
Efran Paredes — Nombre (Letra de molde)
Firma

EFRAN PAREDES MAISONET INGENIERO LICENCIADO LIC. #17776 PUERTO RICO

Fecha: ______. Número de solicitud: ______.

GOBIERNO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

Área de Calidad de Aire

PUERTO RICO VERDE

HOJA DE PAGO

Número de Solicitud: ______
Nombre del Oficial Responsable: Ing. Daniel Hernández
Título: Director de Generación
Nombre del Proyecto o Fuente de Emisión: ______
Dirección Postal: ______

I. Pago por Solicitud de Permiso:
1. Pago por Radicación ($100.00): (X) Construcción ( ) Operación
( ) Escuela de Adiestramiento de Asbesto
2. ( ) Pago por Permiso 3. ( ) Pago por Renovación 4. ( ) Pago por Modificación

$100.0

($10.00 por toneladas por Contaminante)

CONTAMINANTE	EMISIONES (Ton/año)	CARGO TOTAL
Material Particulado (PM_{10})		
Dióxido de Azufre (SO_x)		
Oxido de Nitrógeno (NO_x)		
Compuestos Orgánicos Volátiles (VOC) e Hidrocarburos (HC)	6.9	$69.12
Plomo (Pb)		
Otros (CO)	88.7	$886.73
TOTAL		$1,055.85

CERTIFICACIONES DE ASBESTO

1. Escuela de Adiestramiento de Asbesto $600.00		N/A
2. Registro de Asbesto ($40.00 por categoría) ( ) Especialista en Muestreo de Aire ( ) Diseñador de proyecto ( ) Planificador de proyecto ( ) Inspector ( ) Supervisor ( ) Trabajador		

OTROS CARGOS

1. Cambio de dueño o localización	(50% del cargo por radicación)	N/A
2. Pago por Revisión	(50% del cargo por radicación)	N/A
3. Duplicados de Permisos	$10.00	N/A
4. Pago por Exceso de Emisiones:		
A. Dispensas	($25.00/ton/contaminante)	N/A
B. Pequeños Negocios	($12.50/ton/cantaminante)	N/A

PAGO TOTAL DE LA SOLICITUD:

II. Pago anual (pago por un año) N/A
III. Pago por cuatro (4) años extras (pago por 4 años) N/A
IV. TOTAL $1,055.85

PARA COMPLETARSE EN LA OFICINA DEL ÁREA DE CALIDAD DE AIRE

Cantidad a pagar: ______ Fecha: ______ Recibido por: ______

Número de cheque: ______ Número de recibo: ______

Firma del Representante autorizado JCA

Firma División de Finanzas

Dirección Física: Edificio de Agencias Ambientales Cruz A. Matos, San José Industrial Park,
1375 Avenida Ponce de León, San Juan, Puerto Rico 00926-2604
Dirección Postal: Apartado 11488, San Juan, PR 00910
Tel. (787) 767-8181 • Fax (787) 756-5906

PERMIT FEE CALCULATION

Pollutant	Tons Per Year			Difference	Fee
	PSGT Per Unit	PSGT 1-1, 1-2, and 2-1	Project		
PM10	15.85	47.54	19.70	-27.84	$0.00
SO2	666.89	2000.66	55.83	-1944.84	$0.00
NOx	1162.10	3486.30	196.27	-3290.04	$0.00
VOC	0.54	1.62	8.54	6.91	$69.12
CO	4.36	13.07	101.75	88.67	$886.73
TOTAL					$955.85

EFRAN PAREDES MAISONET
INGENIERO
LICENCIADO
LIC. #17776
PUERTO RICO

RENOVACIÓN APROBADA: 16 de noviembre, 2015

RENEWAL APPROVED ON: November 16, 2015

NÚM. EMP. 11964

Estado Libre Asociado de Puerto Rico
Commonwealth of Puerto Rico

DEPARTAMENTO DE ESTADO
Department of State

Secretaría Auxiliar de Juntas Examinadoras
Office of the Assistant Secretary of State for Examining Boards

La Junta Examinadora de Ingenieros y Agrimensores
The Examining Board of Engineers and Land Surveyors

por la presente certifica que
hereby certifies that

Efran Paredes Maisonet

habiendo cumplido todos los requisitos de Ley, se ha inscrito en el Registro de esta Junta como
having met all the requirements of law, has been registered as:

Ingeniero Licenciado
Licensed Engineer

16 FEB 16 AM 9:08

En testimonio de lo cual, se expide esta licencia para el ejercicio de dicha profesión, bajo el sello de la Junta Examinadora.
In testimony whereof, this license is issued to practice this profession, under the seal of the Board of Examiners.

En San Juan, Puerto Rico, efectivo 15 de diciembre de 2015
In San Juan, Puerto Rico, effective December 15, 2015.

Número de Licencia: 17776
License Number

Vencimiento: 15 de diciembre de 2020
Expires: December 15, 2020

JUNTA EXAMINADORA DE INGENIEROS Y AGRIMENSORES
ESTADO LIBRE ASOCIADO DE PUERTO RICO
DEPARTAMENTO DE ESTADO

Presidente

Secretario Auxiliar Lcdo. Francisco Rodríguez Bernier
Under Secretary

Certifico que es copia fiel y exacta del original.

Sonia Miranda Vega, Directora
Planificación y Protección Ambiental
Núm. Emp. 9218, Tel. 4884

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Rev. 11/17

GOBIERNO DE PUERTO RICO
Autoridad de Energía Eléctrica de Puerto Rico

18 de diciembre de 2018

Luisette X. Rios Castañer, Jefe
División de Protección Ambiental

Jaime A. Umpierre Montalvo, Jefe
División de Ingeniería y Servicios Técnicos

Desgloce de Costos para Solicitud Permiso de Construcción – Proyecto MegaGens Central Palo Seco

La Autoridad de Energía Eléctrica contrató mediante un proceso competitivo a la compañía ARG Precision Corp, para el diseño, compra, instalación y puesta en servicio de tres turbinas aeroderivadas, combustible dual (diésel y gas natural), móviles, de 27 MW, modelo Mobilepac FT8, manufacturado por PW Power Systems. El contrato fue por $58,093,016, cantidad que se distribuye en las siguientes partidas:

Major Equipments (Aeroderivative Turbines)	$50,501,543.04
Balance of Plant (BOP) Equipments	$3,485,580.96
Design	$180,000
Management & Administration	$700,000
Installation & Commissioning	$3,030,373.94
Taxes	$195,518.06

Para información adicional o aclaración de dudas favor de llamarnos a la extensión 6541.

JAIME A. UMPIERRE
INGENIERO LICENCIADO

Lic. 12789

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INGENIERO LICENCIADO

LK; 12789

Appendix B:

Supporting Emission Calculations

PREPA Palo Seco - Pratt & Whitney FT-8 Allowable Operation To Net Out of PSD

Pollutant	PSGT 2-2, 3-1, and 3-2 Baseline Emissions (tpy)	BSG Potential Emissions (tpy)	PSD Significance (tpy)	PW FT8 Allowable Emissions (tpy)	PW FT8 Emissions Gas (lb/MMBtu)	PW FT8 Allowable Gas (MMBtu/yr)	PW FT8 Emissions Oil (lb/MMBtu)	PW FT8 Allowable Oil (MMBtu/yr)
NOx	718.4	4.92	40	753.4	0.1100	13,698,316	0.1731	8,704,880
PM	9.8	0.131	25	34.6	0.010	6,793,487	0.0177	3,905,707
PM10	9.8	0.131	15	24.6	0.010	4,828,092	0.0177	2,775,763
PM2.5	9.8	0.131	10	19.6	0.010	3,845,394	0.0177	2,210,791
SO2	19.8	0.004	40	59.7	0.0140	8,532,314	0.0505	2,365,394
VOC	0.33	0.14	40	40.1	0.0051	15,620,658	0.0071	11,263,804
CO	2.69	2.29	100	99.4	0.0767	2,593,341	0.0343	5,796,061
H2SO4	3.04	0.001	7	9.99	0.0021	9,316,279	0.0077	2,582,731
GHGs	133,596	481	75,000	208,115	117.12	3,553,938	163.64	2,543,553

NOTES:

PW FT8 Allowable Emissions (tpy) are equal to baseline emissions for PSGT 2-2, 3-1, and 3-2 plus PSD Significance Threshold

PW FT8 Emissions (lb/MMBtu) are based upon PW FT8 performance data at 85°F

PW FT8 Allowable (MMBtu/yr) based upon allowable emissions (tpy) and emission rates (lb/MMBtu) for each pollutant

PW FT8 Allowable (hr/yr) are total hours for all three proposed PW FT8 Turbines based on allowable MMBtu/yr and 294.8 MMBtu/hr gas firing and 283.3 MM Btu/hr oil firing

Natural gas sulfur content limited to 5 grains per 100 standard cubic feet of gas

Distillate oil sulfur content limited to 0.05 percent by weight

GHGs are based upon the global warming potentials and emission factors in 40 CFR §98, Subpart A, Table A-1 and 40 CFR §98, Subpart C, Tables C-1 and C-2.

EFRAN PAREDES MAISONET
INGENIERO LICENCIADO
LIC. #17776
PUERTO RICO

12/16/2019

Palo Seco Combustion Turbine Project Potential Emissions Versus PSD Significance Thresholds

Pollutant	Combustion Turbine Potential (tpy)	BSGs Potential (tpy)	Natural Gas Handling Potential (tpy)	Project Total Potential (tpy)	PSD Significance Threshold (tpy)
NO_x	191.34	4.922	0	196.3	40
PM	19.57	0.109	0	19.7	25
PM_{10}	19.57	0.131	0	19.7	15
$PM_{2.5}$	19.57	0.131	0	19.7	10
CO	99.45	2.292	0	101.7	100
VOC	7.85	0.136	0.55	8.54	40
SO_2	55.82	0.004	0	55.8	40
H_2SO_4	8.55	0.001	0	8.55	7
GHGs (as CO2e)	180,889	481	124	181,494	75,000

EFRAN PAREDES MAISONET
INGENIERO LICENCIADO
LIC. #17776
PUERTO RICO

Future Potential Emissions - Palo Seco Power Plant														
Pollutant	Emissions From PSGT 1-1, 1-2, and 2-1			Emissions From New FT8 Combustion Turbines				Emissions From New FT8 Combustion Turbines	Emissions From New BSGs	Emissions From Units 1-4			Emergency Engines	Total Power Plant Emissions
	AP-42 04/00 - GT Fuel Oil Table 3.1-4 for Organics Fuel Sample Metals			Vendor Specs Criteria Pollutants. AP-42 04/00 - Oil Table 3.1-4 for Organic HAPs. Fuel Sample Metal HAPs		Vendor Specs Criteria Pollutants. AP-42 04/00 - Gas Table 3.1-3 for Organic HAPs.				AP-42 09/98 - No. 6 Oil Combustion Table 1.3-9 and 1.3-11 No. 6 Fuel Oil Sample for Metals				
	ppm	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	ton/yr	ton/yr	ppm	lb/MMBtu	ton/yr	ton/yr	(ton/yr)
NOx		8.8E-01	3,486.3	1.73E-01	191.3	1.10E-01	142.6	191.34	4.92		0.2133	3,811.6	9.85	7,499.1
CO		3.3E-03	13.1	3.43E-02	37.9	7.67E-02	99.5	99.45	2.29		0.0333	595.6	3.06	711.2
VOC		4.1E-04	1.6	7.10E-03	7.85	5.13E-03	6.7	7.85	0.14		0.0051	90.5	0.55	100.6
PM		0.012	47.5	0.0177	19.6	0.010	13.2	19.57	0.13		0.0521	930.9	0.24	998.2
PM10		0.012	47.5	0.0177	19.6	0.010	13.2	19.57	0.13		0.0470	839.6	0.23	907.0
PM2.5		0.012	47.5	0.0177	19.6	0.010	13.2	19.57	0.13		0.0470	839.6	0.23	907.0
SO2		5.05E-01	2,000.7	5.05E-02	55.82	1.40E-03	1.8	55.82	0.004		0.5423	9,689.9	1.32	11,747.7
H2SO4		7.73E-02	306.4	7.73E-03	8.55	2.14E-04	0.3	8.55	0.001		8.30E-02	1,483.8	0.20	1,798.9
GHGs as CO2e		163.64	648,300	163.64	180,889	117.12	151,864	180,889	481.0		1.66E+02	2,968,700	584	3,798,472
1,1,1-Trichloroethane											1.57E-06	2.81E-02		2.81E-02
1,3-Butadiene		1.60E-05	6.34E-02	1.60E-05	1.77E-02	4.30E-07	5.58E-04	1.77E-02					3.77E-05	8.11E-02
Acenaphthene									1.38E-05		1.41E-07	2.51E-03	1.35E-05	2.53E-03
Acenaphthylene									2.71E-05		1.69E-09	3.01E-05	2.89E-05	5.91E-05
Acetaldehyde						4.00E-05	5.19E-02	5.19E-02	7.41E-05				8.13E-04	5.27E-02
Acrolein						6.40E-06	8.30E-03	8.30E-03	2.32E-05				1.10E-04	8.41E-03
Anthracene									3.62E-06		8.13E-09	1.45E-04	5.03E-06	1.50E-04
Benzo(a)anthracene									1.83E-06		2.67E-08	4.78E-04	3.26E-06	4.81E-04
Benzene		5.50E-05	2.18E-01	5.50E-05	6.08E-02	1.20E-05	1.56E-02	6.08E-02	2.28E-03		1.43E-06	2.55E-02	2.92E-03	3.07E-01
Benzo(a)pyrene									7.55E-07				6.69E-07	6.69E-07
Benzo(b)fluoranthene									3.26E-06				2.89E-06	2.89E-06
Benzo(b,k)fluoranthene											9.87E-09	1.76E-04	1.64E-07	1.76E-04
Benzo(g,h,i)perylene									1.63E-06		1.51E-08	2.69E-04	1.92E-06	2.71E-04
Benzo(k)fluoranthene									6.41E-07				5.67E-07	5.67E-07
Chrysene									4.50E-06		1.59E-08	2.83E-04	4.32E-06	2.88E-04
Dibenzo(a,h)anthracene									1.02E-06		1.11E-08	1.99E-04	1.46E-06	2.00E-04
Ethylbenzene						3.20E-05	4.15E-02	4.15E-02			4.24E-07	7.58E-03		4.91E-02
Fluoranthene									1.18E-05		3.23E-08	5.77E-04	1.78E-05	5.94E-04
Fluorene									3.76E-05		2.98E-08	5.32E-04	6.13E-05	5.94E-04
Formaldehyde		2.31E-04	9.15E-01	2.31E-04	2.55E-01	2.19E-04	2.84E-01	2.84E-01	2.32E-04		2.20E-04	3.93E+00	1.36E-03	5.13E+00
Indeno(1,2,3-cd)pyrene									1.22E-06		1.43E-08	2.55E-04	1.44E-06	2.56E-04
Naphtalene		3.50E-05	1.39E-01	3.50E-05	3.87E-02	1.30E-06	1.69E-03	3.87E-02						1.77E-01
Total PAHs		4.00E-05	1.58E-01	4.00E-05	4.42E-02	2.20E-06	2.85E-03	4.42E-02	3.82E-04		8.67E-06	1.55E-01	5.02E-04	3.58E-01
OCDD											2.07E-11	3.69E-07		3.69E-07
Phenanathrene									1.20E-04		7.00E-08	1.25E-03	1.34E-04	1.38E-03
Propylene														
Pyrene									1.09E-05		2.83E-08	5.06E-04	1.43E-05	5.21E-04
Toluene						1.30E-04	1.69E-01	1.69E-01	8.26E-04		4.13E-05	7.39E-01	1.13E-03	9.08E-01
Xylene						6.40E-05	8.30E-02	8.30E-02	5.67E-04		7.27E-07	1.30E-02	7.82E-04	9.68E-02
Arsenic	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01

12/12/2019

Future Potential Emissions - Palo Seco Power Plant														
Pollutant	Emissions From PSGT 1-1, 1-2, and 2-1			Emissions From New FT8 Combustion Turbines				Emissions From New FT8 Combustion Turbines	Emissions From New BSGs	Emissions From Units 1-4			Emergency Engines	Total Power Plant Emissions
	AP-42 04/00 - GT Fuel Oil Table 3.1-4 for Organics Fuel Sample Metals			Vendor Specs Criteria Pollutants. AP-42 04/00 - Oil Table 3.1-4 for Organic HAPs. Fuel Sample Metal HAPs		Vendor Specs Criteria Pollutants. AP-42 04/00 - Gas Table 3.1-3 for Organic HAPs.				AP-42 09/98 - No. 6 Oil Combustion Table 1.3-9 and 1.3-11 No. 6 Fuel Oil Sample for Metals				
	ppm	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	ton/yr	ton/yr	ppm	lb/MMBtu	ton/yr	ton/yr	(ton/yr)
Antimony	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01
Beryllium	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	0.05	2.69E-06	4.80E-02	8.80E-06	6.05E-02
Cadmium	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	0.05	2.69E-06	4.80E-02	8.80E-06	6.05E-02
Chromium	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	4.00	2.15E-04	3.84E+00	8.80E-06	3.85E+00
Cobalt	0.10	4.93E-06	1.96E-02	4.93E-06	5.45E-03			5.45E-03	1.45E-05	0.30	1.61E-05	2.88E-01	1.76E-05	3.13E-01
Lead	0.20	9.87E-06	3.91E-02	9.87E-06	1.09E-02			1.09E-02	2.90E-05	5.00	2.69E-04	4.80E+00	3.52E-05	4.85E+00
Manganese	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	0.05	2.69E-06	4.80E-02	8.80E-06	6.05E-02
Mercury	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01
Nickel	0.10	4.93E-06	1.96E-02	4.93E-06	5.45E-03			5.45E-03	1.45E-05	10.8	5.80E-04	1.04E+01	1.76E-05	1.04E+01
Selenium	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01
Total HAPs		**4.70E-04**	**1.86**	**4.70E-04**	**0.52**	**5.06E-04**	**0.66**	**0.66**	**0.66**		**1.47E-03**	**26.27**		**28.79**
Maximum Individual HAP												**Nickel**		**10.39**

EFRAN PAREDES MAISONET
INGENIERO LICENCIADO
LIC #17776
PUERTO RICO

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Future Potential Emissions - Palo Seco Power Plant

Pollutant	Emissions From PSGT 1-1, 1-2, and 2-1: AP-42 04/00 - GT Fuel Oil Table 3.1-4 for Organics Fuel Sample Metals			Emissions From New FT8 Combustion Turbines: Vendor Specs Criteria Pollutants. AP-42 04/00 - Oil Table 3.1-4 for Organic HAPs. Fuel Sample Metal HAPs		Emissions From New FT8 Combustion Turbines: Vendor Specs Criteria Pollutants. AP-42 04/00 - Gas Table 3.1-3 for Organic HAPs.		Emissions From New FT8 Combustion Turbines	Emissions From New BSGs	Emissions From Units 1-4: AP-42 09/98 - No. 6 Oil Combustion Table 1.3-9 and 1.3-11 No. 6 Fuel Oil Sample for Metals			Emergency Engines	Total Power Plant Emissions
	ppm	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	ton/yr	ton/yr	ppm	lb/MMBtu	ton/yr	ton/yr	(ton/yr)

Fuel Type	Heat Content		Density lb/gal	Annual Firing Rate			
Distillate Oil (New GTs)	138,000	Btu/gal	6.81	16,020,227	gal/yr	2,210,791	MMBtu/yr
Natural Gas (New GTs)	1,020	Btu/cf	N/A	2,542	MMCF/yr	2,593,341	MMBtu/yr
Distillate Oil (Existing GTs	138,000	Btu/gal	6.81	57,416,087	gal/yr	7,923,420	MMBtu/yr
No. 6 Fuel Oil (Boilers)	150,000	Btu/gal	8.06	238,227,149	gal/yr	35,734,072	MMBtu/yr
Fuel Sulfur (new GTs)		0.05	%				
Fuel Sulfur (existing GTs)		0.50	%				
Fuel Sulfur (Boilers)		0.50	%				

Notes:

1) If results of fuel oil testing indicated that the concentration of a particular metal is below detectable limits, the metal concentration was set to one-half the lowest detectable level.
2) The facility-wide HAP potential emissions is based upon the maximum result by individual HAP and total HAPs for fuel oil and natural gas.
3) For distillate oil firing, PTE based upon existing permit limits, rated firing rate, and 8,760 hr/yr, as applicable.
4) For natural gas firing, PTE based upon vendor emission guarantee rated firing rate, and 8,760 hr/yr, as applicable
5) For natural gas firing, VOC and PM/PM10/PM2.5 emissions based on AP-42, Section 3.1, Table 3.1-1.
6) For natural gas firing, formaldehyde (HCOH) PTE based on vendor guarantee (91 ppbvd).
7) SO2 emissions based upon fuel sulfur content limits
8) HAP PTE, except for HCOH on gas for new CTGs, based on AP-42 Section 3.1, Tables 3.1-1, 3.1-3, 3.1-4, and 3.1-5.
9) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
10) CO2e emissions from 40 CFR 98, Subchapter C, Tables 1 and 2
11) Natural gas and distillate oil throughput limited to keep emissions below PSD signficance threshold.
12) Boilers 1 and 2 potential emissions based upon 8% annual capacity factor for limited use oil units under 40 CFR 63, Subpart UUUUU.

13) Fuel Oil F factor	9190	dsf/MMBtu
14) Natural Gas F factor	8710	dsf/MMBtu
15) From Method 19 - NOx	1.194E-07	lb/scf:ppm
16) From Method 19 - CO	7.270E-08	lb/scf:ppm

Rated Fuel Firing Rates FT8

Fuel Type	MMBtu/hr	
Distillate Oil	283.3	24-hr average
Natural Gas	294.8	24-hr average

1 lb = 7000 grains

EFRAN PAREDES MAISONET
INGENIERO LICENCIADO
LIC. #17776
PUERTO RICO

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Potential Emissions - Palo Seco Power Plant Black Start Engines

Pollutant	Emissions From BSG-PS-1 609 hp		Emissions From BSG-PS-2 609 hp		Emissions From BSG-PS-3 609 hp		Totals
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.675	1.641	1.675	1.641	1.675	1.641	4.922
CO	0.780	0.764	0.780	0.764	0.780	0.764	2.292
VOC	0.046	0.045	0.046	0.045	0.046	0.045	0.136
PM (filterable only)	0.0370	0.036	0.0370	0.036	0.0370	0.036	0.109
PM10	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
PM2.5	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
SO2	0.0015	0.001	0.0015	0.001	0.0015	0.001	0.004
H2SO4	0.0002	0.000	0.0002	0.000	0.0002	0.000	0.001
CO2e	163.64	160.3	163.64	160.3	163.64	160.3	481.0
1,1,1-Trichloroethane							
1,1-Dichloroethane							
1,2-Dichloroethane							
1,1,2,2,-Tetrachloroethane							
1,1,2-Trichloroethane							
1,3-Butadiene							
1,3-Dichloropropene							
Trimethylbenzenes							
2,2,4-Trimethylpentane							
Acenaphthene	4.68E-06	4.59E-06	4.68E-06	4.59E-06	4.68E-06	4.59E-06	1.38E-05
Acenaphthylene	9.23E-06	9.04E-06	9.23E-06	9.04E-06	9.23E-06	9.04E-06	2.71E-05
Acetaldehyde	2.52E-05	2.47E-05	2.52E-05	2.47E-05	2.52E-05	2.47E-05	7.41E-05
Acrolein	7.88E-06	7.72E-06	7.88E-06	7.72E-06	7.88E-06	7.72E-06	2.32E-05
Anthracene	1.23E-06	1.21E-06	1.23E-06	1.21E-06	1.23E-06	1.21E-06	3.62E-06
Benzo(a)anthracene	6.22E-07	6.09E-07	6.22E-07	6.09E-07	6.22E-07	6.09E-07	1.83E-06
Benzene	7.76E-04	7.60E-04	7.76E-04	7.60E-04	7.76E-04	7.60E-04	2.28E-03
Benzo(a)pyrene	2.57E-07	2.52E-07	2.57E-07	2.52E-07	2.57E-07	2.52E-07	7.55E-07
Benzo(b)fluoranthene	1.11E-06	1.09E-06	1.11E-06	1.09E-06	1.11E-06	1.09E-06	3.26E-06
Benzo(b,k)fluoranthene							
Benzo(e)pyrene							
Benzo(g,h,i)perylene	5.56E-07	5.45E-07	5.56E-07	5.45E-07	5.56E-07	5.45E-07	1.63E-06
Benzo(k)fluoranthene	2.18E-07	2.14E-07	2.18E-07	2.14E-07	2.18E-07	2.14E-07	6.41E-07
Biphenyl							
Carbon Tetrachloride							
Chlorobenzene							
Chloroform							
Chrysene	1.53E-06	1.50E-06	1.53E-06	1.50E-06	1.53E-06	1.50E-06	4.50E-06
Cyclohexane							
Dibenzo(a,h)anthracene	3.46E-07	3.39E-07	3.46E-07	3.39E-07	3.46E-07	3.39E-07	1.02E-06
Ethylbenzene							
Fluoranthene	4.03E-06	3.95E-06	4.03E-06	3.95E-06	4.03E-06	3.95E-06	1.18E-05
Fluorene	1.28E-05	1.25E-05	1.28E-05	1.25E-05	1.28E-05	1.25E-05	3.76E-05
Formaldehyde	7.89E-05	7.73E-05	7.89E-05	7.73E-05	7.89E-05	7.73E-05	2.32E-04
Indeno(1,2,3-cd)pyrene	4.14E-07	4.06E-07	4.14E-07	4.06E-07	4.14E-07	4.06E-07	1.22E-06
Methanol							
Methyl chloride							
Total PAHs	1.30E-04	1.27E-04	1.30E-04	1.27E-04	1.30E-04	1.27E-04	3.82E-04
n-Hexane							

Potential Emissions - Palo Seco Power Plant Black Start Engines

Pollutant	Emissions From BSG-PS-1 609 hp		Emissions From BSG-PS-2 609 hp		Emissions From BSG-PS-3 609 hp		Totals
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.675	1.641	1.675	1.641	1.675	1.641	4.922
CO	0.780	0.764	0.780	0.764	0.780	0.764	2.292
VOC	0.046	0.045	0.046	0.045	0.046	0.045	0.136
PM (filterable only)	0.0370	0.036	0.0370	0.036	0.0370	0.036	0.109
PM10	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
PM2.5	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
SO2	0.0015	0.001	0.0015	0.001	0.0015	0.001	0.004
H2SO4	0.0002	0.000	0.0002	0.000	0.0002	0.000	0.001
CO2e	163.64	160.3	163.64	160.3	163.64	160.3	481.0
OCDD							
Perylene							
Phenanathrene	4.08E-05	4.00E-05	4.08E-05	4.00E-05	4.08E-05	4.00E-05	1.20E-04
Phenol							
Pyrene	3.71E-06	3.64E-06	3.71E-06	3.64E-06	3.71E-06	3.64E-06	1.09E-05
Styrene							
Toluene	2.81E-04	2.75E-04	2.81E-04	2.75E-04	2.81E-04	2.75E-04	8.26E-04
Vinyl Chloride							
Xylene	1.93E-04	1.89E-04	1.93E-04	1.89E-04	1.93E-04	1.89E-04	5.67E-04
Arsenic	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Antimony	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Beryllium	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Cadmium	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Chromium	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Cobalt	4.93E-06	4.84E-06	4.93E-06	4.84E-06	4.93E-06	4.84E-06	1.45E-05
Lead	9.87E-06	9.67E-06	9.87E-06	9.67E-06	9.87E-06	9.67E-06	2.90E-05
Manganese	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Mercury	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Nickel	4.93E-06	4.84E-06	4.93E-06	4.84E-06	4.93E-06	4.84E-06	1.45E-05
Selenium	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Total HAPs	**1.70E-03**	**1.67E-03**	**1.70E-03**	**1.67E-03**	**1.70E-03**	**1.67E-03**	**5.00E-03**

Engine firing rate	**28.4**	**gal/hr**	**28.4**	**gal/hr**	**28.4**	**gal/hr**
Engine firing rate	**3.92**	**MMBtu/hr**	**3.92**	**MMBtu/hr**	**3.92**	**MMBtu/hr**
Engine operating hours	**500**	**hr/yr**	**500**	**hr/yr**	**500**	**hr/yr**
Engine annual heat input	**1,960**	**MMBtu/yr**	**1,960**	**MMBtu/yr**	**1,960**	**MMBtu/yr**
Fuel Sulfur	**0.0015**	**%**	**0.0015**	**%**	**0.0015**	**%**

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Notes:

1) Organic HAP emissions from AP-42 Section 3.4, Tables 3.4-3 and 3.4-4. Metal HAP emissions from fuel samples
2) NOx, CO, PM (filterable), and VOC (as HC) emissions are from Caterpillar performance specifications
3) PM10/PM2.5 condensable from AP-42, Table 3.4-2
4) SO2 emissions from mass balance and fuel sulfur content
5) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
6) CO2e emissions from 40 CFR 98, Subchapter C, Tables 1 and 2 and GWPs in 40 CFR 98, Subchapter A, Table 1

Potential Emissions - Palo Seco Power Plant Emergency Engines

Pollutant	Emissions From GE-GIS-PS-1 385 hp		Emissions From B1-PS-1 208 hp		Emissions From GE-PS-1 765 hp		Emissions From GE-PS-2 765 hp		Totals
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.048	0.64	2.492	0.89	3.2	4.16	3.2	4.16	9.85E+00
CO	0.909	0.55	0.831	0.30	0.85	1.11	0.85	1.11	3.06E+00
VOC	0.35	0.21	0.35	0.13	0.0819	0.11	0.0819	0.11	5.51E-01
PM	0.0524	0.03	0.1278	0.05	0.062	0.08	0.062	0.08	2.39E-01
PM10	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
PM2.5	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
SO2	0.0015	0.00	0.0015	0.00	0.5050	0.66	0.5050	0.66	1.32E+00
H2SO4	2.30E-04	1.39E-04	2.30E-04	8.24E-05	7.73E-02	1.01E-01	7.73E-02	1.01E-01	2.01E-01
CO2e	1.64E+02	9.94E+01	1.64E+02	5.87E+01	1.64E+02	2.13E+02	1.64E+02	2.13E+02	5.84E+02
1,1,1-Trichloroethane									
1,1-Dichloroethane									
1,2-Dichloroethane									
1,1,2,2,-Tetrachloroethane									
1,1,2-Trichloroethane									
1,3-Butadiene	3.90E-05	2.37E-05	3.90E-05	1.40E-05					3.77E-05
1,3-Dichloropropene									
Trimethylbenzenes									
2,2,4-Trimethylpentane									
Acenaphthene	1.40E-06	8.50E-07	1.40E-06	5.02E-07	4.68E-06	6.09E-06	4.68E-06	6.09E-06	1.35E-05
Acenaphthylene	5.10E-06	3.10E-06	5.10E-06	1.83E-06	9.23E-06	1.20E-05	9.23E-06	1.20E-05	2.89E-05
Acetaldehyde	7.74E-04	4.70E-04	7.74E-04	2.78E-04	2.52E-05	3.28E-05	2.52E-05	3.28E-05	8.13E-04
Acrolein	9.30E-05	5.65E-05	9.30E-05	3.34E-05	7.88E-06	1.02E-05	7.88E-06	1.02E-05	1.10E-04
Anthracene	1.90E-06	1.15E-06	1.90E-06	6.82E-07	1.23E-06	1.60E-06	1.23E-06	1.60E-06	5.03E-06
Benzo(a)anthracene	1.70E-06	1.03E-06	1.70E-06	6.10E-07	6.22E-07	8.09E-07	6.22E-07	8.09E-07	3.26E-06
Benzene	9.30E-04	5.65E-04	9.30E-04	3.34E-04	7.76E-04	1.01E-03	7.76E-04	1.01E-03	2.92E-03
Benzo(a)pyrene					2.57E-07	3.34E-07	2.57E-07	3.34E-07	6.69E-07
Benzo(b)fluoranthene					1.11E-06	1.44E-06	1.11E-06	1.44E-06	2.89E-06
Benzo(b,k)fluoranthene	1.70E-07	1.03E-07	1.70E-07	6.10E-08					1.64E-07
Benzo(e)pyrene									
Benzo(g,h,i)perylene	4.90E-07	2.98E-07	4.90E-07	1.76E-07	5.56E-07	7.23E-07	5.56E-07	7.23E-07	1.92E-06
Benzo(k)fluoranthene					2.18E-07	2.84E-07	2.18E-07	2.84E-07	5.67E-07
Biphenyl									
Carbon Tetrachloride									
Chlorobenzene									
Chloroform									
Chrysene	3.50E-07	2.13E-07	3.50E-07	1.26E-07	1.53E-06	1.99E-06	1.53E-06	1.99E-06	4.32E-06
Cyclohexane									
Dibenzo(a,h)anthracene	5.80E-07	3.52E-07	5.80E-07	2.08E-07	3.46E-07	4.50E-07	3.46E-07	4.50E-07	1.46E-06
Ethylbenzene									
Fluoranthene	7.60E-06	4.61E-06	7.60E-06	2.73E-06	4.03E-06	5.24E-06	4.03E-06	5.24E-06	1.78E-05
Fluorene	2.90E-05	1.76E-05	2.90E-05	1.04E-05	1.28E-05	1.66E-05	1.28E-05	1.66E-05	6.13E-05
Formaldehyde	1.20E-03	7.29E-04	1.20E-03	4.31E-04	7.89E-05	1.03E-04	7.89E-05	1.03E-04	1.36E-03
Indeno(1,2,3-cd)pyrene	3.80E-07	2.31E-07	3.80E-07	1.36E-07	4.14E-07	5.38E-07	4.14E-07	5.38E-07	1.44E-06
Methanol									
Methyl chloride									
Total PAHs	1.70E-04	1.03E-04	1.70E-04	6.10E-05	1.30E-04	1.69E-04	1.30E-04	1.69E-04	5.02E-04
n-Hexane									
OCDD									
Perylene									
Phenanathrene	2.90E-05	1.76E-05	2.90E-05	1.04E-05	4.08E-05	5.31E-05	4.08E-05	5.31E-05	1.34E-04
Phenol									
Pyrene	4.80E-06	2.91E-06	4.80E-06	1.72E-06	3.71E-06	4.83E-06	3.71E-06	4.83E-06	1.43E-05
Styrene									
Toluene	4.10E-04	2.49E-04	4.10E-04	1.47E-04	2.81E-04	3.65E-04	2.81E-04	3.65E-04	1.13E-03
Vinyl Chloride									
Xylene	2.90E-04	1.76E-04	2.90E-04	1.04E-04	1.93E-04	2.51E-04	1.93E-04	2.51E-04	7.82E-04
Arsenic	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05
Antimony	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05

Potential Emissions - Palo Seco Power Plant Emergency Engines

Pollutant	Emissions From GE-GIS-PS-1 385 hp		Emissions From B1-PS-1 208 hp		Emissions From GE-PS-1 765 hp		Emissions From GE-PS-2 765 hp		Totals
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.048	0.64	2.492	0.89	3.2	4.16	3.2	4.16	9.85E+00
CO	0.909	0.55	0.831	0.30	0.85	1.11	0.85	1.11	3.06E+00
VOC	0.35	0.21	0.35	0.13	0.0819	0.11	0.0819	0.11	5.51E-01
PM	0.0524	0.03	0.1278	0.05	0.062	0.08	0.062	0.08	2.39E-01
PM10	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
PM2.5	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
SO2	0.0015	0.00	0.0015	0.00	0.5050	0.66	0.5050	0.66	1.32E+00
H2SO4	2.30E-04	1.39E-04	2.30E-04	8.24E-05	7.73E-02	1.01E-01	7.73E-02	1.01E-01	2.01E-01
CO2e	1.64E+02	9.94E+01	1.64E+02	5.87E+01	1.64E+02	2.13E+02	1.64E+02	2.13E+02	5.84E+02
Beryllium	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06
Cadmium	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06
Chromium	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06
Cobalt	4.93E-06	3.00E-06	4.93E-06	1.77E-06	4.93E-06	6.42E-06	4.93E-06	6.42E-06	1.76E-05
Lead	9.87E-06	5.99E-06	9.87E-06	3.54E-06	9.87E-06	1.28E-05	9.87E-06	1.28E-05	3.52E-05
Manganese	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06
Mercury	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05
Nickel	4.93E-06	3.00E-06	4.93E-06	1.77E-06	4.93E-06	6.42E-06	4.93E-06	6.42E-06	1.76E-05
Selenium	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05
Total HAPs	**4.12E-03**	**2.50E-03**	**4.12E-03**	**1.48E-03**	**1.70E-03**	**2.21E-03**	**1.70E-03**	**2.21E-03**	**8.40E-03**

Engine firing rate	**17.6**	**gal/hr**	**10.4**	**gal/hr**	**37.7**	**gal/hr**	**37.7**	**gal/hr**
Engine operating hours	**500**	**hr/yr**	**500**	**hr/yr**	**500**	**hr/yr**	**500**	**hr/yr**
Engine annual heat input	**1,214**	**MMBtu/yr**	**718**	**MMBtu/yr**	**2,601**	**MMBtu/yr**	**2,601**	**MMBtu/yr**
Fuel Sulfur	**0.0015**	**%**	**0.0015**	**%**	**0.50**	**%**	**0.50**	**%**

Notes:

1) Organic HAP emissions from diesel engines rated <600 hp from AP-42 Section 3.3, Table 3.3-2. Metal HAP emissions from fuel samples
2) Organic HAP emissions from diesel engines rated >600 hp from AP-42 Section 3.4, Tables 3.4-3 and 3.4-4. Metal HAP emissions from fuel samples
3) HAP emisisons from propane engine from AP-42 Section 3.2, Table 3.2-2.
4) NOx, CO, and PM (filterable) emissions are from 40 CFR 60 NSPS Subpart IIII for GE-GIS-PS-1 and B1-PS-1
5) VOC from AP-42 Tables 3.3-1 and 3.4-1
6) SO2 emissions from mass balance and fuel sulfur content
7) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
8) CO2e emissions from 40 CFR 98, Subchapter C, Tables 1 and 2

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Potential Emissions - Palo Seco Natural Gas Handling System Fugitive Emissions

Emission Factors	
Source Type	**Gas (kg/hr/source)**
Flanges (Vapor)	0.00039
Flanges (Liquid)	0.00011
Valves (Vapor)	0.0045
Others (compressors, drains, instruments, meters, PSVs, vents) (Vapor)	0.0088

Emission factors are from EPA's "Protocol for Equipment Leak Emissions Estimates" Table 2-4 (November 1995)

Potential Emissions					
Source Type	**Source Type Used**	**Count**	**All Gas (tpy)**	**VOC (tpy)**	**GHG (tpy)**
Flange (Vapor)	Flanges	38	0.143	0.014	3.2
Flange (Liquid)	Flanges	20	0.021	0.002	0.5
Valves (Vapor)	Valves	53	2.303	0.230	51.8
Vents, Drains, PIs, LIs, PSVs (Vapor)	Others	36	3.060	0.306	68.8
TOTALS			**5.53**	**0.55**	**124.4**
LNG estimated to have combined methane and ethane content >95% but emissions conservatively assume a VOC content of 10 percent.					
GHG emissions based upon all non-VOC emissions being methane with a global warmng potential of 25 (see 40 CFR 98, Subpart A, Table A-1)					

$$GHG\left(\frac{ton}{year}\right) = \left[All\ gas\left(\frac{ton}{year}\right) - VOC\left(\frac{ton}{year}\right)\right] X\ 25$$

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PREPA Palo Seco

Proposed Compliance Emissions Tracking - Pratt & Whitney FT8 Combustion Turbine Project

The two limiting pollutants to net out of PSD are CO for gas firing and PM2.5 for oil firing to avoid PSD. A simple fuel cap can be assumed if only one fuel is fired in any year, however in a typical year will likely include firing of both fuels. To account for this, the following compliance mechanism will be implemented to ensure that the emissions of all pollutants remain below the proposed emission caps to ensure that the Project nets out of PSD.

PREPA shall track daily fuel usage and emissions.
The daily emissions shall be used to calculate rolling 365-day emissins

NOx:

$$NOx\left(\frac{ton}{day}\right) + NOx\ Total\ tons\ (364\ previous\ days) < 753.4\ tons\ 365\ days\ rolling$$

$$NOx\left(\frac{ton}{day}\right) = [NSPS\ Subpart\ KKKK\ Limit\left(\frac{1.2\ lb}{MW-hr}\right) X\ USNG\left(\frac{MW-hr}{day}\right) + NSPS\ Subpart\ KKKK\ Limit\left(\frac{3.6\ lb}{MW-hr}\right) X\ USdiesel\ \left(\frac{MW-hr}{day}\right)] \div 2.000\ lb/ton$$

CO:

$$CO\left(\frac{ton}{day}\right) + CO\ Total\ tons\ (364\ previous\ days) < 99.4\ tons\ 365\ days\ rolling$$

$$CO\left(\frac{ton}{day}\right) = [0.0767\left(\frac{lb}{MMBtu}\right) X\ USNG\left(\frac{MMBtu}{day}\right) + 0.0343\left(\frac{lb}{MMBtu}\right) X\ USdiesel\ \left(\frac{MMBtu}{day}\right)] \div 2.000\ lb/ton$$

PM:

$$PM\left(\frac{ton}{day}\right) + PM\ Total\ tons\ (364\ previous\ days) < 34.6\ tons\ 365\ days\ rolling$$

$$PM\left(\frac{ton}{day}\right) = [0.010\left(\frac{lb}{MMBtu}\right) X\ USNG\left(\frac{MMBtu}{day}\right) + 0.0177\left(\frac{lb}{MMBtu}\right) X\ USdiesel\ \left(\frac{MMBtu}{day}\right)] \div 2.000\ lb/ton$$

PM10:

$$PM10\left(\frac{ton}{day}\right) + PM10\ Total\ tons\ (364\ previous\ days) < 24.6\ tons\ 365\ days\ rolling$$

$$PM10\left(\frac{ton}{day}\right) = [0.010\left(\frac{lb}{MMBtu}\right) X\ USNG\left(\frac{MMBtu}{day}\right) + 0.0177\left(\frac{lb}{MMBtu}\right) X\ USdiesel\ \left(\frac{MMBtu}{day}\right)] \div 2.000\ lb/ton$$

PM2.5:

$$PM2.5\left(\frac{ton}{day}\right) + PM2.5\ Total\ tons\ (364\ previous\ days) < 19.6\ tons\ 365\ days\ rolling$$

$$PM2.5\left(\frac{ton}{day}\right) = [0.010\left(\frac{lb}{MMBtu}\right) X\ USNG\left(\frac{MMBtu}{day}\right) + 0.0177\left(\frac{lb}{MMBtu}\right) X\ USdiesel\ \left(\frac{MMBtu}{day}\right)] \div 2.000\ lb/ton$$

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VOC:

$$VOC\left(\frac{ton}{day}\right) + VOC\ Total\ tons\ (364\ previous\ days) < 40.1\ tons\ 365\ days\ rolling$$

$$VOC\left(\frac{ton}{day}\right) = [0.0051\left(\frac{lb}{MMBtu}\right) X\ USNG\left(\frac{MMBtu}{day}\right) + 0.0071\left(\frac{lb}{MMBtu}\right) X\ USdiesel\left(\frac{MMBtu}{day}\right)] \div 2{,}000\ lb/ton$$

SO2:

$$SO2\left(\frac{ton}{day}\right) + SO2\ Total\ tons\ (364\ previous\ days) < 59.7\ tons\ 365\ days\ rolling$$

$$SO2\left(\frac{ton}{day}\right) = [NG\left(\frac{gr\ S}{100\ dscf}\right) X\left(\frac{1\ lb}{7{,}000\ gr}\right) X\left(\frac{1\ dscf}{1{,}020\ Btu}\right) X\left(\frac{1x10^6\ Btu}{MMBtu}\right) X\ USNG\left(\frac{MMBtu}{day}\right) +$$

$$Diesel\ wt\%\ S\ X\ Diesel\ gals\ X\left(\frac{7.05\ lb}{gal}\right) X\ USDiesel\left(\frac{MMBtu}{day}\right)] X\left(\frac{2\ lb\ SO2}{lb\ S}\right) \div 2{,}000\ lb/ton$$

H2SO4:

$$H2SO4\left(\frac{ton}{day}\right) + H2SO4\ Total\ tons\ (364\ previous\ days) < 9.9\ tons\ 365\ days\ rolling$$

$$H2SO4\left(\frac{ton}{day}\right) = SO2\left(\frac{ton}{day}\right) x\ \frac{98\ lb\ H2SO4}{64\ lb\ SO2}\ x\ 10\%$$

GHGs:

$$GHG\left(\frac{ton}{day}\right) + GHG\ Total\ tons\ (364\ previous\ days) < 208{,}115\ tons\ 365\ days\ rolling$$

$$GHG\left(\frac{ton}{day}\right) = [117.12\left(\frac{lb}{MMBtu}\right) X\ USNG\left(\frac{MMBtu}{day}\right) + 163.64\left(\frac{lb}{MMBtu}\right) X\ USdiesel\left(\frac{MMBtu}{day}\right)] \div 2{,}000\ lb/ton$$

EFRAN PAREDES MAISONET
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LIC #17776
PUERTO RICO

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Baseline Emissions

			NOx		PM/PM10/PM2.5		SO2		H2SO4		CO		VOC		GHGs	
Month	PSGT 2-2, 3-1, and 3-2 Oil Consumption (bbls)	% Sulfur	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)
2009	**13,212.0**	**0.040**														
Jan	215.7	0.040	0.55		0.01		0.03		0.00		0.00		0.00		102.27	
Feb	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Mar	56.7	0.040	0.14		0.00		0.01		0.00		0.00		0.00		26.87	
Apr	113.8	0.040	0.29		0.00		0.01		0.00		0.00		0.00		53.98	
May	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Jun	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Jul	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Aug	2,813.5	0.025	7.17		0.10		0.21		0.03		0.03		0.00		1,334.23	
Sep	2,655.0	0.020	6.77		0.09		0.16		0.02		0.03		0.00		1,259.09	
Oct	7,357.4	0.018	18.76		0.26		0.39		0.06		0.07		0.01		3,489.12	
Nov	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Dec	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
2010	**12,979.4**	**0.024**														
Jan	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Feb	3,040.1	0.020	7.75		0.11		0.17		0.03		0.03		0.00		1,441.73	
Mar	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Apr	100.0	0.020	0.25		0.00		0.01		0.00		0.00		0.00		47.41	
May	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Jun	2,580.2	0.024	6.58		0.09		0.18		0.03		0.02		0.00		1,223.63	
Jul	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Aug	4,069.6	0.024	10.38		0.14		0.28		0.04		0.04		0.00		1,929.93	
Sep	3,189.4	0.020	8.13		0.11		0.19		0.03		0.03		0.00		1,512.53	
Oct	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Nov	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Dec	0.0	0.000	0.00	33.40	0.00	0.46	0.00	0.81	0.00	0.12	0.00	0.13	0.00	0.02	0.00	6,210.40
2011	**7,956.4**	**0.020**														
Jan	0.0	0.000	0.00	33.12	0.00	0.45	0.00	0.80	0.00	0.12	0.00	0.12	0.00	0.02	0.00	6,159.27
Feb	0.0	0.000	0.00	33.12	0.00	0.45	0.00	0.80	0.00	0.12	0.00	0.12	0.00	0.02	0.00	6,159.27
Mar	476.9	0.020	1.22	33.66	0.02	0.46	0.03	0.81	0.00	0.12	0.00	0.13	0.00	0.02	226.18	6,258.92
Apr	0.0	0.000	0.00	33.51	0.00	0.46	0.00	0.81	0.00	0.12	0.00	0.13	0.00	0.02	0.00	6,231.93
May	0.0	0.000	0.00	33.51	0.00	0.46	0.00	0.81	0.00	0.12	0.00	0.13	0.00	0.02	0.00	6,231.93
Jun	0.0	0.000	0.00	33.51	0.00	0.46	0.00	0.81	0.00	0.12	0.00	0.13	0.00	0.02	0.00	6,231.93
Jul	0.0	0.000	0.00	33.51	0.00	0.46	0.00	0.81	0.00	0.12	0.00	0.13	0.00	0.02	0.00	6,231.93
Aug	2,799.2	0.020	7.14	33.49	0.10	0.46	0.16	0.78	0.03	0.12	0.03	0.13	0.00	0.02	1,327.48	6,228.55
Sep	1,148.2	0.020	2.93	31.57	0.04	0.43	0.07	0.74	0.01	0.11	0.01	0.12	0.00	0.01	544.52	5,871.27
Oct	3,532.0	0.020	9.01	26.70	0.12	0.36	0.21	0.65	0.03	0.10	0.03	0.10	0.00	0.01	1,675.01	4,964.22
Nov	0.0	0.000	0.00	26.70	0.00	0.36	0.00	0.65	0.00	0.10	0.00	0.10	0.00	0.01	0.00	4,964.22
Dec	0.0	0.000	0.00	26.70	0.00	0.36	0.00	0.65	0.00	0.10	0.00	0.10	0.00	0.01	0.00	4,964.22
2012	**11,064.7**	**0.020**														
Jan	0.0	0.000	0.00	26.70	0.00	0.36	0.00	0.65	0.00	0.10	0.00	0.10	0.00	0.01	0.00	4,964.22
Feb	9,971.2	0.010	25.43	35.53	0.35	0.48	0.29	0.71	0.04	0.11	0.10	0.13	0.01	0.02	4,728.65	6,607.67
Mar	0.0	0.000	0.00	35.53	0.00	0.48	0.00	0.71	0.00	0.11	0.00	0.13	0.00	0.02	0.00	6,607.67
Apr	0.0	0.000	0.00	35.41	0.00	0.48	0.00	0.71	0.00	0.11	0.00	0.13	0.00	0.02	0.00	6,583.97
May	0.0	0.000	0.00	35.41	0.00	0.48	0.00	0.71	0.00	0.11	0.00	0.13	0.00	0.02	0.00	6,583.97
Jun	920.7	0.020	2.35	33.29	0.03	0.45	0.05	0.64	0.01	0.10	0.01	0.12	0.00	0.02	436.61	6,190.46
Jul	0.0	0.000	0.00	33.29	0.00	0.45	0.00	0.64	0.00	0.10	0.00	0.12	0.00	0.02	0.00	6,190.46
Aug	0.0	0.000	0.00	28.10	0.00	0.38	0.00	0.50	0.00	0.08	0.00	0.11	0.00	0.01	0.00	5,225.49
Sep	172.9	0.010	0.44	24.25	0.01	0.33	0.01	0.41	0.00	0.06	0.00	0.09	0.00	0.01	81.98	4,510.21
Oct	0.0	0.000	0.00	24.25	0.00	0.33	0.00	0.41	0.00	0.06	0.00	0.09	0.00	0.01	0.00	4,510.21
Nov	0.0	0.000	0.00	24.25	0.00	0.33	0.00	0.41	0.00	0.06	0.00	0.09	0.00	0.01	0.00	4,510.21

AP-42 Section 3.1 Emission Factors (lb/MMBtu): NOx = 0.88; PM = 0.012; SO2 = 1.01 x %S; CO = 0.0033; VOC = 0.00041

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Baseline Emissions

Month	PSGT 2-2, 3-1, and 3-2 Oil Consumption (bbls)	% Sulfur	NOx (tons)	NOx 24-month (tpy)	PM/PM10/PM2.5 (tons)	PM/PM10/PM2.5 24-month (tpy)	SO2 (tons)	SO2 24-month (tpy)	H2SO4 (tons)	H2SO4 24-month (tpy)	CO (tons)	CO 24-month (tpy)	VOC (tons)	VOC 24-month (tpy)	GHGs (tons)	GHGs 24-month (tpy)
Dec	0.0	0.000	0.00	24.25	0.00	0.33	0.00	0.41	0.00	0.06	0.00	0.09	0.00	0.01	0.00	4,510.21
2013	**8,759.6**	**0.020**														
Jan	0.0	0.000	0.00	24.25	0.00	0.33	0.00	0.41	0.00	0.06	0.00	0.09	0.00	0.01	0.00	4,510.21
Feb	7,162.7	0.020	18.27	33.39	0.25	0.46	0.41	0.61	0.06	0.09	0.07	0.13	0.01	0.02	3,396.78	6,208.60
Mar	0.0	0.000	0.00	32.78	0.00	0.45	0.00	0.60	0.00	0.09	0.00	0.12	0.00	0.02	0.00	6,095.51
Apr	0.0	0.000	0.00	32.78	0.00	0.45	0.00	0.60	0.00	0.09	0.00	0.12	0.00	0.02	0.00	6,095.51
May	0.0	0.000	0.00	32.78	0.00	0.45	0.00	0.60	0.00	0.09	0.00	0.12	0.00	0.02	0.00	6,095.51
Jun	0.0	0.000	0.00	32.78	0.00	0.45	0.00	0.60	0.00	0.09	0.00	0.12	0.00	0.02	0.00	6,095.51
Jul	139.2	0.020	0.36	32.96	0.00	0.45	0.01	0.60	0.00	0.09	0.00	0.12	0.00	0.02	66.02	6,128.52
Aug	0.0	0.000	0.00	29.39	0.00	0.40	0.00	0.52	0.00	0.08	0.00	0.11	0.00	0.01	0.00	5,464.78
Sep	1,457.7	0.020	3.72	29.78	0.05	0.41	0.09	0.53	0.01	0.08	0.01	0.11	0.00	0.01	691.30	5,538.17
Oct	0.0	0.000	0.00	25.28	0.00	0.34	0.00	0.43	0.00	0.07	0.00	0.09	0.00	0.01	0.00	4,700.66
Nov	0.0	0.000	0.00	25.28	0.00	0.34	0.00	0.43	0.00	0.07	0.00	0.09	0.00	0.01	0.00	4,700.66
Dec	0.0	0.000	0.00	25.28	0.00	0.34	0.00	0.43	0.00	0.07	0.00	0.09	0.00	0.01	0.00	4,700.66
2014	**119,480.3**	**0.020**														
Jan	0.0	0.000	0.00	25.28	0.00	0.34	0.00	0.43	0.00	0.07	0.00	0.09	0.00	0.01	0.00	4,700.66
Feb	0.0	0.000	0.00	12.56	0.00	0.17	0.00	0.28	0.00	0.04	0.00	0.05	0.00	0.01	0.00	2,336.34
Mar	545.1	0.020	1.39	13.26	0.02	0.18	0.03	0.30	0.00	0.05	0.01	0.05	0.00	0.01	258.50	2,465.59
Apr	1,662.5	0.020	4.24	15.38	0.06	0.21	0.10	0.35	0.01	0.05	0.02	0.06	0.00	0.01	788.43	2,859.81
May	10,213.0	0.018	26.05	28.40	0.36	0.39	0.53	0.61	0.08	0.09	0.10	0.11	0.01	0.01	4,843.33	5,281.47
Jun	7,112.5	0.020	18.14	36.30	0.25	0.49	0.42	0.79	0.06	0.12	0.07	0.14	0.01	0.02	3,372.99	6,749.66
Jul	16,711.2	0.019	42.62	57.61	0.58	0.79	0.91	1.25	0.14	0.19	0.16	0.22	0.02	0.03	7,925.00	10,712.16
Aug	52,615.4	0.017	134.18	124.70	1.83	1.70	2.68	2.59	0.41	0.40	0.50	0.47	0.06	0.06	24,951.94	23,188.14
Sep	16,883.6	0.010	43.06	146.00	0.59	1.99	0.47	2.83	0.07	0.43	0.16	0.55	0.02	0.07	8,006.75	27,150.52
Oct	9,729.2	0.010	24.81	158.41	0.34	2.16	0.27	2.96	0.04	0.45	0.09	0.59	0.01	0.07	4,613.90	29,457.47
Nov	3,212.0	0.011	8.19	162.51	0.11	2.22	0.10	3.01	0.02	0.46	0.03	0.61	0.00	0.08	1,523.23	30,219.09
Dec	795.9	0.010	2.03	163.52	0.03	2.23	0.02	3.02	0.00	0.46	0.01	0.61	0.00	0.08	377.42	30,407.80
2015	**186,089.6**	**0.022**														
Jan	464.9	0.010	1.19	164.11	0.02	2.24	0.01	3.03	0.00	0.46	0.00	0.62	0.00	0.08	220.48	30,518.04
Feb	691.1	0.010	1.76	155.86	0.02	2.13	0.02	2.83	0.00	0.43	0.01	0.58	0.00	0.07	327.75	28,983.52
Mar	1,434.7	0.010	3.66	157.69	0.05	2.15	0.04	2.86	0.01	0.44	0.01	0.59	0.00	0.07	680.39	29,323.72
Apr	5,283.3	0.010	13.47	164.43	0.18	2.24	0.16	2.93	0.02	0.45	0.05	0.62	0.01	0.08	2,505.52	30,576.48
May	1,276.5	0.010	3.26	166.06	0.04	2.26	0.04	2.95	0.01	0.45	0.01	0.62	0.00	0.08	605.37	30,879.16
Jun	9,074.1	0.011	23.14	177.63	0.32	2.42	0.29	3.10	0.04	0.47	0.09	0.67	0.01	0.08	4,303.25	33,030.79
Jul	10,688.6	0.010	27.26	191.08	0.37	2.61	0.31	3.25	0.05	0.50	0.10	0.72	0.01	0.09	5,068.88	35,532.22
Aug	5,933.8	0.010	15.13	198.64	0.21	2.71	0.17	3.33	0.03	0.51	0.06	0.74	0.01	0.09	2,814.00	36,939.22
Sep	52,771.5	0.015	134.58	264.08	1.84	3.60	2.32	4.45	0.36	0.68	0.50	0.99	0.06	0.12	25,025.98	49,106.55
Oct	31,689.0	0.022	80.81	304.48	1.10	4.15	2.05	5.47	0.31	0.84	0.30	1.14	0.04	0.14	15,027.97	56,620.54
Nov	22,427.0	0.020	57.19	333.08	0.78	4.54	1.34	6.14	0.21	0.94	0.21	1.25	0.03	0.16	10,635.62	61,938.35
Dec	44,355.0	0.022	113.12	389.64	1.54	5.31	2.91	7.60	0.45	1.16	0.42	1.46	0.05	0.18	21,034.60	72,455.65
2016	**181,283.1**	**0.030**														
Jan	14,543.0	0.021	37.09	408.18	0.51	5.57	0.89	8.04	0.14	1.23	0.14	1.53	0.02	0.19	6,896.77	75,904.03
Feb	6,276.0	0.021	16.01	416.19	0.22	5.68	0.38	8.23	0.06	1.26	0.06	1.56	0.01	0.19	2,976.29	77,392.17
Mar	18,228.0	0.020	46.49	438.73	0.63	5.98	1.07	8.76	0.16	1.34	0.17	1.65	0.02	0.20	8,644.32	81,585.08
Apr	10,584.0	0.020	26.99	450.11	0.37	6.14	0.61	9.01	0.09	1.38	0.10	1.69	0.01	0.21	5,019.28	83,700.51
May	17,539.0	0.019	44.73	459.45	0.61	6.27	1.00	9.24	0.15	1.42	0.17	1.72	0.02	0.21	8,317.57	85,437.63
Jun	5,438.0	0.020	13.87	457.32	0.19	6.24	0.32	9.20	0.05	1.41	0.05	1.71	0.01	0.21	2,578.88	85,040.57
Jul	46,750.0	0.030	119.22	495.62	1.63	6.76	4.13	10.81	0.63	1.65	0.45	1.86	0.06	0.23	22,170.39	92,163.26
Aug	39,045.0	0.022	99.57	478.31	1.36	6.52	2.56	10.74	0.39	1.64	0.37	1.79	0.05	0.22	18,516.42	88,945.50
Sep	17,341.0	0.021	44.22	478.90	0.60	6.53	1.09	11.05	0.17	1.69	0.17	1.80	0.02	0.22	8,223.67	89,053.96
Oct	5,136.3	0.016	13.10	473.04	0.18	6.45	0.24	11.03	0.04	1.69	0.05	1.77	0.01	0.22	2,435.78	87,964.90

AP-42 Section 3.1 Emission Factors (lb/MMBtu): NOx = 0.88; PM = 0.012; SO2 = 1.01 x %S; CO = 0.0033; VOC = 0.00041

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Baseline Emissions

			NOx		PM/PM10/PM2.5		SO2		H2SO4		CO		VOC		GHGs	
Month	PSGT 2-2, 3-1, and 3-2 Oil Consumption (bbls)	% Sulfur	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)
Nov	159.6	0.016	0.41	469.15	0.01	6.40	0.01	10.99	0.00	1.68	0.00	1.76	0.00	0.22	75.70	87,241.14
Dec	243.2	0.016	0.62	468.44	0.01	6.39	0.01	10.98	0.00	1.68	0.00	1.76	0.00	0.22	115.35	87,110.10
2017	**300,672.4**	**0.045**														
Jan	3,072.0	0.016	7.83	471.77	0.11	6.43	0.14	11.05	0.02	1.69	0.03	1.77	0.00	0.22	1,456.86	87,728.29
Feb	4,567.4	0.016	11.65	476.71	0.16	6.50	0.21	11.14	0.03	1.71	0.04	1.79	0.01	0.22	2,166.01	88,647.43
Mar	1,700.4	0.013	4.34	477.05	0.06	6.51	0.07	11.15	0.01	1.71	0.02	1.79	0.00	0.22	806.40	88,710.43
Apr	6,686.6	0.013	17.05	478.84	0.23	6.53	0.26	11.21	0.04	1.72	0.06	1.80	0.01	0.22	3,171.02	89,043.18
May	12,826.8	0.010	32.71	493.57	0.45	6.73	0.38	11.38	0.06	1.74	0.12	1.85	0.02	0.23	6,082.90	91,781.95
Jun	20,716.7	0.006	52.83	508.41	0.72	6.93	0.37	11.42	0.06	1.75	0.20	1.91	0.02	0.24	9,824.55	94,542.60
Jul	27,821.3	0.004	70.95	530.26	0.97	7.23	0.34	11.43	0.05	1.75	0.27	1.99	0.03	0.25	13,193.78	98,605.05
Aug	54,325.2	0.007	138.54	591.96	1.89	8.07	1.10	11.90	0.17	1.82	0.52	2.22	0.06	0.28	25,762.78	110,079.44
Sep	30,986.9	0.027	79.02	564.19	1.08	7.69	2.43	11.95	0.37	1.83	0.30	2.12	0.04	0.26	14,694.99	104,913.95
Oct	44,144.4	0.034	112.58	580.07	1.54	7.91	4.39	13.13	0.67	2.01	0.42	2.18	0.05	0.27	20,934.73	107,867.33
Nov	48,381.8	0.045	123.39	613.16	1.68	8.36	6.38	15.64	0.98	2.40	0.46	2.30	0.06	0.29	22,944.22	114,021.63
Dec	45,442.8	0.036	115.89	614.55	1.58	8.38	4.84	16.61	0.74	2.54	0.43	2.30	0.05	0.29	21,550.47	114,279.57
2018	**163,433.8**	**0.032**														
Jan	46,933.0	0.032	119.69	655.85	1.63	8.94	4.39	18.36	0.67	2.81	0.45	2.46	0.06	0.31	22,257.15	121,959.76
Feb	41,449.7	0.019	105.71	700.70	1.44	9.56	2.31	19.33	0.35	2.96	0.40	2.63	0.05	0.33	19,656.80	130,300.01
Mar	24,675.0	0.024	62.93	708.92	0.86	9.67	1.76	19.67	0.27	3.01	0.24	2.66	0.03	0.33	11,701.68	131,828.69
Apr	18,039.1	0.018	46.00	718.43	0.63	9.80	0.93	19.83	0.14	3.04	0.17	2.69	0.02	0.33	8,554.75	133,596.43
May	6,210.3	0.014	15.84	703.98	0.22	9.60	0.25	19.46	0.04	2.98	0.06	2.64	0.01	0.33	2,945.12	130,910.21
Jun	2,091.9	0.022	5.33	699.72	0.07	9.54	0.14	19.37	0.02	2.97	0.02	2.62	0.00	0.33	992.06	130,116.80
Jul	4,691.7	0.027	11.96	646.09	0.16	8.81	0.38	17.49	0.06	2.68	0.04	2.42	0.01	0.30	2,224.95	120,144.08
Aug	8,599.4	0.029	21.93	607.27	0.30	8.28	0.73	16.58	0.11	2.54	0.08	2.28	0.01	0.28	4,078.11	112,924.93
Sep	290.6	0.028	0.74	585.53	0.01	7.98	0.02	16.05	0.00	2.46	0.00	2.20	0.00	0.27	137.82	108,882.00
Oct	1,224.1	0.028	3.12	580.54	0.04	7.92	0.10	15.98	0.02	2.45	0.01	2.18	0.00	0.27	580.53	107,954.38
Nov	5,820.9	0.024	14.84	587.76	0.20	8.01	0.41	16.18	0.06	2.48	0.06	2.20	0.01	0.27	2,760.46	109,296.76
Dec	3,408.1	0.018	8.69	591.79	0.12	8.07	0.18	16.26	0.03	2.49	0.03	2.22	0.00	0.28	1,616.21	110,047.19
2019	**2,606.1**	**0.018**														
Jan	0.0	0.000	0.00	587.87	0.00	8.02	0.00	16.19	0.00	2.48	0.00	2.20	0.00	0.27	0.00	109,318.76
Feb	78.2	0.018	0.20	582.15	0.00	7.94	0.00	16.09	0.00	2.46	0.00	2.18	0.00	0.27	37.09	108,254.30
Mar	767.4	0.018	1.96	580.96	0.03	7.92	0.04	16.07	0.01	2.46	0.01	2.18	0.00	0.27	363.94	108,033.07
Apr	1,760.5	0.017	4.49	574.68	0.06	7.84	0.09	15.99	0.01	2.45	0.02	2.16	0.00	0.27	834.89	106,865.00

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PREPA Palo Seco - Pratt & Whitney FT-8 Allowable Operation To Net Out of PSD

Pollutant	PSGT 2-2, 3-1, and 3-2 Baseline Emissions (tpy)	BSG Potential Emissions (tpy)	PSD Significance (tpy)	PW FT8 Allowable Emissions (tpy)	PW FT8 Emissions Gas (lb/MMBtu)	PW FT8 Allowable Gas (MMBtu/yr)	PW FT8 Emissions Oil (lb/MMBtu)	PW FT8 Allowable Oil (MMBtu/yr)
NOx	718.4	4.92	40	753.4	0.1100	13,698,316	0.1731	8,704,880
PM	9.8	0.131	25	34.6	0.010	6,793,487	0.0177	3,905,707
PM10	9.8	0.131	15	24.6	0.010	4,828,092	0.0177	2,775,763
PM2.5	9.8	0.131	10	19.6	0.010	3,845,394	0.0177	2,210,791
SO2	19.8	0.004	40	59.7	0.0140	8,532,314	0.0505	2,365,394
VOC	0.33	0.14	40	40.1	0.0051	15,620,658	0.0071	11,263,804
CO	2.69	2.29	100	99.4	0.0767	2,593,341	0.0343	5,796,061
H2SO4	3.04	0.001	7	9.99	0.0021	9,316,279	0.0077	2,582,731
GHGs	133,596	481	75,000	208,115	117.12	3,553,938	163.64	2,543,553

NOTES:

PW FT8 Allowable Emissions (tpy) are equal to baseline emissions for PSGT 2-2, 3-1, and 3-2 plus PSD Significance Threshold

PW FT8 Emissions (lb/MMBtu) are based upon PW FT8 performance data at 85°F

PW FT8 Allowable (MMBtu/yr) based upon allowable emissions (tpy) and emission rates (lb/MMBtu) for each pollutant

PW FT8 Allowable (hr/yr) are total hours for all three proposed PW FT8 Turbines based on allowable MMBtu/yr and 294.8 MMBtu/hr gas firing and 283.3 MM Btu/hr oil firing

Natural gas sulfur content limited to 5 grains per 100 standard cubic feet of gas

Distillate oil sulfur content limited to 0.05 percent by weight

GHGs are based upon the global warming potentials and emission factors in 40 CFR §98, Subpart A, Table A-1 and 40 CFR §98, Subpart C, Tables C-1 and C-2.

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Palo Seco Combustion Turbine Project Potential Emissions Versus PSD Significance Thresholds

Pollutant	Combustion Turbine Potential (tpy)	BSGs Potential (tpy)	Natural Gas Handling Potential (tpy)	Project Total Potential (tpy)	PSD Significance Threshold (tpy)
NO_x	191.34	4.922	0	196.3	40
PM	19.57	0.109	0	19.7	25
PM_{10}	19.57	0.131	0	19.7	15
$PM_{2.5}$	19.57	0.131	0	19.7	10
CO	99.45	2.292	0	101.7	100
VOC	7.85	0.136	0.55	8.54	40
SO_2	55.82	0.004	0	55.8	40
H_2SO_4	8.55	0.001	0	8.55	7
GHGs (as CO2e)	180,889	481	124	181,494	75,000

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Future Potential Emissions - Palo Seco Power Plant														
Pollutant	Emissions From PSGT 1-1, 1-2, and 2-1			Emissions From New FT8 Combustion Turbines				Emissions From New FT8 Combustion Turbines	Emissions From New BSGs	Emissions From Units 1-4			Emergency Engines	Total Power Plant Emissions
	AP-42 04/00 - GT Fuel Oil Table 3.1-4 for Organics Fuel Sample Metals			Vendor Specs Criteria Pollutants. AP-42 04/00 - Oil Table 3.1-4 for Organic HAPs. Fuel Sample Metal HAPs		Vendor Specs Criteria Pollutants. AP-42 04/00 - Gas Table 3.1-3 for Organic HAPs.				AP-42 09/98 - No. 6 Oil Combustion Table 1.3-9 and 1.3-11 No. 6 Fuel Oil Sample for Metals				
	ppm	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	ton/yr	ton/yr	ppm	lb/MMBtu	ton/yr	ton/yr	(ton/yr)
NOx		8.8E-01	3,486.3	1.73E-01	191.3	1.10E-01	142.6	191.34	4.92		0.2133	3,811.6	9.85	7,499.1
CO		3.3E-03	13.1	3.43E-02	37.9	7.67E-02	99.5	99.45	2.29		0.0333	595.6	3.06	711.2
VOC		4.1E-04	1.6	7.10E-03	7.85	5.13E-03	6.7	7.85	0.14		0.0051	90.5	0.55	100.6
PM		0.012	47.5	0.0177	19.6	0.010	13.2	19.57	0.13		0.0521	930.9	0.24	998.2
PM10		0.012	47.5	0.0177	19.6	0.010	13.2	19.57	0.13		0.0470	839.6	0.23	907.0
PM2.5		0.012	47.5	0.0177	19.6	0.010	13.2	19.57	0.13		0.0470	839.6	0.23	907.0
SO2		5.05E-01	2,000.7	5.05E-02	55.82	1.40E-03	1.8	55.82	0.004		0.5423	9,689.9	1.32	11,747.7
H2SO4		7.73E-02	306.4	7.73E-03	8.55	2.14E-04	0.3	8.55	0.001		8.30E-02	1,483.8	0.20	1,798.9
GHGs as CO2e		163.64	648,300	163.64	180,889	117.12	151,864	180,889	481.0		1.66E+02	2,968,700	584	3,798,472
1,1,1-Trichloroethane											1.57E-06	2.81E-02		2.81E-02
1,3-Butadiene		1.60E-05	6.34E-02	1.60E-05	1.77E-02	4.30E-07	5.58E-04	1.77E-02					3.77E-05	8.11E-02
Acenaphthene									1.38E-05		1.41E-07	2.51E-03	1.35E-05	2.53E-03
Acenaphthylene									2.71E-05		1.69E-09	3.01E-05	2.89E-05	5.91E-05
Acetaldehyde						4.00E-05	5.19E-02	5.19E-02	7.41E-05				8.13E-04	5.27E-02
Acrolein						6.40E-06	8.30E-03	8.30E-03	2.32E-05				1.10E-04	8.41E-03
Anthracene									3.62E-06		8.13E-09	1.45E-04	5.03E-06	1.50E-04
Benzo(a)anthracene									1.83E-06		2.67E-08	4.78E-04	3.26E-06	4.81E-04
Benzene		5.50E-05	2.18E-01	5.50E-05	6.08E-02	1.20E-05	1.56E-02	6.08E-02	2.28E-03		1.43E-06	2.55E-02	2.92E-03	3.07E-01
Benzo(a)pyrene									7.55E-07				6.69E-07	6.69E-07
Benzo(b)fluoranthene									3.26E-06				2.89E-06	2.89E-06
Benzo(b,k)fluoranthene											9.87E-09	1.76E-04	1.64E-07	1.76E-04
Benzo(g,h,i)perylene									1.63E-06		1.51E-08	2.69E-04	1.92E-06	2.71E-04
Benzo(k)fluoranthene									6.41E-07				5.67E-07	5.67E-07
Chrysene									4.50E-06		1.59E-08	2.83E-04	4.32E-06	2.88E-04
Dibenzo(a,h)anthracene									1.02E-06		1.11E-08	1.99E-04	1.46E-06	2.00E-04
Ethylbenzene						3.20E-05	4.15E-02	4.15E-02			4.24E-07	7.58E-03		4.91E-02
Fluoranthene									1.18E-05		3.23E-08	5.77E-04	1.78E-05	5.94E-04
Fluorene									3.76E-05		2.98E-08	5.32E-04	6.13E-05	5.94E-04
Formaldehyde		2.31E-04	9.15E-01	2.31E-04	2.55E-01	2.19E-04	2.84E-01	2.84E-01	2.32E-04		2.20E-04	3.93E+00	1.36E-03	5.13E+00
Indeno(1,2,3-cd)pyrene									1.22E-06		1.43E-08	2.55E-04	1.44E-06	2.56E-04
Naphtalene		3.50E-05	1.39E-01	3.50E-05	3.87E-02	1.30E-06	1.69E-03	3.87E-02						1.77E-01
Total PAHs		4.00E-05	1.58E-01	4.00E-05	4.42E-02	2.20E-06	2.85E-03	4.42E-02	3.82E-04		8.67E-06	1.55E-01	5.02E-04	3.58E-01
OCDD											2.07E-11	3.69E-07		3.69E-07
Phenanathrene									1.20E-04		7.00E-08	1.25E-03	1.34E-04	1.38E-03
Propylene														
Pyrene									1.09E-05		2.83E-08	5.06E-04	1.43E-05	5.21E-04
Toluene						1.30E-04	1.69E-01	1.69E-01	8.26E-04		4.13E-05	7.39E-01	1.13E-03	9.08E-01
Xylene						6.40E-05	8.30E-02	8.30E-02	5.67E-04		7.27E-07	1.30E-02	7.82E-04	9.68E-02
Arsenic	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01

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Future Potential Emissions - Palo Seco Power Plant

Pollutant	Emissions From PSGT 1-1, 1-2, and 2-1: AP-42 04/00 - GT Fuel Oil Table 3.1-4 for Organics Fuel Sample Metals			Emissions From New FT8 Combustion Turbines: Vendor Specs Criteria Pollutants. AP-42 04/00 - Oil Table 3.1-4 for Organic HAPs. Fuel Sample Metal HAPs		Emissions From New FT8 Combustion Turbines: Vendor Specs Criteria Pollutants. AP-42 04/00 - Gas Table 3.1-3 for Organic HAPs.		Emissions From New FT8 Combustion Turbines	Emissions From New BSGs	Emissions From Units 1-4: AP-42 09/98 - No. 6 Oil Combustion Table 1.3-9 and 1.3-11 No. 6 Fuel Oil Sample for Metals			Emergency Engines	Total Power Plant Emissions
	ppm	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	ton/yr	ton/yr	ppm	lb/MMBtu	ton/yr	ton/yr	(ton/yr)
Antimony	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01
Beryllium	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	0.05	2.69E-06	4.80E-02	8.80E-06	6.05E-02
Cadmium	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	0.05	2.69E-06	4.80E-02	8.80E-06	6.05E-02
Chromium	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	4.00	2.15E-04	3.84E+00	8.80E-06	3.85E+00
Cobalt	0.10	4.93E-06	1.96E-02	4.93E-06	5.45E-03			5.45E-03	1.45E-05	0.30	1.61E-05	2.88E-01	1.76E-05	3.13E-01
Lead	0.20	9.87E-06	3.91E-02	9.87E-06	1.09E-02			1.09E-02	2.90E-05	5.00	2.69E-04	4.80E+00	3.52E-05	4.85E+00
Manganese	0.05	2.47E-06	9.78E-03	2.47E-06	2.73E-03			2.73E-03	7.25E-06	0.05	2.69E-06	4.80E-02	8.80E-06	6.05E-02
Mercury	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01
Nickel	0.10	4.93E-06	1.96E-02	4.93E-06	5.45E-03			5.45E-03	1.45E-05	10.8	5.80E-04	1.04E+01	1.76E-05	1.04E+01
Selenium	0.50	2.47E-05	9.78E-02	2.47E-05	2.73E-02			2.73E-02	7.25E-05	0.50	2.69E-05	4.80E-01	8.80E-05	6.05E-01
Total HAPs		4.70E-04	1.86	4.70E-04	0.52	5.06E-04	0.66	0.66	0.66		1.47E-03	26.27		28.79
Maximum Individual HAP												Nickel		10.39

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Future Potential Emissions - Palo Seco Power Plant

Pollutant	Emissions From PSGT 1-1, 1-2, and 2-1			Emissions From New FT8 Combustion Turbines				Emissions From New FT8 Combustion Turbines	Emissions From New BSGs	Emissions From Units 1-4			Emergency Engines	Total Power Plant Emissions
	AP-42 04/00 - GT Fuel Oil Table 3.1-4 for Organics Fuel Sample Metals			Vendor Specs Criteria Pollutants. AP-42 04/00 - Oil Table 3.1-4 for Organic HAPs. Fuel Sample Metal HAPs		Vendor Specs Criteria Pollutants. AP-42 04/00 - Gas Table 3.1-3 for Organic HAPs.				AP-42 09/98 - No. 6 Oil Combustion Table 1.3-9 and 1.3-11 No. 6 Fuel Oil Sample for Metals				
	ppm	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	ton/yr	ton/yr	ppm	lb/MMBtu	ton/yr	ton/yr	(ton/yr)

Fuel Type	Heat Content		Density lb/gal	Annual Firing Rate			
Distillate Oil (New GTs)	138,000	Btu/gal	6.81	16,020,227	gal/yr	2,210,791	MMBtu/yr
Natural Gas (New GTs)	1,020	Btu/cf	N/A	2,542	MMCF/yr	2,593,341	MMBtu/yr
Distillate Oil (Existing GTs	138,000	Btu/gal	6.81	57,416,087	gal/yr	7,923,420	MMBtu/yr
No. 6 Fuel Oil (Boilers)	150,000	Btu/gal	8.06	238,227,149	gal/yr	35,734,072	MMBtu/yr
Fuel Sulfur (new GTs)		0.05	%				
Fuel Sulfur (existing GTs)		0.50	%				
Fuel Sulfur (Boilers)		0.50	%				

Notes:

1) If results of fuel oil testing indicated that the concentration of a particular metal is below detectable limits, the metal concentration was set to one-half the lowest detectable level.
2) The facility-wide HAP potential emissions is based upon the maximum result by individual HAP and total HAPs for fuel oil and natural gas.
3) For distillate oil firing, PTE based upon existing permit limits, rated firing rate, and 8,760 hr/yr, as applicable.
4) For natural gas firing, PTE based upon vendor emission guarantee rated firing rate, and 8,760 hr/yr, as applicable
5) For natural gas firing, VOC and PM/PM10/PM2.5 emissions based on AP-42, Section 3.1, Table 3.1-1.
6) For natural gas firing, formaldehyde (HCOH) PTE based on vendor guarantee (91 ppbvd).
7) SO2 emissions based upon fuel sulfur content limits
8) HAP PTE, except for HCOH on gas for new CTGs, based on AP-42 Section 3.1, Tables 3.1-1, 3.1-3, 3.1-4, and 3.1-5.
9) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
10) CO2e emissions from 40 CFR 98, Subchapter C, Tables 1 and 2
11) Natural gas and distillate oil throughput limited to keep emissions below PSD signficance threshold.
12) Boilers 1 and 2 potential emissions based upon 8% annual capacity factor for limited use oil units under 40 CFR 63, Subpart UUUUU.

13) Fuel Oil F factor	9190	dsf/MMBtu
14) Natural Gas F factor	8710	dsf/MMBtu
15) From Method 19 - NOx	1.194E-07	lb/scf:ppm
16) From Method 19 - CO	7.270E-08	lb/scf:ppm

Rated Fuel Firing Rates FT8

Fuel Type	MMBtu/hr	
Distillate Oil	283.3	24-hr average
Natural Gas	294.8	24-hr average

1 lb = 7000 grains

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Potential Emissions - Palo Seco Power Plant Black Start Engines

Pollutant	Emissions From BSG-PS-1 609 hp		Emissions From BSG-PS-2 609 hp		Emissions From BSG-PS-3 609 hp		Totals
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.675	1.641	1.675	1.641	1.675	1.641	4.922
CO	0.780	0.764	0.780	0.764	0.780	0.764	2.292
VOC	0.046	0.045	0.046	0.045	0.046	0.045	0.136
PM (filterable only)	0.0370	0.036	0.0370	0.036	0.0370	0.036	0.109
PM10	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
PM2.5	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
SO2	0.0015	0.001	0.0015	0.001	0.0015	0.001	0.004
H2SO4	0.0002	0.000	0.0002	0.000	0.0002	0.000	0.001
CO2e	163.64	160.3	163.64	160.3	163.64	160.3	481.0
1,1,1-Trichloroethane							
1,1-Dichloroethane							
1,2-Dichloroethane							
1,1,2,2,-Tetrachloroethane							
1,1,2-Trichloroethane							
1,3-Butadiene							
1,3-Dichloropropene							
Trimethylbenzenes							
2,2,4-Trimethylpentane							
Acenaphthene	4.68E-06	4.59E-06	4.68E-06	4.59E-06	4.68E-06	4.59E-06	1.38E-05
Acenaphthylene	9.23E-06	9.04E-06	9.23E-06	9.04E-06	9.23E-06	9.04E-06	2.71E-05
Acetaldehyde	2.52E-05	2.47E-05	2.52E-05	2.47E-05	2.52E-05	2.47E-05	7.41E-05
Acrolein	7.88E-06	7.72E-06	7.88E-06	7.72E-06	7.88E-06	7.72E-06	2.32E-05
Anthracene	1.23E-06	1.21E-06	1.23E-06	1.21E-06	1.23E-06	1.21E-06	3.62E-06
Benzo(a)anthracene	6.22E-07	6.09E-07	6.22E-07	6.09E-07	6.22E-07	6.09E-07	1.83E-06
Benzene	7.76E-04	7.60E-04	7.76E-04	7.60E-04	7.76E-04	7.60E-04	2.28E-03
Benzo(a)pyrene	2.57E-07	2.52E-07	2.57E-07	2.52E-07	2.57E-07	2.52E-07	7.55E-07
Benzo(b)fluoranthene	1.11E-06	1.09E-06	1.11E-06	1.09E-06	1.11E-06	1.09E-06	3.26E-06
Benzo(b,k)fluoranthene							
Benzo(e)pyrene							
Benzo(g,h,i)perylene	5.56E-07	5.45E-07	5.56E-07	5.45E-07	5.56E-07	5.45E-07	1.63E-06
Benzo(k)fluoranthene	2.18E-07	2.14E-07	2.18E-07	2.14E-07	2.18E-07	2.14E-07	6.41E-07
Biphenyl							
Carbon Tetrachloride							
Chlorobenzene							
Chloroform							
Chrysene	1.53E-06	1.50E-06	1.53E-06	1.50E-06	1.53E-06	1.50E-06	4.50E-06
Cyclohexane							
Dibenzo(a,h)anthracene	3.46E-07	3.39E-07	3.46E-07	3.39E-07	3.46E-07	3.39E-07	1.02E-06
Ethylbenzene							
Fluoranthene	4.03E-06	3.95E-06	4.03E-06	3.95E-06	4.03E-06	3.95E-06	1.18E-05
Fluorene	1.28E-05	1.25E-05	1.28E-05	1.25E-05	1.28E-05	1.25E-05	3.76E-05
Formaldehyde	7.89E-05	7.73E-05	7.89E-05	7.73E-05	7.89E-05	7.73E-05	2.32E-04
Indeno(1,2,3-cd)pyrene	4.14E-07	4.06E-07	4.14E-07	4.06E-07	4.14E-07	4.06E-07	1.22E-06
Methanol							
Methyl chloride							
Total PAHs	1.30E-04	1.27E-04	1.30E-04	1.27E-04	1.30E-04	1.27E-04	3.82E-04
n-Hexane							

Potential Emissions - Palo Seco Power Plant Black Start Engines

Pollutant	Emissions From BSG-PS-1 609 hp		Emissions From BSG-PS-2 609 hp		Emissions From BSG-PS-3 609 hp		Totals
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.675	1.641	1.675	1.641	1.675	1.641	4.922
CO	0.780	0.764	0.780	0.764	0.780	0.764	2.292
VOC	0.046	0.045	0.046	0.045	0.046	0.045	0.136
PM (filterable only)	0.0370	0.036	0.0370	0.036	0.0370	0.036	0.109
PM10	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
PM2.5	0.0447	0.044	0.0447	0.044	0.0447	0.044	0.131
SO2	0.0015	0.001	0.0015	0.001	0.0015	0.001	0.004
H2SO4	0.0002	0.000	0.0002	0.000	0.0002	0.000	0.001
CO2e	163.64	160.3	163.64	160.3	163.64	160.3	481.0
OCDD							
Perylene							
Phenanathrene	4.08E-05	4.00E-05	4.08E-05	4.00E-05	4.08E-05	4.00E-05	1.20E-04
Phenol							
Pyrene	3.71E-06	3.64E-06	3.71E-06	3.64E-06	3.71E-06	3.64E-06	1.09E-05
Styrene							
Toluene	2.81E-04	2.75E-04	2.81E-04	2.75E-04	2.81E-04	2.75E-04	8.26E-04
Vinyl Chloride							
Xylene	1.93E-04	1.89E-04	1.93E-04	1.89E-04	1.93E-04	1.89E-04	5.67E-04
Arsenic	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Antimony	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Beryllium	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Cadmium	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Chromium	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Cobalt	4.93E-06	4.84E-06	4.93E-06	4.84E-06	4.93E-06	4.84E-06	1.45E-05
Lead	9.87E-06	9.67E-06	9.87E-06	9.67E-06	9.87E-06	9.67E-06	2.90E-05
Manganese	2.47E-06	2.42E-06	2.47E-06	2.42E-06	2.47E-06	2.42E-06	7.25E-06
Mercury	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Nickel	4.93E-06	4.84E-06	4.93E-06	4.84E-06	4.93E-06	4.84E-06	1.45E-05
Selenium	2.47E-05	2.42E-05	2.47E-05	2.42E-05	2.47E-05	2.42E-05	7.25E-05
Total HAPs	**1.70E-03**	**1.67E-03**	**1.70E-03**	**1.67E-03**	**1.70E-03**	**1.67E-03**	**5.00E-03**

Engine firing rate	**28.4**	**gal/hr**	**28.4**	**gal/hr**	**28.4**	**gal/hr**
Engine firing rate	**3.92**	**MMBtu/hr**	**3.92**	**MMBtu/hr**	**3.92**	**MMBtu/hr**
Engine operating hours	**500**	**hr/yr**	**500**	**hr/yr**	**500**	**hr/yr**
Engine annual heat input	**1,960**	**MMBtu/yr**	**1,960**	**MMBtu/yr**	**1,960**	**MMBtu/yr**
Fuel Sulfur	**0.0015**	**%**	**0.0015**	**%**	**0.0015**	**%**

Notes:

1) Organic HAP emissions from AP-42 Section 3.4, Tables 3.4-3 and 3.4-4. Metal HAP emissions from fuel samples
2) NOx, CO, PM (filterable), and VOC (as HC) emissions are from Caterpillar performance specifications
3) PM10/PM2.5 condensable from AP-42, Table 3.4-2
4) SO2 emissions from mass balance and fuel sulfur content
5) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
6) CO2e emissions from 40 CFR 98, Subchapter C, Tables 1 and 2 and GWPs in 40 CFR 98, Subchapter A, Table 1

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Potential Emissions - Palo Seco Power Plant Emergency Engines

Pollutant	Emissions From GE-GIS-PS-1 385 hp		Emissions From B1-PS-1 208 hp		Emissions From GE-PS-1 765 hp		Emissions From GE-PS-2 765 hp		Totals
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.048	0.64	2.492	0.89	3.2	4.16	3.2	4.16	9.85E+00
CO	0.909	0.55	0.831	0.30	0.85	1.11	0.85	1.11	3.06E+00
VOC	0.35	0.21	0.35	0.13	0.0819	0.11	0.0819	0.11	5.51E-01
PM	0.0524	0.03	0.1278	0.05	0.062	0.08	0.062	0.08	2.39E-01
PM10	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
PM2.5	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
SO2	0.0015	0.00	0.0015	0.00	0.5050	0.66	0.5050	0.66	1.32E+00
H2SO4	2.30E-04	1.39E-04	2.30E-04	8.24E-05	7.73E-02	1.01E-01	7.73E-02	1.01E-01	2.01E-01
CO2e	1.64E+02	9.94E+01	1.64E+02	5.87E+01	1.64E+02	2.13E+02	1.64E+02	2.13E+02	5.84E+02
1,1,1-Trichloroethane									
1,1-Dichloroethane									
1,2-Dichloroethane									
1,1,2,2,-Tetrachloroethane									
1,1,2-Trichloroethane									
1,3-Butadiene	3.90E-05	2.37E-05	3.90E-05	1.40E-05					3.77E-05
1,3-Dichloropropene									
Trimethylbenzenes									
2,2,4-Trimethylpentane									
Acenaphthene	1.40E-06	8.50E-07	1.40E-06	5.02E-07	4.68E-06	6.09E-06	4.68E-06	6.09E-06	1.35E-05
Acenaphthylene	5.10E-06	3.10E-06	5.10E-06	1.83E-06	9.23E-06	1.20E-05	9.23E-06	1.20E-05	2.89E-05
Acetaldehyde	7.74E-04	4.70E-04	7.74E-04	2.78E-04	2.52E-05	3.28E-05	2.52E-05	3.28E-05	8.13E-04
Acrolein	9.30E-05	5.65E-05	9.30E-05	3.34E-05	7.88E-06	1.02E-05	7.88E-06	1.02E-05	1.10E-04
Anthracene	1.90E-06	1.15E-06	1.90E-06	6.82E-07	1.23E-06	1.60E-06	1.23E-06	1.60E-06	5.03E-06
Benzo(a)anthracene	1.70E-06	1.03E-06	1.70E-06	6.10E-07	6.22E-07	8.09E-07	6.22E-07	8.09E-07	3.26E-06
Benzene	9.30E-04	5.65E-04	9.30E-04	3.34E-04	7.76E-04	1.01E-03	7.76E-04	1.01E-03	2.92E-03
Benzo(a)pyrene					2.57E-07	3.34E-07	2.57E-07	3.34E-07	6.69E-07
Benzo(b)fluoranthene					1.11E-06	1.44E-06	1.11E-06	1.44E-06	2.89E-06
Benzo(b,k)fluoranthene	1.70E-07	1.03E-07	1.70E-07	6.10E-08					1.64E-07
Benzo(e)pyrene									
Benzo(g,h,i)perylene	4.90E-07	2.98E-07	4.90E-07	1.76E-07	5.56E-07	7.23E-07	5.56E-07	7.23E-07	1.92E-06
Benzo(k)fluoranthene					2.18E-07	2.84E-07	2.18E-07	2.84E-07	5.67E-07
Biphenyl									
Carbon Tetrachloride									
Chlorobenzene									
Chloroform									
Chrysene	3.50E-07	2.13E-07	3.50E-07	1.26E-07	1.53E-06	1.99E-06	1.53E-06	1.99E-06	4.32E-06
Cyclohexane									
Dibenzo(a,h)anthracene	5.80E-07	3.52E-07	5.80E-07	2.08E-07	3.46E-07	4.50E-07	3.46E-07	4.50E-07	1.46E-06
Ethylbenzene									
Fluoranthene	7.60E-06	4.61E-06	7.60E-06	2.73E-06	4.03E-06	5.24E-06	4.03E-06	5.24E-06	1.78E-05
Fluorene	2.90E-05	1.76E-05	2.90E-05	1.04E-05	1.28E-05	1.66E-05	1.28E-05	1.66E-05	6.13E-05
Formaldehyde	1.20E-03	7.29E-04	1.20E-03	4.31E-04	7.89E-05	1.03E-04	7.89E-05	1.03E-04	1.36E-03
Indeno(1,2,3-cd)pyrene	3.80E-07	2.31E-07	3.80E-07	1.36E-07	4.14E-07	5.38E-07	4.14E-07	5.38E-07	1.44E-06
Methanol									
Methyl chloride									
Total PAHs	1.70E-04	1.03E-04	1.70E-04	6.10E-05	1.30E-04	1.69E-04	1.30E-04	1.69E-04	5.02E-04
n-Hexane									
OCDD									
Perylene									
Phenanathrene	2.90E-05	1.76E-05	2.90E-05	1.04E-05	4.08E-05	5.31E-05	4.08E-05	5.31E-05	1.34E-04
Phenol									
Pyrene	4.80E-06	2.91E-06	4.80E-06	1.72E-06	3.71E-06	4.83E-06	3.71E-06	4.83E-06	1.43E-05
Styrene									
Toluene	4.10E-04	2.49E-04	4.10E-04	1.47E-04	2.81E-04	3.65E-04	2.81E-04	3.65E-04	1.13E-03
Vinyl Chloride									
Xylene	2.90E-04	1.76E-04	2.90E-04	1.04E-04	1.93E-04	2.51E-04	1.93E-04	2.51E-04	7.82E-04
Arsenic	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05
Antimony	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05

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Potential Emissions - Palo Seco Power Plant Emergency Engines

Pollutant	Emissions From GE-GIS-PS-1 385 hp		Emissions From B1-PS-1 208 hp		Emissions From GE-PS-1 765 hp		Emissions From GE-PS-2 765 hp		Totals
	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	lb/MMBtu	ton/yr	
NOx	1.048	0.64	2.492	0.89	3.2	4.16	3.2	4.16	9.85E+00
CO	0.909	0.55	0.831	0.30	0.85	1.11	0.85	1.11	3.06E+00
VOC	0.35	0.21	0.35	0.13	0.0819	0.11	0.0819	0.11	5.51E-01
PM	0.0524	0.03	0.1278	0.05	0.062	0.08	0.062	0.08	2.39E-01
PM10	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
PM2.5	0.0601	0.04	0.1355	0.05	0.0573	0.07	0.0573	0.07	2.34E-01
SO2	0.0015	0.00	0.0015	0.00	0.5050	0.66	0.5050	0.66	1.32E+00
H2SO4	2.30E-04	1.39E-04	2.30E-04	8.24E-05	7.73E-02	1.01E-01	7.73E-02	1.01E-01	2.01E-01
CO2e	1.64E+02	9.94E+01	1.64E+02	5.87E+01	1.64E+02	2.13E+02	1.64E+02	2.13E+02	5.84E+02
Beryllium	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06
Cadmium	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06
Chromium	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06
Cobalt	4.93E-06	3.00E-06	4.93E-06	1.77E-06	4.93E-06	6.42E-06	4.93E-06	6.42E-06	1.76E-05
Lead	9.87E-06	5.99E-06	9.87E-06	3.54E-06	9.87E-06	1.28E-05	9.87E-06	1.28E-05	3.52E-05
Manganese	2.47E-06	1.50E-06	2.47E-06	8.85E-07	2.47E-06	3.21E-06	2.47E-06	3.21E-06	8.80E-06
Mercury	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05
Nickel	4.93E-06	3.00E-06	4.93E-06	1.77E-06	4.93E-06	6.42E-06	4.93E-06	6.42E-06	1.76E-05
Selenium	2.47E-05	1.50E-05	2.47E-05	8.85E-06	2.47E-05	3.21E-05	2.47E-05	3.21E-05	8.80E-05
Total HAPs	**4.12E-03**	**2.50E-03**	**4.12E-03**	**1.48E-03**	**1.70E-03**	**2.21E-03**	**1.70E-03**	**2.21E-03**	**8.40E-03**

Engine firing rate	**17.6**	**gal/hr**	**10.4**	**gal/hr**	**37.7**	**gal/hr**	**37.7**	**gal/hr**
Engine operating hours	**500**	**hr/yr**	**500**	**hr/yr**	**500**	**hr/yr**	**500**	**hr/yr**
Engine annual heat input	**1,214**	**MMBtu/yr**	**718**	**MMBtu/yr**	**2,601**	**MMBtu/yr**	**2,601**	**MMBtu/yr**
Fuel Sulfur	**0.0015**	**%**	**0.0015**	**%**	**0.50**	**%**	**0.50**	**%**

Notes:

1) Organic HAP emissions from diesel engines rated <600 hp from AP-42 Section 3.3, Table 3.3-2. Metal HAP emissions from fuel samples
2) Organic HAP emissions from diesel engines rated >600 hp from AP-42 Section 3.4, Tables 3.4-3 and 3.4-4. Metal HAP emissions from fuel samples
3) HAP emisisons from propane engine from AP-42 Section 3.2, Table 3.2-2.
4) NOx, CO, and PM (filterable) emissions are from 40 CFR 60 NSPS Subpart IIII for GE-GIS-PS-1 and B1-PS-1
5) VOC from AP-42 Tables 3.3-1 and 3.4-1
6) SO2 emissions from mass balance and fuel sulfur content
7) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
8) CO2e emissions from 40 CFR 98, Subchapter C, Tables 1 and 2

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Potential Emissions - Palo Seco Natural Gas Handling System Fugitive Emissions

Emission Factors	
Source Type	**Gas (kg/hr/source)**
Flanges (Vapor)	0.00039
Flanges (Liquid)	0.00011
Valves (Vapor)	0.0045
Others (compressors, drains, instruments, meters, PSVs, vents) (Vapor)	0.0088

Emission factors are from EPA's "Protocol for Equipment Leak Emissions Estimates" Table 2-4 (November 1995)

Potential Emissions					
Source Type	**Source Type Used**	**Count**	**All Gas (tpy)**	**VOC (tpy)**	**GHG (tpy)**
Flange (Vapor)	Flanges	38	0.143	0.014	3.2
Flange (Liquid)	Flanges	20	0.021	0.002	0.5
Valves (Vapor)	Valves	53	2.303	0.230	51.8
Vents, Drains, PIs, Lis, PSVs (Vapor)	Others	36	3.060	0.306	68.8
TOTALS			**5.53**	**0.55**	**124.4**
LNG estimated to have combined methane and ethane content >95% but emissions conservatively assume a VOC content of 10 percent.					
GHG emissions based upon all non-VOC emissions being methane with a global warmng potential of 25 (see 40 CFR 98, Subpart A, Table A-1)					

$$GHG\left(\frac{ton}{year}\right) = [All\ gas\left(\frac{ton}{year}\right) - VOC\left(\frac{ton}{year}\right)]\ X\ 25$$

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LIC. #17776
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PREPA Palo Seco

Proposed Compliance Emissions Tracking - Pratt & Whitney FT8 Combustion Turbine Project

The two limiting pollutants to net out of PSD are CO for gas firing and PM2.5 for oil firing to avoid PSD. A simple fuel cap can be assumed if only one fuel is fired in any year, however in a typical year will likely include firing of both fuels. To account for this, the following compliance mechanism will be implemented to ensure that the emissions of all pollutants remain below the proposed emission caps to ensure that the Project nets out of PSD.

PREPA shall track daily fuel usage and emissions.
The daily emissions shall be used to calculate rolling 365-day emissins

NOx:

$$NOx\left(\frac{ton}{day}\right) + NOx\ Total\ tons\ (364\ previous\ days) < 753.4\ tons\ 365\ days\ rolling$$

$$NOx\left(\frac{ton}{day}\right) = [NSPS\ Subpart\ KKKK\ Limit\left(\frac{1.2\ lb}{MW-hr}\right)X\ USNG\left(\frac{MW-hr}{day}\right) + NSPS\ Subpart\ KKKK\ Limit\left(\frac{3.6\ lb}{MW-hr}\right)X\ USdiesel\left(\frac{MW-hr}{day}\right)] \div 2{,}000\ lb/ton$$

CO:

$$CO\left(\frac{ton}{day}\right) + CO\ Total\ tons\ (364\ previous\ days) < 99.4\ tons\ 365\ days\ rolling$$

$$CO\left(\frac{ton}{day}\right) = [0.0767\left(\frac{lb}{MMBtu}\right)X\ USNG\left(\frac{MMBtu}{day}\right) + 0.0343\left(\frac{lb}{MMBtu}\right)X\ USdiesel\left(\frac{MMBtu}{day}\right)] \div 2{,}000\ lb/ton$$

PM:

$$PM\left(\frac{ton}{day}\right) + PM\ Total\ tons\ (364\ previous\ days) < 34.6\ tons\ 365\ days\ rolling$$

$$PM\left(\frac{ton}{day}\right) = [0.010\left(\frac{lb}{MMBtu}\right)X\ USNG\left(\frac{MMBtu}{day}\right) + 0.0177\left(\frac{lb}{MMBtu}\right)X\ USdiesel\left(\frac{MMBtu}{day}\right)] \div 2{,}000\ lb/ton$$

PM10:

$$PM10\left(\frac{ton}{day}\right) + PM10\ Total\ tons\ (364\ previous\ days) < 24.6\ tons\ 365\ days\ rolling$$

$$PM10\left(\frac{ton}{day}\right) = [0.010\left(\frac{lb}{MMBtu}\right)X\ USNG\left(\frac{MMBtu}{day}\right) + 0.0177\left(\frac{lb}{MMBtu}\right)X\ USdiesel\left(\frac{MMBtu}{day}\right)] \div 2{,}000\ lb/ton$$

PM2.5:

$$PM2.5\left(\frac{ton}{day}\right) + PM2.5\ Total\ tons\ (364\ previous\ days) < 19.6\ tons\ 365\ days\ rolling$$

$$PM2.5\left(\frac{ton}{day}\right) = [0.010\left(\frac{lb}{MMBtu}\right)X\ USNG\left(\frac{MMBtu}{day}\right) + 0.0177\left(\frac{lb}{MMBtu}\right)X\ USdiesel\left(\frac{MMBtu}{day}\right)] \div 2{,}000\ lb/ton$$

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VOC:

$$VOC\left(\frac{ton}{day}\right) + VOC\ Total\ tons\ (364\ previous\ days) < 40.1\ tons\ 365\ days\ rolling$$

$$VOC\left(\frac{ton}{day}\right) = [0.0051\left(\frac{lb}{MMBtu}\right) X\ USNG\left(\frac{MMBtu}{day}\right) + 0.0071\left(\frac{lb}{MMBtu}\right) X\ USdiesel\left(\frac{MMBtu}{day}\right)] \div 2{,}000\ lb/ton$$

SO2:

$$SO2\left(\frac{ton}{day}\right) + SO2\ Total\ tons\ (364\ previous\ days) < 59.7\ tons\ 365\ days\ rolling$$

$$SO2\left(\frac{ton}{day}\right) = [NG\left(\frac{gr\ S}{100\ dscf}\right) X\left(\frac{1\ lb}{7{,}000\ gr}\right) X\left(\frac{1\ dscf}{1{,}020\ Btu}\right) X\left(\frac{1x10^6\ Btu}{MMBtu}\right) X\ USNG\left(\frac{MMBtu}{day}\right) +$$

$$Diesel\ wt\%\ S\ X\ Diesel\ gals\ X\left(\frac{7.05\ lb}{gal}\right) X\ USDiesel\left(\frac{MMBtu}{day}\right)] X\left(\frac{2\ lb\ SO2}{lb\ S}\right) \div 2{,}000\ lb/ton$$

H2SO4:

$$H2SO4\left(\frac{ton}{day}\right) + H2SO4\ Total\ tons\ (364\ previous\ days) < 9.9\ tons\ 365\ days\ rolling$$

$$H2SO4\left(\frac{ton}{day}\right) = SO2\left(\frac{ton}{day}\right) x\ \frac{98\ lb\ H2SO4}{64\ lb\ SO2}\ x\ 10\%$$

GHGs:

$$GHG\left(\frac{ton}{day}\right) + GHG\ Total\ tons\ (364\ previous\ days) < 208{,}115\ tons\ 365\ days\ rolling$$

$$GHG\left(\frac{ton}{day}\right) = [117.12\left(\frac{lb}{MMBtu}\right) X\ USNG\left(\frac{MMBtu}{day}\right) + 163.64\left(\frac{lb}{MMBtu}\right) X\ USdiesel\left(\frac{MMBtu}{day}\right)] \div 2{,}000\ lb/ton$$

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Baseline Emissions

Month	PSGT 2-2, 3-1, and 3-2 Oil Consumption (bbls)	% Sulfur	NOx (tons)	NOx 24-month (tpy)	PM/PM10/PM2.5 (tons)	PM/PM10/PM2.5 24-month (tpy)	SO2 (tons)	SO2 24-month (tpy)	H2SO4 (tons)	H2SO4 24-month (tpy)	CO (tons)	CO 24-month (tpy)	VOC (tons)	VOC 24-month (tpy)	GHGs (tons)	GHGs 24-month (tpy)
2009	**13,212.0**	**0.040**														
Jan	215.7	0.040	0.55		0.01		0.03		0.00		0.00		0.00		102.27	
Feb	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Mar	56.7	0.040	0.14		0.00		0.01		0.00		0.00		0.00		26.87	
Apr	113.8	0.040	0.29		0.00		0.01		0.00		0.00		0.00		53.98	
May	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Jun	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Jul	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Aug	2,813.5	0.025	7.17		0.10		0.21		0.03		0.03		0.00		1,334.23	
Sep	2,655.0	0.020	6.77		0.09		0.16		0.02		0.03		0.00		1,259.09	
Oct	7,357.4	0.018	18.76		0.26		0.39		0.06		0.07		0.01		3,489.12	
Nov	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Dec	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
2010	**12,979.4**	**0.024**														
Jan	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Feb	3,040.1	0.020	7.75		0.11		0.17		0.03		0.03		0.00		1,441.73	
Mar	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Apr	100.0	0.020	0.25		0.00		0.01		0.00		0.00		0.00		47.41	
May	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Jun	2,580.2	0.024	6.58		0.09		0.18		0.03		0.02		0.00		1,223.63	
Jul	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Aug	4,069.6	0.024	10.38		0.14		0.28		0.04		0.04		0.00		1,929.93	
Sep	3,189.4	0.020	8.13		0.11		0.19		0.03		0.03		0.00		1,512.53	
Oct	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Nov	0.0	0.000	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Dec	0.0	0.000	0.00	33.40	0.00	0.46	0.00	0.81	0.00	0.12	0.00	0.13	0.00	0.02	0.00	6,210.40
2011	**7,956.4**	**0.020**														
Jan	0.0	0.000	0.00	33.12	0.00	0.45	0.00	0.80	0.00	0.12	0.00	0.12	0.00	0.02	0.00	6,159.27
Feb	0.0	0.000	0.00	33.12	0.00	0.45	0.00	0.80	0.00	0.12	0.00	0.12	0.00	0.02	0.00	6,159.27
Mar	476.9	0.020	1.22	33.66	0.02	0.46	0.03	0.81	0.00	0.12	0.00	0.13	0.00	0.02	226.18	6,258.92
Apr	0.0	0.000	0.00	33.51	0.00	0.46	0.00	0.81	0.00	0.12	0.00	0.13	0.00	0.02	0.00	6,231.93
May	0.0	0.000	0.00	33.51	0.00	0.46	0.00	0.81	0.00	0.12	0.00	0.13	0.00	0.02	0.00	6,231.93
Jun	0.0	0.000	0.00	33.51	0.00	0.46	0.00	0.81	0.00	0.12	0.00	0.13	0.00	0.02	0.00	6,231.93
Jul	0.0	0.000	0.00	33.51	0.00	0.46	0.00	0.81	0.00	0.12	0.00	0.13	0.00	0.02	0.00	6,231.93
Aug	2,799.2	0.020	7.14	33.49	0.10	0.46	0.16	0.78	0.03	0.12	0.03	0.13	0.00	0.02	1,327.48	6,228.55
Sep	1,148.2	0.020	2.93	31.57	0.04	0.43	0.07	0.74	0.01	0.11	0.01	0.12	0.00	0.01	544.52	5,871.27
Oct	3,532.0	0.020	9.01	26.70	0.12	0.36	0.21	0.65	0.03	0.10	0.03	0.10	0.00	0.01	1,675.01	4,964.22
Nov	0.0	0.000	0.00	26.70	0.00	0.36	0.00	0.65	0.00	0.10	0.00	0.10	0.00	0.01	0.00	4,964.22
Dec	0.0	0.000	0.00	26.70	0.00	0.36	0.00	0.65	0.00	0.10	0.00	0.10	0.00	0.01	0.00	4,964.22
2012	**11,064.7**	**0.020**														
Jan	0.0	0.000	0.00	26.70	0.00	0.36	0.00	0.65	0.00	0.10	0.00	0.10	0.00	0.01	0.00	4,964.22
Feb	9,971.2	0.010	25.43	35.53	0.35	0.48	0.29	0.71	0.04	0.11	0.10	0.13	0.01	0.02	4,728.65	6,607.67
Mar	0.0	0.000	0.00	35.53	0.00	0.48	0.00	0.71	0.00	0.11	0.00	0.13	0.00	0.02	0.00	6,607.67
Apr	0.0	0.000	0.00	35.41	0.00	0.48	0.00	0.71	0.00	0.11	0.00	0.13	0.00	0.02	0.00	6,583.97
May	0.0	0.000	0.00	35.41	0.00	0.48	0.00	0.71	0.00	0.11	0.00	0.13	0.00	0.02	0.00	6,583.97
Jun	920.7	0.020	2.35	33.29	0.03	0.45	0.05	0.64	0.01	0.10	0.01	0.12	0.00	0.02	436.61	6,190.46
Jul	0.0	0.000	0.00	33.29	0.00	0.45	0.00	0.64	0.00	0.10	0.00	0.12	0.00	0.02	0.00	6,190.46
Aug	0.0	0.000	0.00	28.10	0.00	0.38	0.00	0.50	0.00	0.08	0.00	0.11	0.00	0.01	0.00	5,225.49
Sep	172.9	0.010	0.44	24.25	0.01	0.33	0.01	0.41	0.00	0.06	0.00	0.09	0.00	0.01	81.98	4,510.21
Oct	0.0	0.000	0.00	24.25	0.00	0.33	0.00	0.41	0.00	0.06	0.00	0.09	0.00	0.01	0.00	4,510.21
Nov	0.0	0.000	0.00	24.25	0.00	0.33	0.00	0.41	0.00	0.06	0.00	0.09	0.00	0.01	0.00	4,510.21

AP-42 Section 3.1 Emission Factors (lb/MMBtu): NOx = 0.88; PM = 0.012; SO2 = 1.01 x %S; CO = 0.0033; VOC = 0.00041

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Baseline Emissions

Month	PSGT 2-2, 3-1, and 3-2 Oil Consumption (bbls)	% Sulfur	NOx		PM/PM10/PM2.5		SO2		H2SO4		CO		VOC		GHGs	
			(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)
Dec	0.0	0.000	0.00	24.25	0.00	0.33	0.00	0.41	0.00	0.06	0.00	0.09	0.00	0.01	0.00	4,510.21
2013	**8,759.6**	**0.020**														
Jan	0.0	0.000	0.00	24.25	0.00	0.33	0.00	0.41	0.00	0.06	0.00	0.09	0.00	0.01	0.00	4,510.21
Feb	7,162.7	0.020	18.27	33.39	0.25	0.46	0.41	0.61	0.06	0.09	0.07	0.13	0.01	0.02	3,396.78	6,208.60
Mar	0.0	0.000	0.00	32.78	0.00	0.45	0.00	0.60	0.00	0.09	0.00	0.12	0.00	0.02	0.00	6,095.51
Apr	0.0	0.000	0.00	32.78	0.00	0.45	0.00	0.60	0.00	0.09	0.00	0.12	0.00	0.02	0.00	6,095.51
May	0.0	0.000	0.00	32.78	0.00	0.45	0.00	0.60	0.00	0.09	0.00	0.12	0.00	0.02	0.00	6,095.51
Jun	0.0	0.000	0.00	32.78	0.00	0.45	0.00	0.60	0.00	0.09	0.00	0.12	0.00	0.02	0.00	6,095.51
Jul	139.2	0.020	0.36	32.96	0.00	0.45	0.01	0.60	0.00	0.09	0.00	0.12	0.00	0.02	66.02	6,128.52
Aug	0.0	0.000	0.00	29.39	0.00	0.40	0.00	0.52	0.00	0.08	0.00	0.11	0.00	0.01	0.00	5,464.78
Sep	1,457.7	0.020	3.72	29.78	0.05	0.41	0.09	0.53	0.01	0.08	0.01	0.11	0.00	0.01	691.30	5,538.17
Oct	0.0	0.000	0.00	25.28	0.00	0.34	0.00	0.43	0.00	0.07	0.00	0.09	0.00	0.01	0.00	4,700.66
Nov	0.0	0.000	0.00	25.28	0.00	0.34	0.00	0.43	0.00	0.07	0.00	0.09	0.00	0.01	0.00	4,700.66
Dec	0.0	0.000	0.00	25.28	0.00	0.34	0.00	0.43	0.00	0.07	0.00	0.09	0.00	0.01	0.00	4,700.66
2014	**119,480.3**	**0.020**														
Jan	0.0	0.000	0.00	25.28	0.00	0.34	0.00	0.43	0.00	0.07	0.00	0.09	0.00	0.01	0.00	4,700.66
Feb	0.0	0.000	0.00	12.56	0.00	0.17	0.00	0.28	0.00	0.04	0.00	0.05	0.00	0.01	0.00	2,336.34
Mar	545.1	0.020	1.39	13.26	0.02	0.18	0.03	0.30	0.00	0.05	0.01	0.05	0.00	0.01	258.50	2,465.59
Apr	1,662.5	0.020	4.24	15.38	0.06	0.21	0.10	0.35	0.01	0.05	0.02	0.06	0.00	0.01	788.43	2,859.81
May	10,213.0	0.018	26.05	28.40	0.36	0.39	0.53	0.61	0.08	0.09	0.10	0.11	0.01	0.01	4,843.33	5,281.47
Jun	7,112.5	0.020	18.14	36.30	0.25	0.49	0.42	0.79	0.06	0.12	0.07	0.14	0.01	0.02	3,372.99	6,749.66
Jul	16,711.2	0.019	42.62	57.61	0.58	0.79	0.91	1.25	0.14	0.19	0.16	0.22	0.02	0.03	7,925.00	10,712.16
Aug	52,615.4	0.017	134.18	124.70	1.83	1.70	2.68	2.59	0.41	0.40	0.50	0.47	0.06	0.06	24,951.94	23,188.14
Sep	16,883.6	0.010	43.06	146.00	0.59	1.99	0.47	2.83	0.07	0.43	0.16	0.55	0.02	0.07	8,006.75	27,150.52
Oct	9,729.2	0.010	24.81	158.41	0.34	2.16	0.27	2.96	0.04	0.45	0.09	0.59	0.01	0.07	4,613.90	29,457.47
Nov	3,212.0	0.011	8.19	162.51	0.11	2.22	0.10	3.01	0.02	0.46	0.03	0.61	0.00	0.08	1,523.23	30,219.09
Dec	795.9	0.010	2.03	163.52	0.03	2.23	0.02	3.02	0.00	0.46	0.01	0.61	0.00	0.08	377.42	30,407.80
2015	**186,089.6**	**0.022**														
Jan	464.9	0.010	1.19	164.11	0.02	2.24	0.01	3.03	0.00	0.46	0.00	0.62	0.00	0.08	220.48	30,518.04
Feb	691.1	0.010	1.76	155.86	0.02	2.13	0.02	2.83	0.00	0.43	0.01	0.58	0.00	0.07	327.75	28,983.52
Mar	1,434.7	0.010	3.66	157.69	0.05	2.15	0.04	2.86	0.01	0.44	0.01	0.59	0.00	0.07	680.39	29,323.72
Apr	5,283.3	0.010	13.47	164.43	0.18	2.24	0.16	2.93	0.02	0.45	0.05	0.62	0.01	0.08	2,505.52	30,576.48
May	1,276.5	0.010	3.26	166.06	0.04	2.26	0.04	2.95	0.01	0.45	0.01	0.62	0.00	0.08	605.37	30,879.16
Jun	9,074.1	0.011	23.14	177.63	0.32	2.42	0.29	3.10	0.04	0.47	0.09	0.67	0.01	0.08	4,303.25	33,030.79
Jul	10,688.6	0.010	27.26	191.08	0.37	2.61	0.31	3.25	0.05	0.50	0.10	0.72	0.01	0.09	5,068.88	35,532.22
Aug	5,933.8	0.010	15.13	198.64	0.21	2.71	0.17	3.33	0.03	0.51	0.06	0.74	0.01	0.09	2,814.00	36,939.22
Sep	52,771.5	0.015	134.58	264.08	1.84	3.60	2.32	4.45	0.36	0.68	0.50	0.99	0.06	0.12	25,025.98	49,106.55
Oct	31,689.0	0.022	80.81	304.48	1.10	4.15	2.05	5.47	0.31	0.84	0.30	1.14	0.04	0.14	15,027.97	56,620.54
Nov	22,427.0	0.020	57.19	333.08	0.78	4.54	1.34	6.14	0.21	0.94	0.21	1.25	0.03	0.16	10,635.62	61,938.35
Dec	44,355.0	0.022	113.12	389.64	1.54	5.31	2.91	7.60	0.45	1.16	0.42	1.46	0.05	0.18	21,034.60	72,455.65
2016	**181,283.1**	**0.030**														
Jan	14,543.0	0.021	37.09	408.18	0.51	5.57	0.89	8.04	0.14	1.23	0.14	1.53	0.02	0.19	6,896.77	75,904.03
Feb	6,276.0	0.021	16.01	416.19	0.22	5.68	0.38	8.23	0.06	1.26	0.06	1.56	0.01	0.19	2,976.29	77,392.17
Mar	18,228.0	0.020	46.49	438.73	0.63	5.98	1.07	8.76	0.16	1.34	0.17	1.65	0.02	0.20	8,644.32	81,585.08
Apr	10,584.0	0.020	26.99	450.11	0.37	6.14	0.61	9.01	0.09	1.38	0.10	1.69	0.01	0.21	5,019.28	83,700.51
May	17,539.0	0.019	44.73	459.45	0.61	6.27	1.00	9.24	0.15	1.42	0.17	1.72	0.02	0.21	8,317.57	85,437.63
Jun	5,438.0	0.020	13.87	457.32	0.19	6.24	0.32	9.20	0.05	1.41	0.05	1.71	0.01	0.21	2,578.88	85,040.57
Jul	46,750.0	0.030	119.22	495.62	1.63	6.76	4.13	10.81	0.63	1.65	0.45	1.86	0.06	0.23	22,170.39	92,163.26
Aug	39,045.0	0.022	99.57	478.31	1.36	6.52	2.56	10.74	0.39	1.64	0.37	1.79	0.05	0.22	18,516.42	88,945.50
Sep	17,341.0	0.021	44.22	478.90	0.60	6.53	1.09	11.05	0.17	1.69	0.17	1.80	0.02	0.22	8,223.67	89,053.96
Oct	5,136.3	0.016	13.10	473.04	0.18	6.45	0.24	11.03	0.04	1.69	0.05	1.77	0.01	0.22	2,435.78	87,964.90

AP-42 Section 3.1 Emission Factors (lb/MMBtu): NOx = 0.88; PM = 0.012; SO2 = 1.01 x %S; CO = 0.0033; VOC = 0.00041

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Baseline Emissions

			NOx		PM/PM10/PM2.5		SO2		H2SO4		CO		VOC		GHGs	
Month	PSGT 2-2, 3-1, and 3-2 Oil Consumption (bbls)	% Sulfur	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)	(tons)	24-month (tpy)
Nov	159.6	0.016	0.41	469.15	0.01	6.40	0.01	10.99	0.00	1.68	0.00	1.76	0.00	0.22	75.70	87,241.14
Dec	243.2	0.016	0.62	468.44	0.01	6.39	0.01	10.98	0.00	1.68	0.00	1.76	0.00	0.22	115.35	87,110.10
2017	**300,672.4**	**0.045**														
Jan	3,072.0	0.016	7.83	471.77	0.11	6.43	0.14	11.05	0.02	1.69	0.03	1.77	0.00	0.22	1,456.86	87,728.29
Feb	4,567.4	0.016	11.65	476.71	0.16	6.50	0.21	11.14	0.03	1.71	0.04	1.79	0.01	0.22	2,166.01	88,647.43
Mar	1,700.4	0.013	4.34	477.05	0.06	6.51	0.07	11.15	0.01	1.71	0.02	1.79	0.00	0.22	806.40	88,710.43
Apr	6,686.6	0.013	17.05	478.84	0.23	6.53	0.26	11.21	0.04	1.72	0.06	1.80	0.01	0.22	3,171.02	89,043.18
May	12,826.8	0.010	32.71	493.57	0.45	6.73	0.38	11.38	0.06	1.74	0.12	1.85	0.02	0.23	6,082.90	91,781.95
Jun	20,716.7	0.006	52.83	508.41	0.72	6.93	0.37	11.42	0.06	1.75	0.20	1.91	0.02	0.24	9,824.55	94,542.60
Jul	27,821.3	0.004	70.95	530.26	0.97	7.23	0.34	11.43	0.05	1.75	0.27	1.99	0.03	0.25	13,193.78	98,605.05
Aug	54,325.2	0.007	138.54	591.96	1.89	8.07	1.10	11.90	0.17	1.82	0.52	2.22	0.06	0.28	25,762.78	110,079.44
Sep	30,986.9	0.027	79.02	564.19	1.08	7.69	2.43	11.95	0.37	1.83	0.30	2.12	0.04	0.26	14,694.99	104,913.95
Oct	44,144.4	0.034	112.58	580.07	1.54	7.91	4.39	13.13	0.67	2.01	0.42	2.18	0.05	0.27	20,934.73	107,867.33
Nov	48,381.8	0.045	123.39	613.16	1.68	8.36	6.38	15.64	0.98	2.40	0.46	2.30	0.06	0.29	22,944.22	114,021.63
Dec	45,442.8	0.036	115.89	614.55	1.58	8.38	4.84	16.61	0.74	2.54	0.43	2.30	0.05	0.29	21,550.47	114,279.57
2018	**163,433.8**	**0.032**														
Jan	46,933.0	0.032	119.69	655.85	1.63	8.94	4.39	18.36	0.67	2.81	0.45	2.46	0.06	0.31	22,257.15	121,959.76
Feb	41,449.7	0.019	105.71	700.70	1.44	9.56	2.31	19.33	0.35	2.96	0.40	2.63	0.05	0.33	19,656.80	130,300.01
Mar	24,675.0	0.024	62.93	708.92	0.86	9.67	1.76	19.67	0.27	3.01	0.24	2.66	0.03	0.33	11,701.68	131,828.69
Apr	18,039.1	0.018	46.00	718.43	0.63	9.80	0.93	19.83	0.14	3.04	0.17	2.69	0.02	0.33	8,554.75	133,596.43
May	6,210.3	0.014	15.84	703.98	0.22	9.60	0.25	19.46	0.04	2.98	0.06	2.64	0.01	0.33	2,945.12	130,910.21
Jun	2,091.9	0.022	5.33	699.72	0.07	9.54	0.14	19.37	0.02	2.97	0.02	2.62	0.00	0.33	992.06	130,116.80
Jul	4,691.7	0.027	11.96	646.09	0.16	8.81	0.38	17.49	0.06	2.68	0.04	2.42	0.01	0.30	2,224.95	120,144.08
Aug	8,599.4	0.029	21.93	607.27	0.30	8.28	0.73	16.58	0.11	2.54	0.08	2.28	0.01	0.28	4,078.11	112,924.93
Sep	290.6	0.028	0.74	585.53	0.01	7.98	0.02	16.05	0.00	2.46	0.00	2.20	0.00	0.27	137.82	108,882.00
Oct	1,224.1	0.028	3.12	580.54	0.04	7.92	0.10	15.98	0.02	2.45	0.01	2.18	0.00	0.27	580.53	107,954.38
Nov	5,820.9	0.024	14.84	587.76	0.20	8.01	0.41	16.18	0.06	2.48	0.06	2.20	0.01	0.27	2,760.46	109,296.76
Dec	3,408.1	0.018	8.69	591.79	0.12	8.07	0.18	16.26	0.03	2.49	0.03	2.22	0.00	0.28	1,616.21	110,047.19
2019	**2,606.1**	**0.018**														
Jan	0.0	0.000	0.00	587.87	0.00	8.02	0.00	16.19	0.00	2.48	0.00	2.20	0.00	0.27	0.00	109,318.76
Feb	78.2	0.018	0.20	582.15	0.00	7.94	0.00	16.09	0.00	2.46	0.00	2.18	0.00	0.27	37.09	108,254.30
Mar	767.4	0.018	1.96	580.96	0.03	7.92	0.04	16.07	0.01	2.46	0.01	2.18	0.00	0.27	363.94	108,033.07
Apr	1,760.5	0.017	4.49	574.68	0.06	7.84	0.09	15.99	0.01	2.45	0.02	2.16	0.00	0.27	834.89	106,865.00

EFRAN PAREDES MAISONET
INGENIERO LICENCIADO
LIC #17776
PUERTO RICO

AP-42 Section 3.1 Emission Factors (lb/MMBtu): NOx = 0.88; PM = 0.012; SO2 = 1.01 x %S; CO = 0.0033; VOC = 0.00041

11/12/2019

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data				
Plant	**Unit ID**	**Month**	**Oil Consumption (bbls)**	**Sulfur (%)**
Palo Seco	PSGT2-2	Jan-09	0.00	0.0000
Palo Seco	PSGT3-1	Jan-09	82.10	0.0400
Palo Seco	PSGT3-2	Jan-09	133.55	0.0400
Palo Seco	PSGT2-2	Feb-09	0.00	0.0000
Palo Seco	PSGT3-1	Feb-09	0.00	0.0000
Palo Seco	PSGT3-2	Feb-09	0.00	0.0000
Palo Seco	PSGT2-2	Mar-09	56.67	0.0400
Palo Seco	PSGT3-1	Mar-09	0.00	0.0000
Palo Seco	PSGT3-2	Mar-09	0.00	0.0000
Palo Seco	PSGT2-2	Apr-09	0.00	0.0000
Palo Seco	PSGT3-1	Apr-09	113.83	0.0000
Palo Seco	PSGT3-2	Apr-09	0.00	0.0400
Palo Seco	PSGT2-2	May-09	0.00	0.0000
Palo Seco	PSGT3-1	May-09	0.00	0.0000
Palo Seco	PSGT3-2	May-09	0.00	0.0000
Palo Seco	PSGT2-2	Jun-09	0.00	0.0000
Palo Seco	PSGT3-1	Jun-09	0.00	0.0000
Palo Seco	PSGT3-2	Jun-09	0.00	0.0000
Palo Seco	PSGT2-2	Jul-09	0.00	0.0000
Palo Seco	PSGT3-1	Jul-09	0.00	0.0000
Palo Seco	PSGT3-2	Jul-09	0.00	0.0000
Palo Seco	PSGT2-2	Aug-09	1,793.90	0.0250
Palo Seco	PSGT3-1	Aug-09	1,019.55	0.0250
Palo Seco	PSGT3-2	Aug-09	0.00	0.0250
Palo Seco	PSGT2-2	Sep-09	1,048.52	0.0200
Palo Seco	PSGT3-1	Sep-09	387.29	0.0200
Palo Seco	PSGT3-2	Sep-09	1,219.19	0.0200
Palo Seco	PSGT2-2	Oct-09	2,634.81	0.0180
Palo Seco	PSGT3-1	Oct-09	2,608.07	0.0180
Palo Seco	PSGT3-2	Oct-09	2,114.52	0.0180
Palo Seco	PSGT2-2	Nov-09	0.00	0.0000
Palo Seco	PSGT3-1	Nov-09	0.00	0.0000
Palo Seco	PSGT3-2	Nov-09	0.00	0.0000
Palo Seco	PSGT2-2	Dec-09	0.00	0.0000
Palo Seco	PSGT3-1	Dec-09	0.00	0.0000
Palo Seco	PSGT3-2	Dec-09	0.00	0.0000
Palo Seco	PSGT2-2	Jan-10	0.00	0.0000
Palo Seco	PSGT3-1	Jan-10	0.00	0.0000
Palo Seco	PSGT3-2	Jan-10	0.00	0.0000
Palo Seco	PSGT2-2	Feb-10	701.90	0.0196
Palo Seco	PSGT3-1	Feb-10	1,131.12	0.0195

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data				
Plant	Unit ID	Month	Oil Consumption (bbls)	Sulfur (%)
Palo Seco	PSGT3-2	Feb-10	1,207.12	0.0194
Palo Seco	PSGT2-2	Mar-10	0.00	0.0000
Palo Seco	PSGT3-1	Mar-10	0.00	0.0000
Palo Seco	PSGT3-2	Mar-10	0.00	0.0000
Palo Seco	PSGT2-2	Apr-10	99.98	0.0200
Palo Seco	PSGT3-1	Apr-10	0.00	0.0000
Palo Seco	PSGT3-2	Apr-10	0.00	0.0000
Palo Seco	PSGT2-2	May-10	0.00	0.0000
Palo Seco	PSGT3-1	May-10	0.00	0.0000
Palo Seco	PSGT3-2	May-10	0.00	0.0000
Palo Seco	PSGT2-2	Jun-10	817.31	0.0243
Palo Seco	PSGT3-1	Jun-10	621.05	0.0243
Palo Seco	PSGT3-2	Jun-10	1,141.86	0.0243
Palo Seco	PSGT2-2	Jul-10	0.00	0.0000
Palo Seco	PSGT3-1	Jul-10	0.00	0.0000
Palo Seco	PSGT3-2	Jul-10	0.00	0.0000
Palo Seco	PSGT2-2	Aug-10	1,015.50	0.0238
Palo Seco	PSGT3-1	Aug-10	1,465.95	0.0238
Palo Seco	PSGT3-2	Aug-10	1,588.14	0.0238
Palo Seco	PSGT2-2	Sep-10	708.86	0.0200
Palo Seco	PSGT3-1	Sep-10	1,121.50	0.0192
Palo Seco	PSGT3-2	Sep-10	1,359.07	0.0192
Palo Seco	PSGT2-2	Oct-10	0.00	0.0000
Palo Seco	PSGT3-1	Oct-10	0.00	0.0000
Palo Seco	PSGT3-2	Oct-10	0.00	0.0000
Palo Seco	PSGT2-2	Nov-10	0.00	0.0000
Palo Seco	PSGT3-1	Nov-10	0.00	0.0000
Palo Seco	PSGT3-2	Nov-10	0.00	0.0000
Palo Seco	PSGT2-2	Dec-10	0.00	0.0000
Palo Seco	PSGT3-1	Dec-10	0.00	0.0000
Palo Seco	PSGT3-2	Dec-10	0.00	0.0000
Palo Seco	PSGT2-2	Jan-11	0.00	0.0000
Palo Seco	PSGT3-1	Jan-11	0.00	0.0000
Palo Seco	PSGT3-2	Jan-11	0.00	0.0000
Palo Seco	PSGT2-2	Feb-11	0.00	0.0000
Palo Seco	PSGT3-1	Feb-11	0.00	0.0000
Palo Seco	PSGT3-2	Feb-11	0.00	0.0000
Palo Seco	PSGT2-2	Mar-11	102.40	0.0200
Palo Seco	PSGT3-1	Mar-11	0.00	0.0000
Palo Seco	PSGT3-2	Mar-11	374.52	0.0200
Palo Seco	PSGT2-2	Apr-11	0.00	0.0000

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data				
Plant	Unit ID	Month	Oil Consumption (bbls)	Sulfur (%)
Palo Seco	PSGT3-1	Apr-11	0.00	0.0000
Palo Seco	PSGT3-2	Apr-11	0.00	0.0000
Palo Seco	PSGT2-2	May-11	0.00	0.0000
Palo Seco	PSGT3-1	May-11	0.00	0.0000
Palo Seco	PSGT3-2	May-11	0.00	0.0000
Palo Seco	PSGT2-2	Jun-11	0.00	0.0000
Palo Seco	PSGT3-1	Jun-11	0.00	0.0000
Palo Seco	PSGT3-2	Jun-11	0.00	0.0000
Palo Seco	PSGT2-2	Jul-11	0.00	0.0000
Palo Seco	PSGT3-1	Jul-11	0.00	0.0000
Palo Seco	PSGT3-2	Jul-11	0.00	0.0000
Palo Seco	PSGT2-2	Aug-11	1,160.21	0.0200
Palo Seco	PSGT3-1	Aug-11	773.93	0.0200
Palo Seco	PSGT3-2	Aug-11	865.08	0.0200
Palo Seco	PSGT2-2	Sep-11	382.74	0.0200
Palo Seco	PSGT3-1	Sep-11	425.27	0.0200
Palo Seco	PSGT3-2	Sep-11	340.21	0.0200
Palo Seco	PSGT2-2	Oct-11	1,152.31	0.0200
Palo Seco	PSGT3-1	Oct-11	1,218.74	0.0200
Palo Seco	PSGT3-2	Oct-11	1,161.00	0.0200
Palo Seco	PSGT2-2	Nov-11	0.00	0.0000
Palo Seco	PSGT3-1	Nov-11	0.00	0.0000
Palo Seco	PSGT3-2	Nov-11	0.00	0.0000
Palo Seco	PSGT2-2	Dec-11	0.00	0.0000
Palo Seco	PSGT3-1	Dec-11	0.00	0.0000
Palo Seco	PSGT3-2	Dec-11	0.00	0.0000
Palo Seco	PSGT2-2	Jan-12	0.00	0.0000
Palo Seco	PSGT3-1	Jan-12	0.00	0.0000
Palo Seco	PSGT3-2	Jan-12	0.00	0.0000
Palo Seco	PSGT2-2	Feb-12	3,578.46	0.0100
Palo Seco	PSGT3-1	Feb-12	3,177.34	0.0100
Palo Seco	PSGT3-2	Feb-12	3,215.35	0.0100
Palo Seco	PSGT2-2	Mar-12	0.00	0.0000
Palo Seco	PSGT3-1	Mar-12	0.00	0.0000
Palo Seco	PSGT3-2	Mar-12	0.00	0.0000
Palo Seco	PSGT2-2	Apr-12	0.00	0.0000
Palo Seco	PSGT3-1	Apr-12	0.00	0.0000
Palo Seco	PSGT3-2	Apr-12	0.00	0.0000
Palo Seco	PSGT2-2	May-12	0.00	0.0000
Palo Seco	PSGT3-1	May-12	0.00	0.0000
Palo Seco	PSGT3-2	May-12	0.00	0.0000

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data				
Plant	**Unit ID**	**Month**	**Oil Consumption (bbls)**	**Sulfur (%)**
Palo Seco	PSGT2-2	Jun-12	482.25	0.0200
Palo Seco	PSGT3-1	Jun-12	438.41	0.0200
Palo Seco	PSGT3-2	Jun-12	0.00	0.0000
Palo Seco	PSGT2-2	Jul-12	0.00	0.0000
Palo Seco	PSGT3-1	Jul-12	0.00	0.0000
Palo Seco	PSGT3-2	Jul-12	0.00	0.0000
Palo Seco	PSGT2-2	Aug-12	0.00	0.0000
Palo Seco	PSGT3-1	Aug-12	0.00	0.0000
Palo Seco	PSGT3-2	Aug-12	0.00	0.0000
Palo Seco	PSGT2-2	Sep-12	0.00	0.0000
Palo Seco	PSGT3-1	Sep-12	0.00	0.0100
Palo Seco	PSGT3-2	Sep-12	172.86	0.0000
Palo Seco	PSGT2-2	Oct-12	0.00	0.0000
Palo Seco	PSGT3-1	Oct-12	0.00	0.0000
Palo Seco	PSGT3-2	Oct-12	0.00	0.0000
Palo Seco	PSGT2-2	Nov-12	0.00	0.0000
Palo Seco	PSGT3-1	Nov-12	0.00	0.0000
Palo Seco	PSGT3-2	Nov-12	0.00	0.0000
Palo Seco	PSGT2-2	Dec-12	0.00	0.0000
Palo Seco	PSGT3-1	Dec-12	0.00	0.0000
Palo Seco	PSGT3-2	Dec-12	0.00	0.0000
Palo Seco	PSGT2-2	Jan-13	0.00	0.0000
Palo Seco	PSGT3-1	Jan-13	0.00	0.0000
Palo Seco	PSGT3-2	Jan-13	0.00	0.0000
Palo Seco	PSGT2-2	Feb-13	2,560.58	0.0194
Palo Seco	PSGT3-1	Feb-13	2,138.19	0.0194
Palo Seco	PSGT3-2	Feb-13	2,463.91	0.0196
Palo Seco	PSGT2-2	Mar-13	0.00	0.0000
Palo Seco	PSGT3-1	Mar-13	0.00	0.0000
Palo Seco	PSGT3-2	Mar-13	0.00	0.0000
Palo Seco	PSGT2-2	Apr-13	0.00	0.0000
Palo Seco	PSGT3-1	Apr-13	0.00	0.0000
Palo Seco	PSGT3-2	Apr-13	0.00	0.0000
Palo Seco	PSGT2-2	May-13	0.00	0.0000
Palo Seco	PSGT3-1	May-13	0.00	0.0000
Palo Seco	PSGT3-2	May-13	0.00	0.0000
Palo Seco	PSGT2-2	Jun-13	0.00	0.0000
Palo Seco	PSGT3-1	Jun-13	0.00	0.0000
Palo Seco	PSGT3-2	Jun-13	0.00	0.0000
Palo Seco	PSGT2-2	Jul-13	30.90	0.0200
Palo Seco	PSGT3-1	Jul-13	0.00	0.0000

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data				
Plant	Unit ID	Month	Oil Consumption (bbls)	Sulfur (%)
Palo Seco	PSGT3-2	Jul-13	108.31	0.0200
Palo Seco	PSGT2-2	Aug-13	0.00	0.0000
Palo Seco	PSGT3-1	Aug-13	0.00	0.0000
Palo Seco	PSGT3-2	Aug-13	0.00	0.0000
Palo Seco	PSGT2-2	Sep-13	629.07	0.0200
Palo Seco	PSGT3-1	Sep-13	557.14	0.0200
Palo Seco	PSGT3-2	Sep-13	271.52	0.0200
Palo Seco	PSGT2-2	Oct-13	0.00	0.0000
Palo Seco	PSGT3-1	Oct-13	0.00	0.0000
Palo Seco	PSGT3-2	Oct-13	0.00	0.0000
Palo Seco	PSGT2-2	Nov-13	0.00	0.0000
Palo Seco	PSGT3-1	Nov-13	0.00	0.0000
Palo Seco	PSGT3-2	Nov-13	0.00	0.0000
Palo Seco	PSGT2-2	Dec-13	0.00	0.0000
Palo Seco	PSGT3-1	Dec-13	0.00	0.0000
Palo Seco	PSGT3-2	Dec-13	0.00	0.0000
Palo Seco	PSGT2-2	Jan-14	0.00	0.0000
Palo Seco	PSGT3-1	Jan-14	0.00	0.0000
Palo Seco	PSGT3-2	Jan-14	0.00	0.0000
Palo Seco	PSGT2-2	Feb-14	0.00	0.0000
Palo Seco	PSGT3-1	Feb-14	0.00	0.0000
Palo Seco	PSGT3-2	Feb-14	0.00	0.0000
Palo Seco	PSGT2-2	Mar-14	146.35	0.0200
Palo Seco	PSGT3-1	Mar-14	162.75	0.0200
Palo Seco	PSGT3-2	Mar-14	236.00	0.0200
Palo Seco	PSGT2-2	Apr-14	803.14	0.0200
Palo Seco	PSGT3-1	Apr-14	566.37	0.0200
Palo Seco	PSGT3-2	Apr-14	293.02	0.0200
Palo Seco	PSGT2-2	May-14	3,473.26	0.0178
Palo Seco	PSGT3-1	May-14	3,581.14	0.0178
Palo Seco	PSGT3-2	May-14	3,158.57	0.0178
Palo Seco	PSGT2-2	Jun-14	1,971.02	0.0200
Palo Seco	PSGT3-1	Jun-14	2,568.86	0.0200
Palo Seco	PSGT3-2	Jun-14	2,572.64	0.0200
Palo Seco	PSGT2-2	Jul-14	6,390.57	0.0186
Palo Seco	PSGT3-1	Jul-14	5,156.93	0.0184
Palo Seco	PSGT3-2	Jul-14	5,163.71	0.0183
Palo Seco	PSGT2-2	Aug-14	20,128.97	0.0169
Palo Seco	PSGT3-1	Aug-14	18,422.47	0.0169
Palo Seco	PSGT3-2	Aug-14	14,063.94	0.0174
Palo Seco	PSGT2-2	Sep-14	5,877.76	0.0096

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data				
Plant	Unit ID	Month	Oil Consumption (bbls)	Sulfur (%)
Palo Seco	PSGT3-1	Sep-14	5,325.95	0.0096
Palo Seco	PSGT3-2	Sep-14	5,679.88	0.0096
Palo Seco	PSGT2-2	Oct-14	3,205.98	0.0095
Palo Seco	PSGT3-1	Oct-14	3,522.04	0.0095
Palo Seco	PSGT3-2	Oct-14	3,001.17	0.0095
Palo Seco	PSGT2-2	Nov-14	1,020.23	0.0103
Palo Seco	PSGT3-1	Nov-14	815.03	0.0106
Palo Seco	PSGT3-2	Nov-14	1,376.72	0.0106
Palo Seco	PSGT2-2	Dec-14	282.55	0.0100
Palo Seco	PSGT3-1	Dec-14	282.60	0.0100
Palo Seco	PSGT3-2	Dec-14	230.70	0.0100
Palo Seco	PSGT2-2	Jan-15	189.24	0.0100
Palo Seco	PSGT3-1	Jan-15	159.45	0.0100
Palo Seco	PSGT3-2	Jan-15	116.23	0.0100
Palo Seco	PSGT2-2	Feb-15	494.69	0.0100
Palo Seco	PSGT3-1	Feb-15	145.26	0.0100
Palo Seco	PSGT3-2	Feb-15	51.16	0.0100
Palo Seco	PSGT2-2	Mar-15	538.98	0.0100
Palo Seco	PSGT3-1	Mar-15	484.71	0.0100
Palo Seco	PSGT3-2	Mar-15	411.03	0.0100
Palo Seco	PSGT2-2	Apr-15	2082.95	0.0101
Palo Seco	PSGT3-1	Apr-15	1561.26	0.0101
Palo Seco	PSGT3-2	Apr-15	1639.11	0.0101
Palo Seco	PSGT2-2	May-15	671	0.0100
Palo Seco	PSGT3-1	May-15	605.52	0.0100
Palo Seco	PSGT3-2	May-15	0	0.0000
Palo Seco	PSGT2-2	Jun-15	3877.98	0.0108
Palo Seco	PSGT3-1	Jun-15	2735.98	0.0108
Palo Seco	PSGT3-2	Jun-15	2460.16	0.0109
Palo Seco	PSGT2-2	Jul-15	4718.4	0.0098
Palo Seco	PSGT3-1	Jul-15	2419.79	0.0098
Palo Seco	PSGT3-2	Jul-15	3550.4	0.0098
Palo Seco	PSGT2-2	Aug-15	2157.1	0.0100
Palo Seco	PSGT3-1	Aug-15	1888.31	0.0100
Palo Seco	PSGT3-2	Aug-15	1888.38	0.0100
Palo Seco	PSGT2-2	Sep-15	19798.69	0.0150
Palo Seco	PSGT3-1	Sep-15	17757.38	0.0150
Palo Seco	PSGT3-2	Sep-15	15215.43	0.0147
Palo Seco	PSGT2-2	Oct-15	16538	0.0221
Palo Seco	PSGT3-1	Oct-15	14279	0.0221
Palo Seco	PSGT3-2	Oct-15	872	0.0211

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data				
Plant	**Unit ID**	**Month**	**Oil Consumption (bbls)**	**Sulfur (%)**
Palo Seco	PSGT2-2	Nov-15	11058	0.0204
Palo Seco	PSGT3-1	Nov-15	10371	0.0204
Palo Seco	PSGT3-2	Nov-15	998	0.0204
Palo Seco	PSGT2-2	Dec-15	18659	0.0224
Palo Seco	PSGT3-1	Dec-15	17363	0.0224
Palo Seco	PSGT3-2	Dec-15	8333	0.0223
Palo Seco	PSGT2-2	Jan-16	5697	0.0209
Palo Seco	PSGT3-1	Jan-16	5392	0.0209
Palo Seco	PSGT3-2	Jan-16	3454	0.0209
Palo Seco	PSGT2-2	Feb-16	2306	0.0208
Palo Seco	PSGT3-1	Feb-16	2176	0.0208
Palo Seco	PSGT3-2	Feb-16	1794	0.0208
Palo Seco	PSGT2-2	Mar-16	7237	0.0201
Palo Seco	PSGT3-1	Mar-16	5384	0.0201
Palo Seco	PSGT3-2	Mar-16	5607	0.0201
Palo Seco	PSGT2-2	Apr-16	3452	0.0198
Palo Seco	PSGT3-1	Apr-16	3638	0.0197
Palo Seco	PSGT3-2	Apr-16	3494	0.0198
Palo Seco	PSGT2-2	May-16	6094	0.0194
Palo Seco	PSGT3-1	May-16	5962	0.0194
Palo Seco	PSGT3-2	May-16	5483	0.0194
Palo Seco	PSGT2-2	Jun-16	2116	0.0200
Palo Seco	PSGT3-1	Jun-16	1525	0.0200
Palo Seco	PSGT3-2	Jun-16	1797	0.0200
Palo Seco	PSGT2-2	Jul-16	16733	0.0302
Palo Seco	PSGT3-1	Jul-16	16375	0.0299
Palo Seco	PSGT3-2	Jul-16	13642	0.0302
Palo Seco	PSGT2-2	Aug-16	13538	0.0224
Palo Seco	PSGT3-1	Aug-16	13663	0.0221
Palo Seco	PSGT3-2	Aug-16	11844	0.0224
Palo Seco	PSGT2-2	Sep-16	7646	0.0214
Palo Seco	PSGT3-1	Sep-16	7885	0.0214
Palo Seco	PSGT3-2	Sep-16	1810	0.0212
Palo Seco	PSGT2-2	Oct-16	2509.67	0.0160
Palo Seco	PSGT3-1	Oct-16	2563.48	0.0160
Palo Seco	PSGT3-2	Oct-16	63.1	0.0160
Palo Seco	PSGT2-2	Nov-16	0	0.0000
Palo Seco	PSGT3-1	Nov-16	159.62	0.0160
Palo Seco	PSGT3-2	Nov-16	0	0.0000
Palo Seco	PSGT2-2	Dec-16	0	0.0000
Palo Seco	PSGT3-1	Dec-16	243.24	0.0160

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data				
Plant	Unit ID	Month	Oil Consumption (bbls)	Sulfur (%)
Palo Seco	PSGT3-2	Dec-16	0	0.0000
Palo Seco	PSGT2-2	Jan-17	1535.83	0.0160
Palo Seco	PSGT3-1	Jan-17	1536.21	0.0160
Palo Seco	PSGT3-2	Jan-17	0	0.0000
Palo Seco	PSGT2-2	Feb-17	2343.28	0.0156
Palo Seco	PSGT3-1	Feb-17	2224.12	0.0155
Palo Seco	PSGT3-2	Feb-17	0	0.0000
Palo Seco	PSGT2-2	Mar-17	804.78	0.0133
Palo Seco	PSGT3-1	Mar-17	895.64	0.0133
Palo Seco	PSGT3-2	Mar-17	0	0.0000
Palo Seco	PSGT2-2	Apr-17	3456.09	0.0133
Palo Seco	PSGT3-1	Apr-17	3230.55	0.0133
Palo Seco	PSGT3-2	Apr-17	0	0.0133
Palo Seco	PSGT2-2	May-17	6760.31	0.0102
Palo Seco	PSGT3-1	May-17	6066.52	0.0102
Palo Seco	PSGT3-2	May-17	0	0.0000
Palo Seco	PSGT2-2	Jun-17	8236.43	0.0060
Palo Seco	PSGT3-1	Jun-17	12480.3	0.0060
Palo Seco	PSGT3-2	Jun-17	0	0.0000
Palo Seco	PSGT2-2	Jul-17	14722.08	0.0042
Palo Seco	PSGT3-1	Jul-17	13099.23	0.0042
Palo Seco	PSGT3-2	Jul-17	0	0.0000
Palo Seco	PSGT2-2	Aug-17	30638.6	0.0066
Palo Seco	PSGT3-1	Aug-17	23686.57	0.0069
Palo Seco	PSGT3-2	Aug-17	0	0.0000
Palo Seco	PSGT2-2	Sep-17	11217.16	0.0255
Palo Seco	PSGT3-1	Sep-17	19769.71	0.0268
Palo Seco	PSGT3-2	Sep-17	0	0.0000
Palo Seco	PSGT2-2	Oct-17	29990.11	0.0339
Palo Seco	PSGT3-1	Oct-17	14154.29	0.0340
Palo Seco	PSGT3-2	Oct-17	0	0.0000
Palo Seco	PSGT2-2	Nov-17	31816.05	0.0451
Palo Seco	PSGT3-1	Nov-17	16565.71	0.0450
Palo Seco	PSGT3-2	Nov-17	0	0.0000
Palo Seco	PSGT2-2	Dec-17	24213.97	0.0352
Palo Seco	PSGT3-1	Dec-17	21228.84	0.0364
Palo Seco	PSGT3-2	Dec-17	0	0.0000
Palo Seco	PSGT2-2	Jan-18	19015.35	0.0320
Palo Seco	PSGT3-1	Jan-18	27917.61	0.0291
Palo Seco	PSGT3-2	Jan-18	0	0.0000
Palo Seco	PSGT2-2	Feb-18	14030.3	0.0188

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data				
Plant	Unit ID	Month	Oil Consumption (bbls)	Sulfur (%)
Palo Seco	PSGT3-1	Feb-18	27419.37	0.0190
Palo Seco	PSGT3-2	Feb-18	0	0.0000
Palo Seco	PSGT2-2	Mar-18	13186.57	0.0243
Palo Seco	PSGT3-1	Mar-18	11488.4	0.0244
Palo Seco	PSGT3-2	Mar-18	0	0.0000
Palo Seco	PSGT2-2	Apr-18	10972.54	0.0175
Palo Seco	PSGT3-1	Apr-18	7066.59	0.0177
Palo Seco	PSGT3-2	Apr-18	0	0.0000
Palo Seco	PSGT2-2	May-18	6064.97	0.0136
Palo Seco	PSGT3-1	May-18	145.32	0.0140
Palo Seco	PSGT3-2	May-18	0	0.0000
Palo Seco	PSGT2-2	Jun-18	472.68	0.0204
Palo Seco	PSGT3-1	Jun-18	1619.25	0.0223
Palo Seco	PSGT3-2	Jun-18	0	0.0000
Palo Seco	PSGT2-2	Jul-18	0	0.0000
Palo Seco	PSGT3-1	Jul-18	4691.69	0.0274
Palo Seco	PSGT3-2	Jul-18	0	0.0000
Palo Seco	PSGT2-2	Aug-18	0.6	0.0291
Palo Seco	PSGT3-1	Aug-18	8598.79	0.0286
Palo Seco	PSGT3-2	Aug-18	0	0.0000
Palo Seco	PSGT2-2	Sep-18	13.12	0.0283
Palo Seco	PSGT3-1	Sep-18	277.5	0.0283
Palo Seco	PSGT3-2	Sep-18	0	0.0000
Palo Seco	PSGT2-2	Oct-18	0	0.0000
Palo Seco	PSGT3-1	Oct-18	1224.14	0.0283
Palo Seco	PSGT3-2	Oct-18	0	0.0000
Palo Seco	PSGT2-2	Nov-18	0	0.0000
Palo Seco	PSGT3-1	Nov-18	5820.9	0.0239
Palo Seco	PSGT3-2	Nov-18	0	0.0000
Palo Seco	PSGT2-2	Dec-18	0	0.0000
Palo Seco	PSGT3-1	Dec-18	3408.06	0.0176
Palo Seco	PSGT3-2	Dec-18	0	0.0000
Palo Seco	PSGT2-2	Jan-19	0	0.0000
Palo Seco	PSGT3-1	Jan-19	0	0.0000
Palo Seco	PSGT3-2	Jan-19	0	0.0000
Palo Seco	PSGT2-2	Jan-19	0	0.0000
Palo Seco	PSGT3-1	Jan-19	0	0.0000
Palo Seco	PSGT3-2	Jan-19	0	0.0000
Palo Seco	PSGT2-2	Feb-19	0	0.0000
Palo Seco	PSGT3-1	Feb-19	78.21	0.0176
Palo Seco	PSGT3-2	Feb-19	0	0.0000

PREPA Palo Seco PSGT 2-2, 3-1, and 3-2 Monthly Baseline Operating Data				
Plant	**Unit ID**	**Month**	**Oil Consumption (bbls)**	**Sulfur (%)**
Palo Seco	PSGT2-2	Mar-19	0	0.0000
Palo Seco	PSGT3-1	Mar-19	767.43	0.0175
Palo Seco	PSGT3-2	Mar-19	0	0.0000
Palo Seco	PSGT2-2	Apr-19	0	0.0000
Palo Seco	PSGT3-1	Apr-19	1760.5	0.0170
Palo Seco	PSGT3-2	Apr-19	0	0.0000

FT8® GAS TURBINE MOBILEPAC® (Water Injected)
Estimated Performance and Emissions

Performance Data			
Fuel Type		Nat Gas	Liquid
Percent of Unit Rating	%	100	100
Ambient Temperature	Deg F	85.0	85.0
Ambient Pressure	psia	14.696	14.696
Burner Water Injection In-Service		Yes	Yes
Fuel HHV	Btu/lb	23,748	19,858
Gross Power Output per GT	MW	27.888	27.226
Gross Heat Rate, HHV	Btu/kW-hr	10,571	10,404
Fuel Flow, per GT	lbs/hr	12,414	14,264
Heat Input, HHV, per GT	MMBtu/hr	294.8	283.3
Emissions & Exhaust Conditions at Stack Exit			
NOx	ppmvd @ 15% O2	30	45
	lb/MMBtu	0.1100	0.1731
	lb/hr	32.4	49.0
	lb/MW-hr	1.16	1.80
CO	ppmvd @ 15% O2	34.2	14.5
	lb/MMBtu	0.0767	0.0343
	lb/hr	22.6	9.7
VOC	ppmvd @ 15% O2	4.0	5.3
	lb/MMBtu	0.0051	0.0071
	lb/hr	1.51	2.02
SO2 (5.0 gr/100 cf gas, 0.05% oil)	lb/hr	4.13	14.30
	lb/MMBtu	0.0140	0.0505
TSP/PM10/PM2.5, Filt and Cond	lb/hr	3.00	5.00
	lb/MMBtu	0.0102	0.0177

EAR Export Classification: ECCN EAR99

FT8® GAS TURBINE MOBILEPAC® (Estimated Only, Water Injected)
Estimated Performance and Emissions
PREPA - ARG

Configuration: Gas Fuel WI-31 ppmvd NOx @ 15% O2, 0 m Alt., 70% RH, 60Hz PT, 60 Hz, 13.8 kV, 0.9 pf, Simple-Cycle

Performance Data																
Fuel Type		Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas
Percent of Unit Rating	%	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Number of GT's in Operation	No.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ambient Relative Humidity	%	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Ambient Temperature	Deg F	-40.0	-18.4	-10.0	4.0	10.0	30.0	43.0	48.0	50.0	59.0	70.0	80.0	85.0	90.0	100.0
Ambient Pressure	Psia	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696
Plenum Inlet Temperature	Deg F	-40.0	-18.4	-10.0	4.0	10.0	30.0	43.0	48.0	50.0	59.0	70.0	80.0	85.0	90.0	100.0
Burner Water Injection In-Service	Yes / No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inlet Loss	Inch H2O	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Exhaust Loss	Inch H2O	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fuel LHV	Btu/lb	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414
Ratio of HHV to LHV		1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109
Gross Power Output per MP, ref Gen Term	MWe	29.919	30.619	30.875	31.252	31.247	31.268	31.283	31.217	31.081	30.288	29.358	28.373	27.888	27.218	26.149
Gross Heat Rate, LHV, ref Gen Term	Btu/kWhr	8,864	8,956	8,995	9,064	9,092	9,191	9,256	9,279	9,285	9,325	9,404	9,487	9,532	9,603	9,732
Power Isle and BOP Aux Load, per MP	kW	327	327	327	327	327	327	327	327	327	327	327	327	327	327	327
Net Power Output, per MP	MWe	29.592	30.292	30.548	30.925	30.920	30.941	30.956	30.890	30.754	29.961	29.031	28.046	27.561	26.891	25.822
Net Heat Rate, LHV	Btu/kWhr	8,962	9,052	9,091	9,159	9,188	9,288	9,354	9,378	9,384	9,427	9,509	9,598	9,703	9,720	9,855
Fuel Flow, per GT	lbs/hr	12,385	12,805	12,969	13,227	13,267	13,420	13,522	13,527	13,477	13,189	12,892	12,570	12,414	12,206	11,884
Gaseous Fuel Flow, per GT	SCF/hr	283,945	293,592	297,333	303,269	304,180	307,688	310,014	310,143	308,987	302,396	295,580	288,199	284,612	279,859	272,457
Calc Heat Input, HHV, per GT	MMBtu/hr	294	304	308	314	315	319	321	321	320	313	306	299	295	290	282
Burner Water Injection Flow, per GT	gal/min	20.1	22.2	23.0	24.3	24.7	26.0	26.9	27.1	27.0	26.4	26.0	25.4	25.1	24.8	24.2
Emissions & Exhaust Conditions at Stack Exit, After Addition of Secondary (Enclosure) Cooling Air *																
NOx	ppmvd	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
NOx, as NO2, per GT	lbs/hr	32	33	34	34	34	35	35	35	35	34	33	33	32	31	31
CO	ppmvd	77.3	70.5	62.9	47.9	43.6	41.3	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
CO, per GT	lbs/hr	54.3	51.2	46.3	36.0	32.8	31.5	24.7	24.7	24.6	24.0	23.5	22.9	22.6	22.1	21.5
VOC as C1	ppmvd	8.2	6.9	5.9	4.0	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
VOC as C1, per GT	lbs/hr	3.28	2.87	2.47	1.74	1.55	1.52	1.54	1.54	1.53	1.50	1.46	1.42	1.41	1.38	1.34
SO2	ppmvd	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
SO2, per GT	lbs/hr	0.81	0.84	0.85	0.87	0.87	0.88	0.89	0.89	0.88	0.86	0.84	0.82	0.81	0.80	0.78
TSP/PM10, Filterable and Cond, per MP	lbs/hr	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Exhaust Gas Mass Flow, per GT **	lbs/sec	293.4	285.1	282.0	277.0	274.7	267.2	262.6	260.7	259.8	255.7	249.5	243.8	240.7	237.8	230.6
Exhaust Gas Temperature **	Deg F	561	615	636	671	683	725	752	760	762	768	780	790	794	799	810
Exhaust Gas Molecular Weight, Wet		28.54	28.50	28.48	28.45	28.44	28.38	28.34	28.32	28.31	28.28	28.22	28.16	28.11	28.07	27.94
Exhaust Gas Vol Flow Rate, per GT **	ACFS	7,659	7,846	7,919	8,035	8,058	8,142	8,196	8,202	8,186	8,107	8,003	7,896	7,840	7,787	7,653
Stack Exhaust Exit Velocity **	ft/sec	153.8	157.6	159.0	161.3	161.8	163.5	164.6	164.7	164.4	162.8	160.7	158.6	157.4	156.4	153.7
H2O **	% Vol wet	5.60	6.08	6.28	6.64	6.77	7.33	7.80	8.00	8.05	8.32	8.85	9.47	9.87	10.27	11.42
O2 **	% Vol wet	16.11	15.78	15.65	15.43	15.36	15.08	14.88	14.81	14.80	14.78	14.67	14.57	14.49	14.45	14.21
CO2 **	% Vol wet	2.11	2.24	2.29	2.37	2.40	2.49	2.55	2.56	2.56	2.54	2.54	2.53	2.53	2.51	2.51
A **	% Vol wet	0.90	0.89	0.89	0.89	0.89	0.88	0.88	0.88	0.88	0.87	0.87	0.86	0.86	0.86	0.84
N2 **	% Vol wet	75.28	75.00	74.88	74.66	74.58	74.21	73.89	73.75	73.70	73.48	73.06	72.56	72.25	71.90	71.01

* All concentrations corrected to 15% O2

** Secondary (Enclosure) Cooling Air Mixed with Primary Exhaust

All data subject to sum of Notes on Sheet - 1

All data are estimates.

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EAR Export Classification: ECCN EAR99

FT8® GAS TURBINE MOBILEPAC® (Estimated Only, Water Injected)
Estimated Performance and Emissions
PREPA - ARG

Configuration: Liquid Fuel WI-42 ppmvd NOx @ 15% O2, 0 m Alt., 70% RH, 60Hz PT, 60 Hz, 13.8 kV, 0.9 pf, Simple-Cycle

Performance Data																	
Fuel Type		Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
Percent of Unit Rating	%	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Number of GT's in Operation	No.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ambient Relative Humidity	%	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Ambient Temperature	Deg F	-40.0	-18.4	-10.0	4.0	10.0	30.0	43.0	50.0	59.0	70.0	77.0	80.0	85.0	90.0	100.0	110.0
Ambient Pressure	Psia	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696
Plenum Inlet Temperature	Deg F	-40.0	-18.4	-10.0	4.0	10.0	30.0	43.0	50.0	59.0	70.0	77.0	80.0	85.0	90.0	100.0	110.0
Burner Water Injection In-Service	Yes / No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inlet Loss	Inch H2O	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Exhaust Loss	Inch H2O	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fuel LHV	Btu/lb	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646
Ratio of HHV to LHV		1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065
Gross Power Output per MP, ref Gen Term	MWe	27.486	28.114	28.113	28.126	28.122	28.164	28.172	28.179	28.198	28.196	28.207	27.911	27.226	26.647	25.577	24.479
Gross Heat Rate, LHV, ref Gen Term	Btu/kWhr	9,030	9,119	9,161	9,233	9,265	9,376	9,453	9,495	9,549	9,619	9,665	9,696	9,769	9,834	9,965	10,111
Power Isle and BOP Aux Load, per MP	kW	352	352	352	352	352	352	352	352	352	352	352	352	352	352	352	352
Net Power Output, per MP	MWe	27.134	27.762	27.761	27.774	27.770	27.812	27.820	27.827	27.846	27.844	27.855	27.559	26.874	26.295	25.225	24.127
Net Heat Rate, LHV	Btu/kWhr	9,147	9,235	9,277	9,350	9,382	9,495	9,572	9,615	9,670	9,741	9,787	9,819	9,956	9,966	10,104	10,259
Fuel Flow, per GT	lbs/hr	13,311	13,749	13,812	13,927	13,973	14,162	14,282	14,349	14,441	14,546	14,621	14,513	14,264	14,054	13,669	13,275
Liquid Fuel Flow, per GT	gal/min	31	32	32	33	33	33	34	34	34	34	34	34	34	33	32	31
Calc Heat Input, HHV, per GT	MMBtu/hr	264	273	274	277	277	281	284	285	287	289	290	288	283	279	271	264
Burner Water Injection Flow, per GT	gal/min	23.9	26.4	27.1	28.3	28.8	30.5	31.6	32.1	32.9	33.8	34.4	34.2	33.7	33.2	32.4	31.5
Emissions & Exhaust Conditions at Stack Exit, After Addition of Secondary (Enclosure) Cooling Air *																	
NOx	ppmvd	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
NOx, as NO2, per GT	lbs/hr	46	47	48	48	48	49	49	49	50	50	50	50	49	48	47	45
CO	ppmvd	46.8	35.8	32.9	28.2	26.7	22.0	19.0	17.8	16.3	14.8	13.9	13.8	13.7	13.6	13.3	13.2
CO, per GT	lbs/hr	31.0	24.5	22.7	19.6	18.6	15.5	13.5	12.7	11.8	10.7	10.1	10.0	9.7	9.5	9.0	8.7
VOC as C1	ppmvd	12.4	6.8	5.6	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
VOC as C1, per GT	lbs/hr	4.71	2.68	2.20	1.98	1.99	2.02	2.03	2.04	2.06	2.07	2.08	2.06	2.02	1.99	1.94	1.88
SO2	ppmvd	9.08	9.07	9.06	9.06	9.06	9.07	9.08	9.07	9.07	9.07	9.07	9.08	9.16	9.12	9.12	9.14
SO2, per GT	lbs/hr	12.51	12.92	12.98	13.09	13.13	13.31	13.43	13.49	13.57	13.67	13.74	13.64	13.41	13.21	12.85	12.48
TSP/PM10, Filterable and Cond, per MP	lbs/hr	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Exhaust Gas Mass Flow, per GT **	lbs/sec	289.9	281.7	278.0	272.2	269.8	262.1	257.4	254.9	251.8	248.0	245.7	243.8	239.9	236.4	229.8	223.1
Exhaust Gas Temperature **	Deg F	534	586	603	633	645	688	715	730	749	771	786	789	794	799	810	819
Exhaust Gas Molecular Weight, Wet		28.79	28.77	28.75	28.73	28.72	28.68	28.64	28.61	28.56	28.50	28.44	28.42	28.38	28.32	28.20	28.04
Exhaust Gas Vol Flow Rate, per GT **	ACFS	7,308	7,475	7,505	7,557	7,577	7,657	7,709	7,737	7,776	7,822	7,854	7,821	7,739	7,673	7,552	7,428
Stack Exhaust Exit Velocity **	ft/sec	146.7	150.1	150.7	151.8	152.2	153.8	154.8	155.4	156.2	157.1	157.7	157.1	155.4	154.1	151.7	149.2
H2O **	% Vol wet	4.17	4.59	4.74	5.00	5.13	5.67	6.13	6.43	6.89	7.59	8.13	8.35	8.70	9.17	10.30	11.74
O2 **	% Vol wet	16.54	16.23	16.13	15.96	15.89	15.62	15.42	15.30	15.13	14.89	14.72	14.69	14.66	14.55	14.33	14.07
CO2 **	% Vol wet	2.69	2.86	2.91	2.99	3.03	3.15	3.23	3.27	3.33	3.39	3.44	3.43	3.41	3.41	3.40	3.38
A **	% Vol wet	0.90	0.90	0.90	0.89	0.89	0.89	0.88	0.88	0.88	0.87	0.87	0.86	0.86	0.86	0.85	0.83
N2 **	% Vol wet	75.70	75.42	75.33	75.14	75.06	74.67	74.34	74.11	73.77	73.25	72.83	72.67	72.36	72.00	71.12	69.98

* All concentrations corrected to 15% O2

** Secondary (Enclosure) Cooling Air Mixed with Primary Exhaust

All data subject to sum of Notes on Sheet - 1

All data are estimates.

PrfCustCopy_PREPA-ARG_FT8-MP-WI_60Hz_138_AD_R0_10042019.xlsx

FT8® GAS TURBINE MOBILEPAC® (Estimated Only, Water Injected)
Notes Applicable to Performance and Emissions Data
PREPA - ARG

PrfCustCopy_PREPA-ARG_FT8-MP-WI_60Hz_138_AD_R0_10042019.xlsx

WARNING -- This document contains technical data the export of which is or may be restricted by the Export Administration Act and the Export Administration Regulations (EAR), 15 C.F.R. parts 730-774. Diversion contrary to U.S. law is prohibited. The export, reexport, transfer or re-transfer of this technical data to any other company, entity, person, or destination, or for any use or purpose other than that for which the technical data was originally provided by PW Power Systems (PWPS), is prohibited without prior written approval from PWPS and authorization under applicable export control laws.
EAR Export Classification: ECCN EAR99

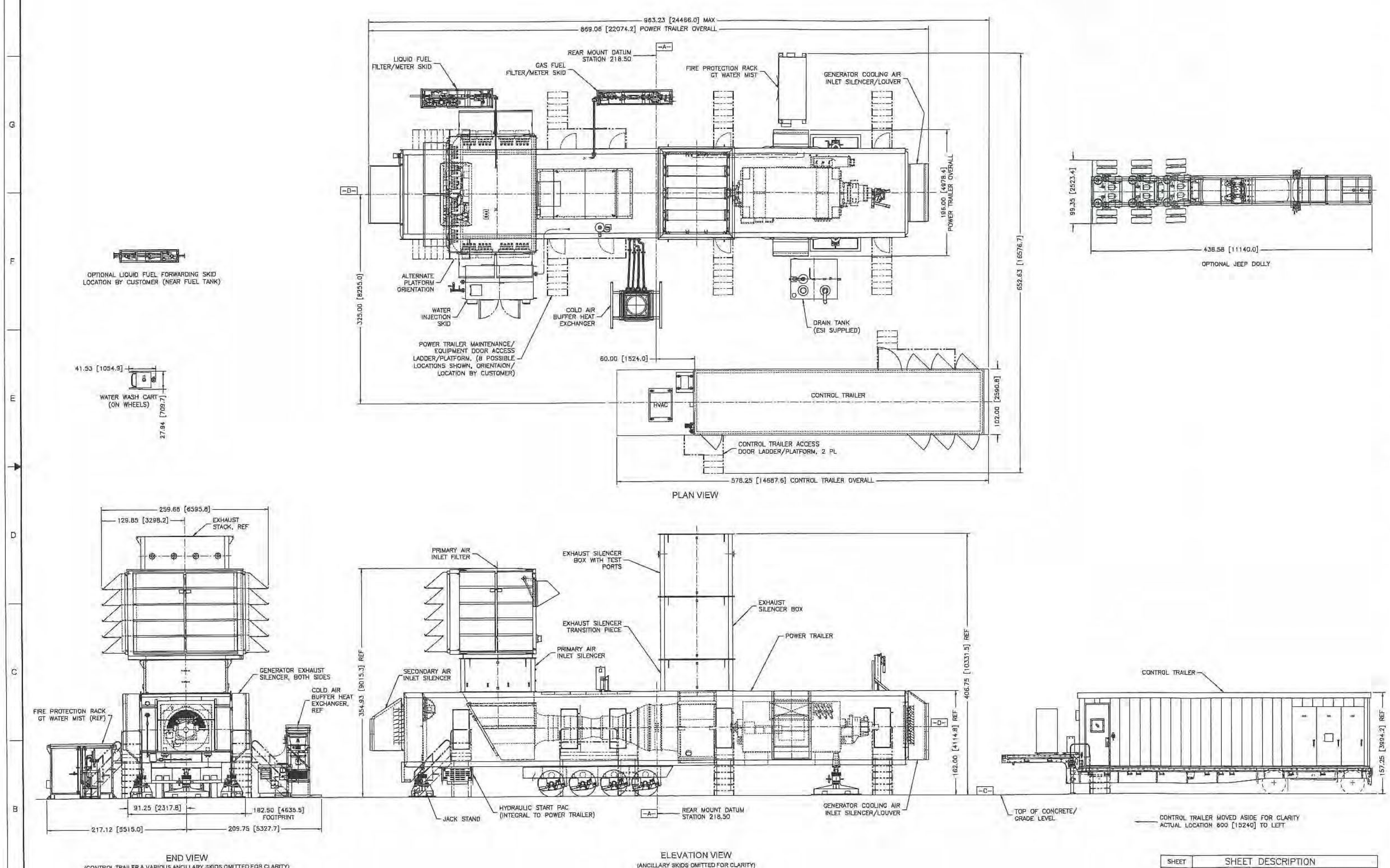
Notes:

1. All Performance/Emissions Data submitted are subject to the sum of the following notes, and the most recent version of PWPS "Factory and Field Tests" at the time of the proposal offering.
   All data is presented on an estimated basis.
2. The MOBILEPAC® (MP) consists of one turbine (1-GT) driving one generator. Rates are shown as per GT, and per MOBILEPAC® (MP), which are equivalent for this configuration.
3. Gaseous fuel supplied to gas turbines must meet PWPS fuel specification FR-2, liquid fuel supplied to gas turbines must meet PWPS fuel specification FR-1. Water used for burner injection must meet PWPS specification AR-1 (demin water).
4. Water injected performance requires water injection to the stated NOx concentrations, at 15% O2 on a dry basis.
   DRY performance data is based on the standard combustor without water injection.
5. All data supplied based on 0m/0ft Alt. and 70% relative humidity.
6. Inlet loss estimated at 63.5mm/2.5in W.C. with 2-stage inlet filter. No correction of test results for inlet loss.
7. Exhaust loss for all cases estimated at 25.4mm/1in W.C. for standard exhaust stack. There will be no correction of test results for exhaust loss in simple-cycle.
8. Stack exhaust velocity is based on exhaust gas vol flow rate and exhaust exit area (4.63sq m/49.8sq ft).
9. Secondary (enclosure) cooling air is mixed with primary exhaust flow, before stack exit.
10. Data designated as "primary exhaust" is referenced to the GT exhaust and does not include secondary (enclosure) cooling air.
11. All data submitted is based upon a generator operating at 60Hz, 0.9 power factor @ 13.8kV.
12. Net Power = Power measured at the generator terminals, minus auxiliary load for power island and 200 kW BOP.
13. GSU losses and gas compression loads are not included in Net Power output or Net Heat Rate determinations.
14. Performance Acceptance Test for GT Net Power Output and GT Net Heat Rates to be conducted per PWPS test procedures, instrumentation, and calculations; all being in general accordance with ASME PTC-22 (2005) and PTC-19.1.
15. Performance acceptance testing for GT Net Power Output and GT Net Heat Rate shall be furnished by PWPS through third party contractor.
16. Test boundary shall be Ambient Temperature as defined by the average dry bulb temperature at the inlet filter face.
17. Site performance to be corrected for changes in ambient temperature, pressure, relative/specific humidity and power factor.
18. Thermal performance tests must be conducted in "New & Clean" condition, with less than 100 fired-hours. If Units are dispatched for Commercial Operation, or operated by Purchaser for more than 100 fired-hours, then thermal performance will have been deemed to have been met, and any thermal performance testing would be conducted and reported as "Information Only".
19. Approximately 30 days prior to performance testing of the units, Purchaser will be provided with correction curves for the GT power and heat rate, as well as draft performance acceptance test procedures. Curves and procedures will not be issued with RFQ responses.
20. Emission data is representative of steady-state operation, and may not be indicative of emissions during transient operation. Demonstration of emission concentrations for NOx, CO and VOC's are based on 1-hour averages, after operation under steady-state conditions for 1-hour. "Steady state" shall be defined as less than +/-1.3% variation from the average for power output, which is in alignment for the PTC-22 (2005) gas turbine code for steady state conditions. Compliance with shall be based on the average of stack traverse's.
21. Applications that utilize CEM systems, must use a multi-point, multiple probe system to read emissions concentrations in the backpass. This averaging system is required to prevent emission compliance issues related to diluent stratification associated with the addition of secondary (enclosure) cooling air, and the use of noise attenuation baffles in the stack.
22. Performance and emissions are based upon assumed fuel compositions shown on Sheet - 2, and significant changes from these assumed characteristics can change the quoted performance and emissions.
23. SO2 data is estimated from Sulfur contents stated on Sheet - 2, which PWPS does not control and therefore can't guarantee.
24. All emission measurements to be by US EPA methods. All emissions measurements for engine tuning, demonstration of emissions levels and/or Air Permit compliance (and related procedures), to be furnished by Purchaser, and shall conform to PWPS Quality Assurance procedure: "McHale PWPS EmissionsTuningQAProcedure 0001ETQAR3.pdf"
25. Volatile Organic Compounds (VOC) are defined as non methane, non ethane, with > 85% of the composition being ethene. Values shown are based upon PWPS experience and measurement using EPA Method 25A (total UHC) on liquid fuel, and/or Method 18 (w/Tedlar bag samples) if UHC exceeds VOC levels on gaseous fuel.
26. Testing for PM10 shall conform to PWPS Quality Assurance documentation in addition to EPA Reference Method 5 (filterable) and R/M 202 (condensable/back half) fractions. Volumetric flow rate for determination of PM10 to be per EPA Method 19, which utilized fuel flow, O2%, and F-factors.
27. Particulate samples shall be drawn isokinetically, with a minimum of 3-hour sample duration and are to consist of 3-tests. sample results are outside of specification, any suspect PM10 test shall be rejected and retested at the expense of the customer.
28. In the event that the customer does not provide emissions measurements for tuning of water injection systems which meet the requirements of the PWPS Emissions Quality Assurance document, then PWPS reserves the right to tune water/fuel ratios in accordance with our default levels.
29. In the event that the customer does not conduct emissions testing for the verification of compliance with PWPS emissions levels, or if such testing is not in accordance with PWPS Emissions Quality Assurance document, the achievement of substantial completion of the project by PWPS shall not be delayed.
30. If future emissions tuning or testing are required after the initial commissioning period when staffed by PWPS personnel and/or contractors, the additional mobilizations/demobilizations and provision of technical teams for the tuning and/or testing shall be at the customers expense.
31. Tested NOx concentrations shall be corrected lower for liquid fuel bound nitrogen (FBN) in excess of 0.015% by weight.

1410-100-S000D | SH 2 | REV -

REVISION HISTORY

EC NO.	REV	ZONE	DESCRIPTION	REVISED BY / DATE	APPROVED BY / DATE
38421	-		INITIAL RELEASE	CDH 09Jan19	RDT 11JAN19



SHEET	SHEET DESCRIPTION
2	GENERAL ARRANGEMENT – SIDE-BY-SIDE CONFIGURATION

PROJECT: 1410	PW Power Systems
REFERENCE: 1428-100-S000D-02-revA	TITLE: GENERAL ARRANGEMENT MOBILE PAC
DRAWN: A.LSP 08Jan19	SIZE: E; CAGE CODE: ; DWG NO.: 1410-100-S000D; REV: -
CHECKED: RDT 11JAN19	SCALE: 1:50; WT: ; SHEET 2 OF
DESIGN: RDT 11JAN19	
DRAWING STATUS: RELEASED	

DWG NO. 1410-100-S000D

1410-100-S000D-02.dwg 14/Feb/19 14:01 p00082do

Appendix C:

Copy of Approved Environmental Evaluations (Rule 141)

18 de junio de 2019

RE: Solicitud de Determinación ambiental bajo exclusión categórica.

Luego del paso del Huracán María y la susceptibilidad del Sistema Eléctrico de PR, la AEE ha identificado la necesidad de fortalecer la generación eléctrica en el Área Norte del País, a su vez contemplo el uso de Unidades Generatrices de mayor eficiencia a las existentes y con la opción de mover estás de acuerdo a las necesidades del sistema en términos de operación, mantenimiento y en emergencias.

Por este medio la PREPA (Palo Seco) solicita una determinación de cumplimiento ambiental bajo exclusión categórica. Se identifica la actividad de excavación no profundas (trincheras) y la instalación de sistemas de alta eficiencia energética. Exclusiones número 21 y 26.

El Proyecto consiste en la compra e instalación de tres Unidades Móviles Generatrices de 30 MW cada una. El Proyecto requiere la conexión de esas al Sistema Eléctrico de la AEE (Central Palo Seco) y la instalación al Sistema de combustible de los tanques de la AEE. No habrá excavaciones profundas, construcción permanente, otras. Las estructuras ya vienen construidas en tráiler, y se ensamblan o unen en el sitio.

Exclusiones Categóricas solicitadas para la actividad.

B. Modificar usos existentes o acciones aprobadas

21. Relocalización o reemplazo de líneas eléctricas aéreas y soterradas en áreas previamente impactadas o urbanizadas. Incluye la instalación de tuberías, trincheras, registros y postes con un máximo de ciento cinco pulgadas (105") de profundidad para

excavación de trincheras, y de doce pies (12') máximos de profundidad para fosas de postes.

26. Acciones para conservar energia tales como la instalación y reemplazo de equipos o sistemas de alta eficiencia energética para mejorar la eficiencia en el control de la calidad ambiental en una instalación existente.

GOBIERNO DE PUERTO RICO
Departamento de Recursos Naturales y Ambientales

NOV 0 4 2019

Sr. Victor V. De Castro Carlo
Autoridad de Energía Eléctrica
PO Box 364267
San Juan, PR 00936

141-19-0538
Generadores de Electricidad para Emergencias
"Palo Seco Power Plant", PR-870
Toa Baja, Puerto Rico

Estimado señor De Castro:

El Departamento de Recursos Naturales y Ambientales (DRNA) ha recibido la documentación sometida para la instalación y operación de tres (3) generadores de electricidad para emergencias en la facilidad de referencia.

Los tres generadores (1, 2 y 3) son idénticos: marca Caterpillar modelo LC6 con capacidad generación nominal de 400 kW, motor marca Caterpillar, modelo C-13, con capacidad o potencia de 609 HP, operación máxima de 500 horas/año, y razón de consumo de combustible diésel de 28.4 gal/hr. La chimenea (tubo de escape): muflers de 10" de diámetro y altura de 8'-0".

Las tres unidades poseen tanques de combustible diésel de acero doble pared, integrados a los generadores, y con capacidad de 1041 galones cada uno.

La Secretaria Auxiliar de Cumplimiento Ambiental del DRNA (anterior Junta de Calidad Ambiental), amparado en la Regla 141 del Reglamento Núm. 8858 del 23 de noviembre de 2016, conocido como el "Reglamento Para el Proceso de Evaluación Ambiental" ha determinado que la acción propuesta no ocasionará impactos significativos al ambiente. El documento sometido para la acción propuesta cumple con lo requerido en el Artículo 4-B (3) de la Ley sobre Política Pública Ambiental, Ley 416-2004, según enmendada.

No obstante, se le requiere que cumpla con todas las disposiciones de las leyes y reglamentos estatales y federales aplicables, incluyendo las siguientes:

1. Solicitar a través de la Oficina de Gerencia de Permisos (OGPe) los correspondientes permisos conforme al Reglamento Núm. 7308 del 1 de marzo de 2007, conocido como el "Reglamento para el Trámite de Permisos Generales".

NOV 04 2019

2. Controlar los olores objetables que puedan afectar la atmósfera comunal.

3. Cumplir con el Reglamento Núm. 8019 del 9 de mayo de 2011, conocido como el "Reglamento para el Control de la Contaminación por Ruido" en lo relacionado al nivel de sonido máximo permitido.

4. Revisar el Plan de Emergencia de la facilidad de referencia de manera que este incluya los tanques sobre tierra para suplir combustible diésel a los generadores, y todos los tanques sobre tierra que se utilicen para almacenar combustible diésel o sustancias químicas; y presentar el mismo ante el Área de Calidad de Agua, reflejando las acciones a tomar para evitar, controlar y remediar derrames de diésel o cualquier otra sustancia química, a tenor con la Regla 1306.5 del Reglamento Núm. 9079 del 26 de abril de 2019, conocido como el "Reglamento de Estándares de Calidad de Agua de Puerto Rico".

Las recomendaciones presentadas en esta comunicación, no eximen de cumplir con cualquier otro requerimiento o permiso del DRNA o de cualquier otra agencia estatal o federal, que sean aplicables a la acción propuesta.

Cordialmente,

pm

Tania Vázquez Rivera
Secretaria

ADL/adl

Certificación de Cumplimiento Ambiental por Exclusión Categórica

Puerto Rico Electric Power Authority (PREPA) Palo Seco

Fecha de Expedición:

26/JUN/2019

Datos de Localización

De conformidad con las disposiciones contenidas en las leyes y los reglamentos vigentes, se expide la presente Certificación de Exclusión Categórica para la acción(es) antes descrita(s):

Dirección Física:

Dirección: PALO SECO POWER PLANT
PR-870,
PUERTO RICO, 00949
Municipio: Toa Baja
Estado: Puerto Rico
Código Postal: 00949

Dueño:

Autoridad Energia Electrica

Sometido por:

Autoridad Energia Electrica

Calificación

Distrito(s) de Calificación: I-P (50%), CR (49%), DT-G (1%)

Distrito en el Mapa de Inundabilidad: X (57.5%), 0.2 PCT (33.2%), AE (9.1%), VE (0.2%)
Tipo de Suelo: Ud (82.6%), Hy (13.3%), W (4.0%), Sm (0.1%)

Número(s) de Catastro:

039-000-008-04

Datos de determinación

Exclusión Categórica

Números de exclusión categórica aplicables de acuerdo a la R-11-17 de la JCA*:

21,26

Fecha de Expedición:

26/JUN/2019

Condiciones Generales

De acuerdo con la solicitud de esta Determinación, se certificó cumplimiento con los siguientes requisitos, cuyo incumplimiento podrá repercutir en la revocación de esta Determinación:

1. Las actividades de uso o de construcciones livianas de nuevas estructuras no están ubicadas o desarrolladas en:

a. Areas especiales de riesgo de inundaciones, derrumbes o marejadas.

b. Areas en las que la Junta de Calidad Ambiental (JCA) u otras agencias gubernamentales estatales o federales hayan determinado que existe un grado de contaminación que excede el permitido por los reglamentos vigentes.

c. Areas ecológicamente sensitivas o protegidas, según establecido por el Departamento de Recursos Naturales y Ambientales (DRNA), en las que existan especies únicas de fauna o flora o que estén en peligro de extinción o en las que puedan afectarse ecológicamente sistemas naturales o artificiales, ya sea en forma directa o indirecta.

d. Areas en las que existan problemas de infraestructura o de deficiencias en los sistemas de servicios de suministro de agua potable, disposición de las aguas sanitarias, suministro de energía eléctrica o capacidad vial para el manejo adecuado del tránsito de vehículos de motor.

e. Areas que constituyan yacimientos minerales, conocidos o potenciales.

f. Areas en las que existen yacimientos arqueológicos o de valor cultural, según determinado por el Instituto

PO Box 41179 San Juan, Puerto Rico 00940-1179 • 787-721-8282

Certificación de Cumplimiento Ambiental por Exclusión Categórica

de Cultura Puertorriqueña (ICP).

g. Areas de topografía escarpada, en cuencas hidrográficas donde se puedan afectar fuentes de abasto de agua potable.

h. Cualquier otra acción que la JCA haya establecido mediante Resolución.

2. No descargarán contaminantes a cuerpos de agua, ni generará desperdicios peligrosos o emisiones al aire que excedan dos (2) toneladas al año de contaminantes de aire criterio, o cinco (5) toneladas de cualquier combinación de contaminantes criterios, ni emitirá al aire contaminantes peligrosos o tóxicos u olores objetables.

3. La disposición o descarga de las aguas usadas se realizará mediante acometidas a un sistema sanitario existente, lo cual requerirá la obtención del endoso de la AAA previo a la solicitud de permisos de construcción.

4. Que existe la infraestructura necesaria (agua potable y alcantarillado sanitario suministrado por la AAA, energía eléctrica, alcantarillado pluvial, vías de acceso) para servir a la operación del proyecto o actividad propuesta, con excepción de los proyectos agrícolas que se ubican por regla general en las áreas rurales, así como las residencias unifamiliares asociadas en las que las instalaciones de esa naturaleza son limitadas.

5. La operación de la actividad no afectará áreas residenciales o zonas de tranquilidad por contaminación sónica según establecido por el Reglamento para el Control de la Contaminación por Ruido.

6. Que el desarrollo de la instalación comercial, industrial, de servicio, institucional y de desarrollo de terrenos para uso turístico y proyectos recreativos no excede de cinco mil (5,000) pies cuadrados de conStrucción en área total de ocupación y área bruta de piso y que cumple con las condiciones de ubicación y operación establecidas por la OGPe u otra agencia con jurisdicción, según sean aplicables.

7. El uso de edificios o estructuras existentes para facilidades comerciales, almacenes y usos industriales o de servicios no excederán de cien mil (100,000) pies cuadrados en área total de ocupación y área bruta de piso. Dicha operación deberá cumplir con las condiciones de ubicación y operación establecidas por la OGPe u otra agencia con jurisdicción, según sean aplicables, y las establecidas para las exclusiones categóricas en este Reglamento.

8. Para la ejecución o desarrollo de las acciones aprobadas como exclusiones categóricas, se requerirá la obtención de los permisos aplicables de las agencias gubernamentales para las etapas de construcción y operación.

9. La acción no ha sido fragmentada o segmentada para fines de la evaluación y será determinación de la agencia proponente si la misma satisface o no los requisitos para ser considerada y ejecutada bajo una exclusión categórica.

10. Que ha cumplido con el requisito de publicación de un Aviso Público de conformidad con la Regla 122 del Reglamento de Evaluación y Trámite de Documentos Ambientales de la JCA, en el caso que la acción propuesta esté relacionada al uso u otorgamiento de fondos federales que requieran un proceso de evaluación parecido al de NEPA (NEPA-Like Process).

Aviso

Si luego de haberse aquí dado cumplimiento con el Artículo 4(B) de la Ley Núm. 416 surgieran variaciones sustanciales en la acción propuesta que requieran la evaluación a los impactos ambientales, habrá que presentar el correspondiente documento ambiental, de conformidad con la Ley sobre Política Pública Ambiental.

Condiciones Especiales

NINGUNA

Firma / Sellos

PO Box 41179 San Juan, Puerto Rico 00940-1179 • 787-721-8282

Certificación de Cumplimiento Ambiental por Exclusión Categórica

Fecha de Expedición:
26/JUN/2019

Arq. María R. Cintrón Flores
Secretaria Auxiliar
Departamento de Desarrollo Económico y Comercio de Puerto Rico
Oficina de Gerencia de Permisos

Arq. María R. Cintrón Flores
Secretaria Auxiliar de la OGPe, DDEC

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Appendix D:

DNER Emergency Waiver for the Installation of (3) Combustion Turbines at Palo Seco

GOBIERNO DE PUERTO RICO
DEPARTAMENTO DE RECURSOS NATURALES Y AMBIENTALES

24 OCT. 2019

ING. JOSÉ ORTIZ
Director Ejecutivo
Autoridad de Energía Eléctrica de Puerto Rico
Apartado 364267
San Juan, PR 00936-4267

Att: Efran Paredes Maisonet
Director Planificación y Protección Ambiental

Estimado ingeniero Ortiz,

Re: Solicitud de Dispensa de Emergencia
Autoridad de Energía Eléctrica de Puerto Rico.
Central Palo Seco
TV-4911-70-1196-0015

En carta con fecha del 11 de octubre de 2019 el Sr. Efran Paredes Maisonet, Director Planificación y Protección Ambiental de la Autoridad de Energía Eléctrica de Puerto Rico (en adelante AEE) presentó una solicitud de dispensa de emergencia para la instalación y operación de tres turbinas de gas con una capacidad de generación de aproximadamente 23 MW. La solicitud se presenta para asegurar la confiabilidad y resiliencia del sistema eléctrico. Esta solicitud se presenta conforme las disposiciones de la Regla 302 del Reglamento para el Control de la Contaminación Atmosférica (RCCA), Reglamento Núm. 5300, según enmendado. El inciso A de la Regla 302 del RCCA establece que:

A) La Junta podrá conceder dispensas de emergencia solo bajo circunstancias muy especiales, como por ejemplo, para evitar una amenaza inminente a la salud.
...

Según establece la AEE en su solicitud de dispensa, actualmente tiene varias unidades de carga base que están fuera de servicios debido a mantenimientos o reparaciones, o están limitadas a parte de su capacidad de generación de electricidad. Esta situación afecta la resiliencia del sistema eléctrico del país. Razón por la cual presentaron la solicitud de dispensa.

Conforme a lo anterior, se aprueba la solicitud de dispensa por un periodo que no podrá exceder de 90 días a partir de la fecha de esta notificación. Durante el periodo de dispensa deberá cumplir con todas las condiciones incluidas en el anejo. La información y condiciones sometidas en su solicitud de permiso forman parte de esta autorización.

24 OCT. 2019

De conformidad con la Sección 5.4 de la Ley Núm. 38-2017, conocida como, Ley de Procedimiento Administrativo Uniforme del Gobierno de Puerto Rico, se le apercibe que: "Toda persona a la que la agencia deniegue la concesión de una licencia, franquicia, permiso, endoso, autorización o gestión similar, tendrá derecho a impugnar la determinación de la agencia por medio de un procedimiento adjudicativo, según se establezca en la ley especial de que se trate y en el Capítulo III de dicha Ley." Para esto, se concede un término de veinte (20) días a partir de la notificación del mismo.

La agencia podrá revocar esta autorización en cualquier momento si se violan las condiciones del mismo o reglamentos y/o regulaciones aplicables. La agencia, además, podrá emitir una Orden de Cese y Desistimiento y Mostrar Causa.

Cualquier duda o pregunta, puede comunicarse con el Ing. Luis Sierra, Gerente Interino del Área de Calidad de Aire, al 787-767-8181, extensión 2300, o a través del correo electrónico luissierra@jca.pr.gov.

Cordialmente,

Tania Vázquez Rivera
Secretaria

TVR/lst

24 OCT. 2019

ANEJO: CONDICIONES DE DISPENSA

1. Por este medio se autoriza una dispensa por emergencia la instalación y operación de tres turbinas de gas en la Central Palo Seco, con una capacidad de generación de aproximadamente 23 MW cada una. Esta dispensa tendrá una duración que no excederá de 90 días a partir de la aprobación de la misma.
2. Deberá mantener copia de esta dispensa en la instalación en todo momento. La misma estará disponible para inspección por el personal técnico del Departamento de Recursos Naturales y Ambientales (en adelante DRNA) o la Agencia Federal de Protección Ambiental (EPA, en inglés).
3. Una vez culmine la dispensa, las unidades deberán ser desconectadas, a menos que un permiso para la construcción para las unidades, según las disposiciones de la Regla 203 del Reglamento 5300, según enmendado, haya sido emitido por esta agencia.
4. Esta dispensa no exime de acciones de cumplimiento y/o legales por la construcción/instalación de las unidades previo a la otorgación de esta dispensa de emergencia.
5. Para la operación de los generadores, el contenido máximo de azufre en el combustible No. 2 no excederá de 0.5 porciento por peso y en el gas natural no excederá de 5 gr/100 sft^3.
6. Deberá tener un registro de operación y consumo de combustible con contenido de azufre y horas de operación para cada turbina.
7. Deberá enviar un informe de aplicabilidad, y/o notificación inicial de ser necesario, con respecto a las disposiciones del 40 CFR, Parte 60, Subparte GG, Subparte KKKK o cualquier otra regulación que sea aplicable a las turbinas. Deberán indicar en el informe todos los requisitos aplicables a la unidad de emisión. De existir regulaciones que sean potencialmente aplicables, deberá indicar en el informe las razones por las cuales no le aplica.
8. Deberá cumplir con todos los requisitos aplicables en el informe enviado a la agencia. El no identificar adecuadamente la regulación aplicable, no les exime de incumplimiento con la regulación federal y/o estatal.
9. Estas unidades fueron clasificadas en su solicitud de dispensa como unidades estacionarias de emisión. Deberá llevar a cabo las pruebas de funcionamiento requeridas por la regulación federal para fuentes estacionarias, en los términos establecidos en el estándar de emisión aplicable.
10. Deberá someter un informe mensual indicando en una base diaria el contenido de azufre (porciento por peso) en los combustibles quemados o consumidos en la unidad durante cada mes. Este informe será enviado a la Junta a la atención de la Jefa de la División de Validación de Datos Modelaje Matemático del Área de Calidad de Aire, la Sra. Lula Lucia Fernández Fontán. Todos los informes mensuales deberán ser enviados en o antes de los treinta (30) días siguientes al final de cada mes natural.
11. La tonalidad de los gases emitidos durante la operación de cada motor incluido en este permiso no excederá del 20% de opacidad. Se permitirá una tonalidad de hasta 60% de opacidad sólo en un periodo no mayor de 4 minutos dentro de cualquier periodo de 30 minutos consecutivos.

TM

CN 078-
04479
Rev.

GOBIERNO DE PUERTO RICO

Autoridad de Energía Eléctrica de Puerto Rico

11 de octubre de 2019

Ing. Luis R. Sierra Torres
Gerente Área de Calidad de Aire
Junta de Calidad Ambiental
PO Box 11488
San Juan, Puerto Rico 00910

Estimado ingeniero Sierra Torres:

Dispensa Emergencia para Instalación de Turbinas de Gas en la Central Palo Seco para Proporcionar Energía de Respaldo de Emergencia

La Autoridad de Energía Eléctrica (Autoridad) interesa instalar tres turbinas de gas de aproximadamente 23 MW cada una en la Central Palo Seco. Estas turbinas estarán disponibles para proveer generación de emergencia (*backup*) como parte del plan de contingencia que desarrolló la Autoridad durante la temporada de huracanes y que, a su vez, nos permitirá asegurar el mantenimiento de un servicio de energía eléctrica confiable en la Isla y que servirá para reforzar la resistencia del sistema de la Autoridad, que se requiere en este momento. Dado que nos encontramos en la temporada de huracanes, la Autoridad pretende comenzar la instalación y condicionamiento de estas tres unidades inmediatamente. Por consiguiente, la Autoridad solicita que se otorgue una dispensa conforme lo dispone la Regla 302 del Reglamento para el Control de la Contaminación Atmosférica de la Junta de Calidad Ambiental, vigente. De esta manera estas unidades estarán disponibles para su uso desde octubre de 2019.

Necesidad inmediata de energía para asegurar confiabilidad y resiliencia del sistema eléctrico

Actualmente, la Autoridad tiene varias unidades de carga base que están fuera de servicio por mantenimiento o reparación, o se limitan a solo una parte de su capacidad. Como ejemplo de lo anterior podemos mencionar; que la Unidad 2 de Aguirre se encuentra fuera de servicio (probablemente hasta febrero del 2020) debido a una falla del transformador principal de la unidad. En la Central San Juan, la Unidad 10 está fuera de servicio desde el 2016, la unidad de Ciclo Combinado San Juan 5 saldrá de servicio para la conversión a quema dual de combustible y la Unidad 6 tiene limitaciones de carga por alta presión del condensador.

En Palo Seco la Unidad 2 se encuentra fuera de servicio, y las Unidades 3 y 4 tienen limitada su capacidad.

Al mismo tiempo, otras unidades base deben someterse a mantenimientos o salidas ambientales obligatorias. Otras unidades están limitadas en cuanto a sus operaciones porque son unidades de uso limitado bajo el *Mercury and Air Toxic Standard* (MATS, por sus siglas en inglés) aprobado por la Agencia Federal de Protección Ambiental (EPA, por sus siglas en ingles). De otra parte, en San Juan la unidad 6 tiene salida programada en noviembre de 2019, la Unidad 8 estará fuera de servicio hasta comienzos de noviembre, además de ser una unidad de uso limitado por MATS. La Unidad 1 de Palo Seco se someterá a su salida ambiental y estará fuera de servicio hasta comienzos de noviembre, además de ser una unidad de uso limitado bajo la regulación MATS. En Costa Sur la unidad 6 tiene una salida programada desde finales de octubre hasta principio de diciembre. Por lo que, la falta de unidades podría resultar en una incapacidad para proveer la demanda de energía necesaria, lo que podría ocasionar interrupciones del servicio.

Por las razones antes expuestas y ante la necesidad de poder satisfacer de manera confiable la demanda eléctrica y como parte del plan de contingencia que establecimos para cubrir incidencias que puedan ocurrir, la Autoridad propone instalar estas tres turbinas de gas en Palo Seco. La disponibilidad de estas tres nuevas turbinas de gas ayudará a restaurar la energía de forma rápida en caso de emergencia y a asegurar la estabilidad y la resiliencia del sistema de la Autoridad. Estas nuevas turbinas se ubicarán estratégicamente en Palo Seco, en el área metropolitana de San Juan, donde la demanda de energía eléctrica es mayor. Además, el lugar se encuentra preparado ya que se ubicarán las mismas en el área donde se instalaron los generadores de emergencia que proveyó el Cuerpo de Ingenieros luego de los huracanes Irma y María, los cuales proporcionaron la estabilidad que requería el sistema de electricidad en ese momento. La destrucción por los huracanes Irma y María de las líneas de transmisión más importantes de la Autoridad creó restricciones de transmisión grave que retrasó la capacidad de la Autoridad para restaurar completamente la energía en la Isla.

Descripción de la Central Palo Seco

La Central Palo Seco se encuentra en 56.3 hectáreas en una zona industrial en la carretera PR-165 km 30.8 en el municipio de Toa Baja. Palo Seco consiste de diez unidades generadoras existentes distribuidas en dos áreas de la central: la termoeléctrica que consiste en cuatro calderas de vapor con una capacidad de generación combinada de 602 MW y la porción del bloque de alimentación de la planta (*powerblock*) que consiste en seis turbinas de gas con una capacidad de generación combinada de 126 MW. Cada turbina de gas existente es de 21 MW cada una. También en Palo Seco se encuentran tres generadores de electricidad de emergencia y una bomba de contra incendio con motor diésel. Palo Seco es una fuente mayor bajo un permiso Título V. Palo Seco no tiene un permiso de prevención del deterioro significativo ("PSD" por sus siglas en ingles).

Descripción de las Turbinas de Gas a ser instaladas en Palo Seco

La Autoridad propone instalar tres paquetes de turbinas de gas MOBILEPAC® con motores FT8® con una capacidad de aproximadamente 23 MW cada una. El MOBILEPAC® ofrece 22.5 MW (Diésel) / 23.8 MW (Gas Natural) de energía. Utilizando la probada tecnología de turbina de gas SWIFTPAC®, este paquete está diseñado para proporcionar energía rápida, confiable y es especialmente útil en situaciones de emergencia. Cada MOBILEPAC® comprende de dos vagones de arrastre. El primero contiene la turbina de gas, generador eléctrico, motor, colector de escape y difusor de sistema de aceite lubricación. El segundo vagón lleva el sistema de control, panel de operación, relés de protección, baterías y cargador, centro control de motores y el paquete de arranque hidráulico.

Se estima que la instalación de estas unidades no conlleva un aumento significativo en la capacidad de generación de la Central. Estas nuevas unidades tienen la capacidad de usar diésel o gas natural como combustible (*dual fuel*). La instalación de estas unidades tiene el potencial de facilitar un cambio en el perfil del combustible de la Autoridad a gas natural de una combustión más limpia. Sin embargo, en estos momentos se utilizará diésel de bajo contenido de azufre. Para la operación del equipo propuesto, se utilizarán los tanques existentes en la planta para almacenar combustible y que están provistos de un dique para control de derrames de combustible.

Las turbinas de gas ya se encuentran en las facilidades de la Central Palo Seco y se instalarán en la parte sur de la Central, al sureste de donde está situado el *powerblock* actual. Para asegurar la disponibilidad durante la temporada de huracanes, la Autoridad interesa completar la instalación durante el mes de octubre de 2019. No se prevén mayores trabajos de construcción que no sean aquellos requeridos para la estabilización de las bases de los equipos, las debidas conexiones eléctricas y a los tanques de combustible.

La Autoridad identificó los fondos necesarios para la instalación de un sistema de inyección de agua desmineralizada para el control de emisiones de las turbinas. Actualmente, estamos en un proceso competitivo para seleccionar al contratista que completará dicha instalación, se espera que en las próximas dos semanas se concrete la selección. El sistema debe estar en servicio antes de 4 meses.

Durante el proceso de instalación y condicionamiento parcial de las turbinas se requiere la operación de las mismas. Como parte de su instalación y condicionamiento se realizarán pruebas para verificar el encendido de la turbina, condiciones del generador y sus protecciones eléctricas, ajustes de control y pruebas de sincronización eléctrica entre otros. El consumo de combustible No.2 (.05 % azufre por peso) para las pruebas será de aproximadamente 135,000 galones.

La puesta en marcha de las unidades se espera que sea entre mediados o cerca de finales de octubre de 2019. Las operaciones continuas de las unidades deben comenzar durante las primeras semanas de noviembre de 2019.

En la Tabla 1 y 2, a continuación, la Autoridad proporciona los factores de emisiones esperados para las turbinas de gas y el estimado de emisiones durante la operación de las unidades en el período cubierto por la dispensa. Información de respaldo se incluye en los Apéndices A, B, C y D que acompañan esta solicitud:

Tabla 1: Factores de Emisión para las Turbinas PW FT8 Mobilepac:

PALO SECO TURBINAS FT-8 MOBILEPAC [1]					
OPERACION EN DIESEL - DRY			OPERACION EN GAS NATURAL - DRY		
CONTAMINANTE	FACTOR DE EMISION	UNIDADES	CONTAMINANTE	FACTOR DE EMISION	UNIDADES
PM	0.0773	Lbs/MMBtu	PM	0.0233	Lbs/MMBtu
PM10	0.0773	Lbs/MMBtu	PM10	0.0233	Lbs/MMBtu
PM2.5	0.0773	Lbs/MMBtu	PM2.5	0.0233	Lbs/MMBtu
SOx	0.0554	Lbs/MMBtu	SOx (Mass Bal.)	0.0152	Lbs/MMBtu
NOx	2.2060	Lbs/MMBtu	NOx	0.8373	Lbs/MMBtu
VOC	0.0072	Lbs/MMBtu	VOC	0.0013	Lbs/MMBtu
CO	0.0352	Lbs/MMBtu	CO	0.0210	Lbs/MMBtu
HEAT INPUT	233	MMBtu/Hr	HEAT INPUT	252	MMBtu/Hr

[1] NOTES:

1) PW FT8 Emissions (lb/MMBtu) are based upon PW FT8 performance data at 85°F
2) PW FT8 Allowable (MMBtu/yr) based upon allowable emissions (tpy) and emission rates (lb/MMBtu) for each pollutant
3) Natural Gas Sulfur Content 5.0 gr/100 dscf
4) Fuel Oil Sulfur Content .05 % per wt
5) SO2 emissions based upon fuel sulfur content limits
6) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
7) Heating Value Fuel Oil .138 MMBtu/Gal
8) Heating Value Natural Gas .00102 MMBtu/SCF
9) NOx PSD Limiting Pollutant

Tabla 2: Estimado de Emisiones - Turbinas PW FT8 Mobilepac, período de dispensa:

PALO SECO TURBINAS FT-8 MOBILEPAC (3 UNIDADES) - DRY - BAJO LIMITE SIGNIFICATIVO DE PSD[1]			
CONTAMINANTE	PW FT8 EMISIONES PERMISIBLES (tons) PSD	PW FT8 COMBUSTIBLE PERMISIBLE - GAS (SCF)	PW FT8 COMBUSTIBLE PERMISIBLE - DIESEL (GAL)
NOx	**39**	**91,329,802**	**256,217**
PM	24	2,016,806,723	4,502,415
PM10	14	1,176,470,588	2,626,409
PM2.5	9	756,302,521	1,688,406
SO2	39	5,044,656,606	10,201,057
VOC	39	56,678,200,692	78,390,269
CO	99	9,229,744,728	40,768,823

Aunque la necesidad inmediata de las tres turbinas de gas es servir como fuente de energía durante la temporada de huracanes, o absorber cualquier tipo de incidencia que se pueda registrar ante la falta de capacidad de generación por la que atravesamos, eventualmente la Autoridad interesa mantener estas unidades para sus operaciones regulares. Para ello considera comenzar con el proceso de los trámites correspondientes para licenciar las mismas y de esta forma proceder con el reemplazo de tres de las unidades existentes de 21 MW GE 5000 en la Central Palo Seco, toda vez que resultan más eficientes. La Autoridad espera que el gas natural esté disponible en la Central Palo Seco en un futuro cercano.

La Autoridad no puede precisar cuándo exactamente las tres unidades existentes puedan ser retiradas, pero se espera que esto ocurra después de la actual temporada de huracanes. La razón de esto es que la Autoridad tiene que mantener cierta redundancia en sus activos de generación durante la temporada de huracanes para promover la resiliencia y para garantizar la suficiente energía en el caso de otro desastre. Como señalamos anteriormente, esto es especialmente cierto para la generación de unidades ubicadas en la parte norte de la Isla, que se encuentran cerca de la demanda y no son tan vulnerables a las posibles restricciones de transmisión que pueden resultar de las condiciones del tiempo.

Conclusión

Dada la necesidad de mayor resiliencia frente a la actual temporada de huracanes, y tomando en consideración la necesidad de absorber la demanda de energía que se requiere la Autoridad solicita que basado en las disposiciones de la Regla 302 del RCCA se nos permita la instalación de las tres turbinas de gas en octubre de 2019 en la Central

Palo Seco. Esto le permite a la Autoridad tener estas unidades disponibles para su uso a principios de noviembre de 2019. De igual forma le permite determinar los pasos a seguir para que estas unidades puedan utilizarse a mayor capacidad para reemplazar unidades existentes.

De necesitar información adicional, puede comunicarse con la señora Luisette X. Ríos, Jefa de la División Protección Ambiental y Confiabilidad de Calidad, por el (787) 521-4960.

Cordialmente,

Efran Paredes Maisonet, Director
Planificación y Protección Ambiental

LXRC/MVM/JAS/yba

GOBIERNO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

PUERTO RICO VERDE

Área de Calidad de Aire

SOLICITUD DE PERMISO PARA LA CONSTRUCCIÓN U OPERACIÓN DE FUENTES DE EMISIÓN EN PUERTO RICO

PARTE II - PROCESO DE LA PLANTA Y DESCRIPCIÓN DE EMISIONES

I. EMISIONES INDUSTRIALES: (Movimiento de terreno, almacenaje en tanques, talleres de pintado, etc.)

1. Descripción del proceso u operación que emite contaminantes atmosféricos:
N/A

2. Materia prima usada o procesada: ______ (Tipo) ______ (Cantidad) ______ (unidad/unidad tiempo)

3. Equipo de control para emisiones:

Tipo	Eficiencia % por peso

4. Chimeneas:

Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
pies	pulg.	°F	pies/seg.
pies	pulg.	°F	pies/seg.

5. Volumen de descarga de emisiones: ______ Pies^3/min.
6. Emisiones actuales: Estimado basado en: ______.

Tipo de contaminante	Cantidad (masa/tiempo)	Duración (tiempo/unidad tiempo)

7. Incluya un diagrama de flujo del proceso (tipo bloque) demostrando puntos, cantidades y tipos de emisiones.

II. EMISIONES POR COMBUSTIÓN: (Calderas, calentadores, plantas de emergencia, bombas de incendio, etc.)

1. Equipo de combustión: 3 Turbinas de Combustión PWPS FT-8 Mobilepac (DRY): 252 MMBtu/Hr per Unit Nat.Gas: 233 MMBtu/Hr per Unit Fuel Oil ó ______
Tipo / BTU/hr / HP

2. Combustible:

Tipo	Gal/hr ó	Lb/hr	% azufre
Diesel	1,680		.05
Gas Natural	242,932 Scf/Hr		5.0 gr/100 dscf

3. Equipo de control para emisiones: / 4. Chimeneas:

Tipo	Eficiencia % por peso	Altura	Diámetro Salida	Temp. Salida	Velocidad Salida
N/A Diesel		33.89 pies	120.95" x 97.08" pulg.	793 °F	142.8 pies/seg.
N/A Gas Natural		33.89 pies	120.95" x 97.08" pulg.	790 °F	146.6 pies/seg.

III. EMISIONES POR INCINERACIÓN O DISPOCISIÓN DE DESPERDICIOS: (Sólidos, líquidos, gaseosos)

1. Método para disponer los desperdicios: N/A.
2. Tipo de desperdicios: ______ Cantidad: ______ Lb/día.
3. Incinerador: ______ (Tipo) ______ (Marca) ______ (Capacidad (Lb/día)).
4. Chimenea: ______ Pies (Altura) ______ Pies (Diámetro Salida) ______ °F (Temp. Salida) ______ Pies/seg. (Velocidad Salida)
5. Combustible auxiliar: Tipo ______ Gal/hr ó Lb/hr ______ % azufre ______
6. Equipo de control: ______ (Tipo) ______ % por peso. (Eficiencia)

IV. CUMPLIMIENTO: Incluya datos o información demostrando que las emisiones no exceden los límites establecidos.
V. EQUIPO DE CONTROL: Incluya esquema de la instalación del equipo de control de la fuente de emisión.

CERTIFICACIÓN DE UN INGENIERO, QUÍMICO O ARQUITECTO LICENCIADO

Certifico que estoy registrado y autorizado para practicar mi profesión en Puerto Rico; que el equipo y medidas para el control de emisiones son adecuadas y cumplen con las disposiciones del Reglamento de Control de Contaminantes Atmosféricos de la Junta de Calidad Ambiental de Puerto Rico y que, de acuerdo a mis mejores conocimientos y creencias, la información suministrada es veraz, completa y exacta.

17776-PE	Ing. Efran Paredes Maisonet	
Número de Licencia	Nombre (Letra de molde)	Firma

EFRAN PAREDES MAISONET INGENIERO LICENCIADO LIC. #17776 PUERTO RICO

Fecha: ______. Número de solicitud: ______

Dirección Física: Edificio de Agencias Ambientales Cruz A. Matos, San José Industrial Park, 1375 Avenida Ponce de León, San Juan, Puerto Rico 00926-2604
Dirección Postal: Apartado 11488, San Juan, PR 00910
Tel. (787) 767-8181 • Fax (787) 756-5906

GOBIERNO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

PUERTO RICO VERDE

Área de Calidad de Aire

HOJA DE PAGO

Número de Solicitud: ____________
Nombre del Oficial Responsable: Ing. Daniel Hernández
Título: Director de Generación
Nombre del Proyecto o Fuente de Emisión: Turbinas Palo Seco FT8 Mobilepac
Dirección Postal: ____________

I. Pago por Solicitud de Permiso:
1. Pago por Radicación ($100.00): (X) Construcción ( ) Operación
( ) Escuela de Adiestramiento de Asbesto $100.00
2. (X) Pago por Permiso 3. ( ) Pago por Renovación 4. ( ) Pago por Modificación
($25.00 por toneladas por Contaminante - Dispensa)

CONTAMINANTE	EMISIONES (Ton/año)	CARGO TOTAL
Material Particulado (PM, PM_{10}, $PM_{2.5}$)	50	$1,250
Dióxido de Azufre (SO_x)	40	$1,000
Oxido de Nitrógeno (NO_x)	40	$1,000
Compuestos Orgánicos Volátiles (VOC) e Hidrocarburos (HC)	40	$1,000
Plomo (Pb)		
Otros (Favor de identificar) CO	100	$2,500
TOTAL		$6,850

CERTIFICACIONES DE ASBESTO

1. Escuela de Adiestramiento de Asbesto $600.00		N/A
2. Registro de Asbesto ($40.00 por categoría) ( ) Especialista en Muestreo de Aire ( ) Diseñador de proyecto ( ) Planificador de proyecto ( ) Inspector ( ) Supervisor ( ) Trabajador		

OTROS CARGOS

1. Cambio de dueño o localización (50% del cargo por radicación) N/A
2. Pago por Revisión (50% del cargo por radicación) N/A
3. Duplicados de Permisos $10.00 N/A
4. Pago por Exceso de Emisiones:
   A. Dispensas ($25.00/ton/contaminante) $6,750
   B. Pequeños Negocios ($12.50/ton/cantaminante) N/A

PAGO TOTAL DE LA SOLICITUD:

II. Pago anual (pago por un año) N/A
III. Pago por cuatro (4) años extras (pago por 4 años) N/A
IV. TOTAL (cheque # 470934) $6,850

PARA COMPLETARSE EN LA OFICINA DEL ÁREA DE CALIDAD DE AIRE

Cantidad a pagar: ____________ Fecha: ____________ Recibido por: ____________

Número de cheque: ____________ Número de recibo: ____________

Firma del Representante autorizado JCA

Firma División de Finanzas

Dirección Física: Edificio de Agencias Ambientales Cruz A. Matos, San José Industrial Park,
1375 Avenida Ponce de León, San Juan, Puerto Rico 00926-2604
Dirección Postal: Apartado 11488, San Juan, PR 00910
Tel. (787) 767-8181 • Fax (787) 756-5906

Puerto Rico Electric Power Authority
CITIBANK, N.A. -CSMG
GENERAL FUND

CHECK NO. **470934**
DATE 25-SEP-19

PAY Six Thousand Eight Hundred Fifty And NO/100 Dollars ***********$6,850.00

TO THE ORDER OF

SECRETARIO DE HACIENDA
JUNTA DE CALIDAD AMBIENTAL
PO BOX 11488
SAN JUAN, PR 00910-1488

José A. Torres
Dale Sánchez Serrano

NOT VALID AFTER THREE MONTHS FROM DATE OF ISSUE

⑈00470934⑈ ⑆021502040⑆ 04000150 15⑈

Puerto Rico Electric Power Authority

CITIBANK CSMG - GENERAL FUND

Vendor Number	Date	Check No.
00498715	25-SEP-19	470934

Date	Invoice	Description	Gross	Withheld Amount	Discount	Net
24-JUN-19	19-06-SR-118	DISPENSA PALO SECO MEGA GENERADORES	6,850.00	0.00	0.00	6,850.00
THE ATTACHED CHECK IS IN PAYMENT FOR ITEMS DESCRIBED ABOVE		**TOTAL**	6,850.00	0.00	0.00	6,850.00

RENOVACIÓN APROBADA: 16 de noviembre, 2015

RENEWAL APPROVED ON: November 16, 2015

NÚM. EMP. 11964

Estado Libre Asociado de Puerto Rico
Commonwealth of Puerto Rico

DEPARTAMENTO DE ESTADO
Department of State

Secretaría Auxiliar de Juntas Examinadoras
Office of the Assistant Secretary of State for Examining Boards

La Junta Examinadora de Ingenieros y Agrimensores
The Examining Board of Engineers and Land Surveyors

por la presente certifica que
hereby certifies that

Efran Paredes Maisonet

habiendo cumplido todos los requisitos de Ley, se ha inscrito en el Registro de esta Junta como
having met all the requirements of law, has been registered as:

Ingeniero Licenciado
Licensed Engineer

En testimonio de lo cual, se expide esta licencia para el ejercicio de dicha profesión, bajo el sello de la Junta Examinadora.
In testimony whereof, this license is issued to practice this profession, under the seal of the Board of Examiners.

En San Juan, Puerto Rico, efectivo 15 de diciembre de 2015
In San Juan, Puerto Rico, effective December 15, 2015.

16 FEB 16 AM 9:08

Número de Licencia: 17776
License Number

Vencimiento: 15 de diciembre de 2020
Expires: December 15, 2020

JUNTA EXAMINADORA DE INGENIEROS Y AGRIMENSORES
ESTADO LIBRE ASOCIADO DE PUERTO RICO
DEPARTAMENTO DE ESTADO

Presidente

Secretario Auxiliar Lcdo. Francisco Rodríguez Bernier
Under Secretary

Certifico que es copia fiel y exacta del original.

Sonia Miranda Vega, Directora
Planificación y Protección Ambiental
Núm. Emp. 9218, Tel. 4884

COPY

#empleado 11964

OGC ARCHIVOS DE PERSONAL

Y CORREOS-NOV15'18 AM11:06

CERTIFICO QUE ESTE DOCUMENTO ES
COPIA FIEL Y EXACTA DEL ORIGINAL.

Mónica ... 14/nov/2018

FIRMA FECHA


G
EFRAN
PAREDES MAISONET
11964

APENDICE B

ESPECIFICACIONES DEL MANUFACTURERO (PWPS/ARG)

PERFORMANCE CURVES & EMISSION RATES

Following find FT8 Guaranteed Performance for this proposal. Performance tables and curves are shown for dry and water injection burning with diesel or natural gas

Guaranteed net unit output (diesel) @ specified conditions without water or steam injection	MW 22.563
Guaranteed net unit output (NG) @ specified conditions without water or steam injection	MW 23.842
Unit minimum load for continuous operation	MW 1
Time from shutdown to guaranteed net unit output	**Minutes 10**
Unit Heat Rate (NG – LHV) Assume 21,414 BTU/Lb energy content @ guar net unit output	BTU/KW-hr 9574
Unit Heat Rate (diesel – LHV) Assume 18,646 BTU/Lb energy content @ guar net unit output	BTU/KW-hr 9759

(1) If energy price varies with output, provide data related to this variation. Provide output vs. Energy Price curves if applicable.

FT8® GAS TURBINE MOBILEPAC®
Notes Applicable to Performance and Emissions Data
PREPA - ARG

Prf_CustCpy_PREPA-ARG_FT8-MP_60Hz_138_AS_R0_091418.xlsm

WARNING -- This document contains technical data the export of which is or may be restricted by the Export Administration Act and the Export Administration Regulations (EAR), 15 C.F.R. parts 730-774. Diversion contrary to U.S. law is prohibited. The export, reexport, transfer or re-transfer of this technical data to any other company, entity, person, or destination, or for any use or purpose other than that for which the technical data was originally provided by PW Power Systems (PWPS), is prohibited without prior written approval from PWPS and authorization under applicable export control laws.
EAR Export Classification: ECCN EAR99

Notes:

1. All Performance/Emissions Data submitted are subject to the sum of the following notes, and the most recent version of PWPS "Factory and Field Tests" at the time of the proposal offering. Guaranteed values are indicated by the following designations, (G) or bold/boxed, all other data are estimates.
2. The MOBILEPAC® (MP) consists of one turbine (1-GT) driving one generator. Rates are shown as per GT, and per MOBILEPAC® (MP), which are equivalent for this configuration.
3. Gaseous fuel supplied to gas turbines must meet PWPS fuel specification FR-2, liquid fuel supplied to gas turbines must meet PWPS fuel specification FR-1.
4. Data shown is based on standard combustor without water injection.
5. All data supplied based on 0m/0ft Alt. and 70% relative humidity.
6. Inlet loss estimated at 63.5mm/2.5in W.C. with 2-stage inlet filter. No correction of test results for inlet loss.
7. Exhaust loss for all cases estimated at 25.4mm/1in W.C. for standard exhaust stack. There will be no correction of test results for exhaust loss in simple-cycle.
8. Stack exhaust velocity is based on exhaust gas vol flow rate and exhaust exit area (4.63sq m/49.8sq ft).
9. Secondary (enclosure) cooling air is mixed with primary exhaust flow, before stack exit.
10. Data designated as "primary exhaust" is referenced to the GT exhaust and does not include secondary (enclosure) cooling air.
11. All data submitted is based upon a generator operating at 60Hz, 0.9 power factor @ 13.8kV.
12. Net Power = Power measured at the generator terminals, minus auxiliary load for power island and 200 kW BOP.
13. GSU losses and gas compression loads are not included in Net Power output or Net Heat Rate determinations.
14. Performance Acceptance Test for GT Net Power Output and GT Net Heat Rates to be conducted per PWPS test procedures, instrumentation, and calculations; all being in general accordance with ASME PTC-22 (2005) and PTC-19.1.
15. Performance acceptance testing for GT Net Power Output and GT Net Heat Rate shall be furnished by PWPS through third party contractor.
16. Test boundary shall be Ambient Temperature as defined by the average dry bulb temperature at the inlet filter face.
17. Site performance to be corrected for changes in ambient temperature, pressure, relative/specific humidity and power factor.
18. Thermal performance tests must be conducted in "New & Clean" condition, with less than 100 fired-hours. If Units are dispatched for Commercial Operation, or operated by Purchaser for more than 100 fired-hours, then thermal performance will have been deemed to have been met, and any thermal performance testing would be conducted and reported as "Information Only".
19. Approximately 30 days prior to performance testing of the units, Purchaser will be provided with correction curves for the GT power and heat rate, as well as draft performance acceptance test procedures. Curves and procedures will not be issued with RFQ responses.
20. Emission data is representative of steady-state operation, and may not be indicative of emissions during transient operation. Demonstration of emission concentrations for NOx, CO and VOC's are based on 1-hour averages, after operation under steady-state conditions for 1-hour. "Steady state" shall be defined as less than +/-1.3% variation from the average for power output, which is in alignment for the PTC-22 (2005) gas turbine code for steady state conditions. Compliance with shall be based on the average of stack traverse's.
21. Applications that utilize CEM systems, must use a multi-point, multiple probe system to read emissions concentrations in the backpass. This averaging system is required to prevent emission compliance issues related to diluent stratification associated with the addition of secondary (enclosure) cooling air, and the use of noise attenuation baffles in the stack.
22. Performance and emissions are based upon assumed fuel compositions shown on Sheet - 2, and significant changes from these assumed characteristics can change the quoted performance and emissions.
23. SO2 data is estimated from Sulfur contents stated on Sheet - 2, which PWPS does not control and therefore can't guarantee.
24. All emission measurements to be by US EPA methods. All emissions measurements for engine tuning, demonstration of emissions levels and/or Air Permit compliance (and related procedures), to be furnished by Purchaser, and shall conform to PWPS Quality Assurance procedure: "McHale PWPS EmissionsTuningQAProcedure 0001ETQAR3.pdf"
25. Volatile Organic Compounds (VOC) are defined as non methane, non ethane, with > 85% of the composition being ethene. Values shown are based upon PWPS experience and measurement using EPA Method 25A (total UHC) on liquid fuel, and/or Method 18 (w/Tedlar bag samples) if UHC exceeds VOC levels on gaseous fuel.
26. Testing for PM10 shall conform to PWPS Quality Assurance documentation in addition to EPA Reference Method 5 (filterable) and R/M 202 (condensable/back half) fractions. Volumetric flow rate for determination of PM10 to be per EPA Method 19, which utilized fuel flow, O2%, and F-factors.
27. Particulate samples shall be drawn isokinetically, with a minimum of 3-hour sample duration and are to consist of 3-tests. sample results are outside of specification, any suspect PM10 test shall be rejected and retested at the expense of the customer.
28. In the event that the customer does not provide emissions measurements for tuning of water injection systems which meet the requirements of the PWPS Emissions Quality Assurance document, then PWPS reserves the right to tune water/fuel ratios in accordance with our default levels.
29. In the event that the customer does not conduct emissions testing for the verification of compliance with PWPS emissions levels, or if such testing is not in accordance with PWPS Emissions Quality Assurance document, the achievement of substantial completion of the project by PWPS shall not be delayed.
30. If future emissions tuning or testing are required after the initial commissioning period when staffed by PWPS personnel and/or contractors, the additional mobilizations/demobilizations and provision of technical teams for the tuning and/or testing shall be at the customers expense.
31. Tested NOx concentrations shall be corrected lower for liquid fuel bound nitrogen (FBN) in excess of 0.015% by weight.

FT8® GAS TURBINE MOBILEPAC®

EAR Export Classification: ECCN EAR99

Assumed Fuel Properties

PREPA - ARG

The following fuel properties are assumed as representative of site fuels, based on specified data.

Specified Natural Gas			Units	
	Volume - Mol %	Hydrogen to Carbon Ratio	$H_{(mw)} / C_{(mw)}$	0.330
Methane	96.33	Hydrocarbon Molecular Weight		16.535
Ethane	3.08	Gas Molar Weight		16.635
Propane	0.16	Higher Heating Value	Btu/lb	23,748
N-Butane	0.01		kJ/kg	55,238
Isobutane	0.01		Btu/SCF	1,036
N-Pentane	0.00		kJ/Nm3	38,593
Isopentane	0.00	Lower Heating Value	Btu/lb	21,414
N-Hexane	0.00		kJ/kg	49,809
Nitrogen	0.26		Btu/SCF	934.0
CO2	0.14		kJ/Nm3	34,800
Total	100.0	Ratio HHV/LHV		1.109
		Specific Gravity		0.5743
		Assumed Max Sulfur in gas fuel	grains/100 scf	5.0
		Assumed Max Sulfur in gas fuel	mg/Nm3	121

Standard No. 2 Fuel Oil			Units	
	Weight %			
Carbon	87.12	Hydrogen to Carbon Ratio		0.1470
Hydrogen	12.80	Higher Heating Value	Btu/lb	19,858
Nitrogen	0.015		kJ/kg	46,189
Oxygen	0.010	Lower Heating Value	Btu/lb	18,646
Sulfur Max	0.050		kJ/kg	43,371
Total	100.0	Ratio HHV/LHV		1.065
		Specific Gravity		0.816

Prf CustCpy PREPA-ARG FT8-MP 60Hz_138_AS_R0_091418.xlsm

Sheet 2

EAR Export Classification: ECCN EAR99

FT8® GAS TURBINE MOBILEPAC®

Performance and Emissions

PREPA - ARG

Configuration: Dual Fuel Std. Combustor Dry, 0 m Alt., 70% RH, 60Hz PT, 60 Hz, 13.8 kV, 0.9 pf, Simple-Cycle

Performance Data																	
Fuel Type		Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas	Nat Gas
Percent of Unit Rating	%	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Number of GT's in Operation	No.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ambient Relative Humidity	%	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Ambient Temperature	Deg F	-40.0	-18.4	-10.0	4.0	10.0	20.0	30.0	43.0	50.0	59.0	70.0	80.0	85.0	90.0	100.0	110.0
Ambient Pressure	Psia	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696
Plenum Inlet Temperature	Deg F	-40.0	-18.4	-10.0	4.0	10.0	20.0	30.0	43.0	50.0	59.0	70.0	80.0	85.0	90.0	100.0	110.0
Burner Water Injection In-Service	Yes / No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Inlet Loss	Inch H2O	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Exhaust Loss	Inch H2O	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fuel LHV	Btu/lb	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414	21,414
Ratio of HHV to LHV		1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109
Gross Power Output per MP, ref Gen Term	MWe	29.742	30.365	30.610	30.950	30.934	30.929	30.102	28.885	28.255	27.260	25.988	24.723	24.111	23.529	22.446	21.433
Gross Heat Rate, LHV, ref Gen Term	Btu/kWhr	8,606	8,686	8,720	8,780	8,806	8,850	8,876	8,951	9,002	9,083	9,211	9,340	9,411	9,482	9,635	9,796
Power Isle and BOP Aux Load, per MP	kW	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269
Net Power Output, per MP	MWe	29.473	30.096	30.341	30.681	30.665	30.660	29.833	28.616	27.986	26.991	25.719	24.454	$\boxed{23.842}$	23.260	22.177	21.164
Net Heat Rate, LHV	Btu/kWhr	8,686	8,764	8,797	8,857	8,883	8,927	8,956	9,036	9,088	9,174	9,307	9,442	$\boxed{9,574}$	9,592	9,752	9,920
Fuel Flow, per GT	lbs/hr	11,955	12,317	12,465	12,690	12,720	12,762	12,477	12,074	11,877	11,563	11,178	10,783	10,596	10,419	10,100	9,804
Gaseous Fuel Flow, per GT	SCF/hr	274,097	282,398	285,789	290,952	291,642	293,054	286,061	276,832	272,314	265,116	256,274	247,221	242,932	238,883	231,558	224,785
Calc Heat Input, HHV, per GT	MMBtu/hr	284	293	296	301	302	304	296	287	282	275	265	256	252	247	240	233
Burner Water Injection Flow, per GT	gal/min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emissions & Exhaust Conditions at Stack Exit, After Addition of Secondary (Enclosure) Cooling Air *																	
NOx	ppmvd	156	174	181	194	199	207	207	208	210	211	213	214	214	214	216	217
NOx, as NO2, per GT	lbs/hr	174	200	211	230	237	247	241	235	233	228	222	215	211	208	203	198
CO	ppmvd	14.7	12.3	11.5	10.1	9.6	9.1	9.1	9.1	9.0	9.0	8.9	8.9	8.8	8.8	8.8	8.7
CO, per GT	lbs/hr	10.0	8.6	8.1	7.3	7.0	6.7	6.5	6.2	6.1	5.9	5.6	5.4	5.3	5.2	5.0	4.8
VOC as C1	ppmvd	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VOC as C1, per GT	lbs/hr	0.47	0.46	0.45	0.45	0.46	0.45	0.44	0.41	0.40	0.38	0.36	0.35	0.34	0.34	0.33	0.32
SO2	ppmvd	2.77	2.77	2.77	2.76	2.76	2.76	2.76	2.77	2.77	2.77	2.77	2.77	2.78	2.78	2.78	2.78
SO2, per GT	lbs/hr	4.31	4.44	4.49	4.57	4.58	4.60	4.49	4.35	4.28	4.17	4.03	3.88	3.82	3.75	3.64	3.53
TSP/PM10, Filterable and Cond, per MP	lbs/hr	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88
Exhaust Gas Mass Flow, per GT **	lbs/sec	290.4	281.7	278.5	273.4	271.0	267.1	261.9	254.9	250.9	245.2	237.8	230.5	227.1	223.6	217.0	210.3
Exhaust Gas Temperature **	Deg F	577	634	656	693	706	729	735	747	755	764	776	785	790	795	806	816
Exhaust Gas Molecular Weight, Wet		28.71	28.69	28.68	28.67	28.66	28.65	28.63	28.61	28.58	28.55	28.49	28.42	28.38	28.33	28.20	28.04
Exhaust Gas Vol Flow Rate, per GT **	ACFS	7,654	7,838	7,911	8,025	8,048	8,090	7,981	7,852	7,784	7,672	7,530	7,371	7,289	7,229	7,106	6,985
Stack Exhaust Exit Velocity **	ft/sec	153.7	157.4	158.9	161.2	161.6	162.5	160.3	157.7	156.3	154.1	151.2	148.0	146.6	145.2	142.7	140.3
H2O **	% Vol wet	4.02	4.29	4.40	4.62	4.71	4.88	5.00	5.23	5.41	5.71	6.22	6.85	7.24	7.70	8.83	10.32
O2 **	% Vol wet	16.49	16.22	16.10	15.91	15.85	15.73	15.73	15.71	15.68	15.64	15.56	15.46	15.40	15.32	15.11	14.82
CO2 **	% Vol wet	2.07	2.19	2.24	2.33	2.35	2.39	2.38	2.37	2.36	2.35	2.34	2.32	2.31	2.31	2.29	2.28
A **	% Vol wet	0.91	0.91	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90	0.89	0.89	0.88	0.88	0.87	0.85
N2 **	% Vol wet	76.50	76.38	76.33	76.22	76.17	76.07	75.97	75.77	75.62	75.38	74.97	74.46	74.15	73.78	72.88	71.71

* All concentrations corrected to 15% O2

** Secondary (Enclosure) Cooling Air Mixed with Primary Exhaust

All data subject to sum of Notes on Sheet - 1

Guaranteed values are indicated by (G), or | value

All other data are estimates.

Sheet - 3

Prf_CustCpy_PREPA-ARG_FT8-MP_60Hz_138_AS_R0_091418.xlsm

EAR Export Classification: ECCN EAR99

FT8® GAS TURBINE MOBILEPAC®

Performance and Emissions

PREPA - ARG

Configuration: Dual Fuel Std. Combustor Dry, 0 m Alt., 70% RH, 60Hz PT, 60 Hz, 13.8 kV, 0.9 pf, Simple-Cycle

Performance Data																	
Fuel Type		Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
Percent of Unit Rating	%	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Number of GT's in Operation	No.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ambient Relative Humidity	%	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Ambient Temperature	Deg F	-40.0	-18.4	-10.0	4.0	10.0	20.0	30.0	43.0	50.0	59.0	70.0	80.0	85.0	90.0	100.0	110.0
Ambient Pressure	Psia	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696	14.696
Plenum Inlet Temperature	Deg F	-40.0	-18.4	-10.0	4.0	10.0	20.0	30.0	43.0	50.0	59.0	70.0	80.0	85.0	90.0	100.0	110.0
Burner Water Injection In-Service	Yes / No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Inlet Loss	Inch H2O	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Exhaust Loss	Inch H2O	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fuel LHV	Btu/lb	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646	18,646
Ratio of HHV to LHV		1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065	1.065
Gross Power Output per MP, ref Gen Term	MWe	27.255	27.841	27.835	27.845	27.836	27.832	27.834	27.808	27.094	25.961	24.758	23.468	22.857	22.271	21.249	20.286
Gross Heat Rate, LHV, ref Gen Term	Btu/kWhr	8,691	8,759	8,795	8,856	8,883	8,930	8,979	9,045	9,110	9,218	9,349	9,497	9,576	9,657	9,815	9,982
Power Isle and BOP Aux Load, per MP	kW	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294
Net Power Output, per MP	MWe	26.961	27.547	27.541	27.551	27.542	27.538	27.540	27.514	26.800	25.667	24.464	23.174	22.563	21.977	20.955	19.992
Net Heat Rate, LHV	Btu/kWhr	8,786	8,853	8,889	8,950	8,977	9,025	9,074	9,142	9,210	9,323	9,461	9,618	9,759	9,786	9,953	10,129
Fuel Flow, per GT	lbs/hr	12,704	13,079	13,129	13,224	13,260	13,329	13,403	13,490	13,237	12,834	12,413	11,953	11,739	11,534	11,185	10,860
Liquid Fuel Flow, per GT	gal/min	30	31	31	31	31	31	32	32	31	30	29	28	28	27	26	26
Calc Heat Input, HHV, per GT	MMBtu/hr	252	260	261	263	263	265	266	268	263	255	246	237	233	229	222	216
Burner Water Injection Flow, per GT	gal/min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emissions & Exhaust Conditions at Stack Exit, After Addition of Secondary (Enclosure) Cooling Air *																	
NOx	ppmvd	265	322	342	378	396	428	460	504	510	517	526	529	531	534	541	546
NOx, as NO2, per GT	lbs/hr	278	347	371	413	434	472	510	562	559	548	539	521	514	508	498	488
CO	ppmvd	40.1	30.2	27.3	23.6	22.0	19.4	17.4	15.1	14.8	14.6	14.2	14.1	14.0	13.9	13.6	13.4
CO, per GT	lbs/hr	25.5	19.9	18.0	15.7	14.7	13.0	11.7	10.2	9.9	9.4	8.8	8.4	8.2	8.0	7.6	7.3
VOC as C1	ppmvd	8.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
VOC as C1, per GT	lbs/hr	3.26	1.88	1.88	1.90	1.91	1.92	1.93	1.94	1.90	1.84	1.78	1.71	1.68	1.65	1.60	1.55
SO2	ppmvd	9.57	9.55	9.54	9.54	9.54	9.54	9.54	9.54	9.55	9.57	9.57	9.58	9.59	9.59	9.60	9.60
SO2, per GT	lbs/hr	13.97	14.39	14.44	14.55	14.59	14.66	14.74	14.84	14.56	14.12	13.65	13.15	12.91	12.69	12.30	11.95
TSP/PM10, Filterable and Cond, per MP	lbs/hr	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Exhaust Gas Mass Flow, per GT **	lbs/sec	286.5	277.9	274.1	268.2	265.7	261.6	257.8	252.8	248.3	241.6	234.2	226.8	223.2	219.6	213.1	206.7
Exhaust Gas Temperature **	Deg F	553	608	627	659	673	696	719	748	757	766	779	788	793	798	809	820
Exhaust Gas Molecular Weight, Wet		28.99	28.99	28.99	28.99	28.98	28.98	28.96	28.93	28.91	28.88	28.82	28.75	28.70	28.65	28.52	28.35
Exhaust Gas Vol Flow Rate, per GT **	ACFS	7,305	7,472	7,502	7,557	7,578	7,617	7,657	7,706	7,624	7,487	7,346	7,186	7,112	7,040	6,920	6,809
Stack Exhaust Exit Velocity **	ft/sec	146.7	150.0	150.7	151.8	152.2	153.0	153.8	154.8	153.1	150.4	147.5	144.3	142.8	141.4	139.0	136.7
H2O **	% Vol wet	2.28	2.44	2.51	2.64	2.70	2.85	3.04	3.37	3.55	3.86	4.39	5.04	5.44	5.91	7.07	8.57
O2 **	% Vol wet	17.00	16.75	16.67	16.53	16.47	16.36	16.24	16.07	16.04	16.01	15.91	15.81	15.75	15.67	15.44	15.15
CO2 **	% Vol wet	2.62	2.78	2.83	2.91	2.95	3.00	3.06	3.14	3.13	3.11	3.10	3.08	3.06	3.05	3.04	3.03
A **	% Vol wet	0.92	0.92	0.92	0.92	0.92	0.91	0.91	0.91	0.91	0.91	0.90	0.89	0.89	0.89	0.87	0.86
N2 **	% Vol wet	77.17	77.09	77.06	76.98	76.94	76.85	76.71	76.48	76.33	76.08	75.66	75.14	74.82	74.45	73.54	72.35

* All concentrations corrected to 15% O2

** Secondary (Enclosure) Cooling Air Mixed with Primary Exhaust

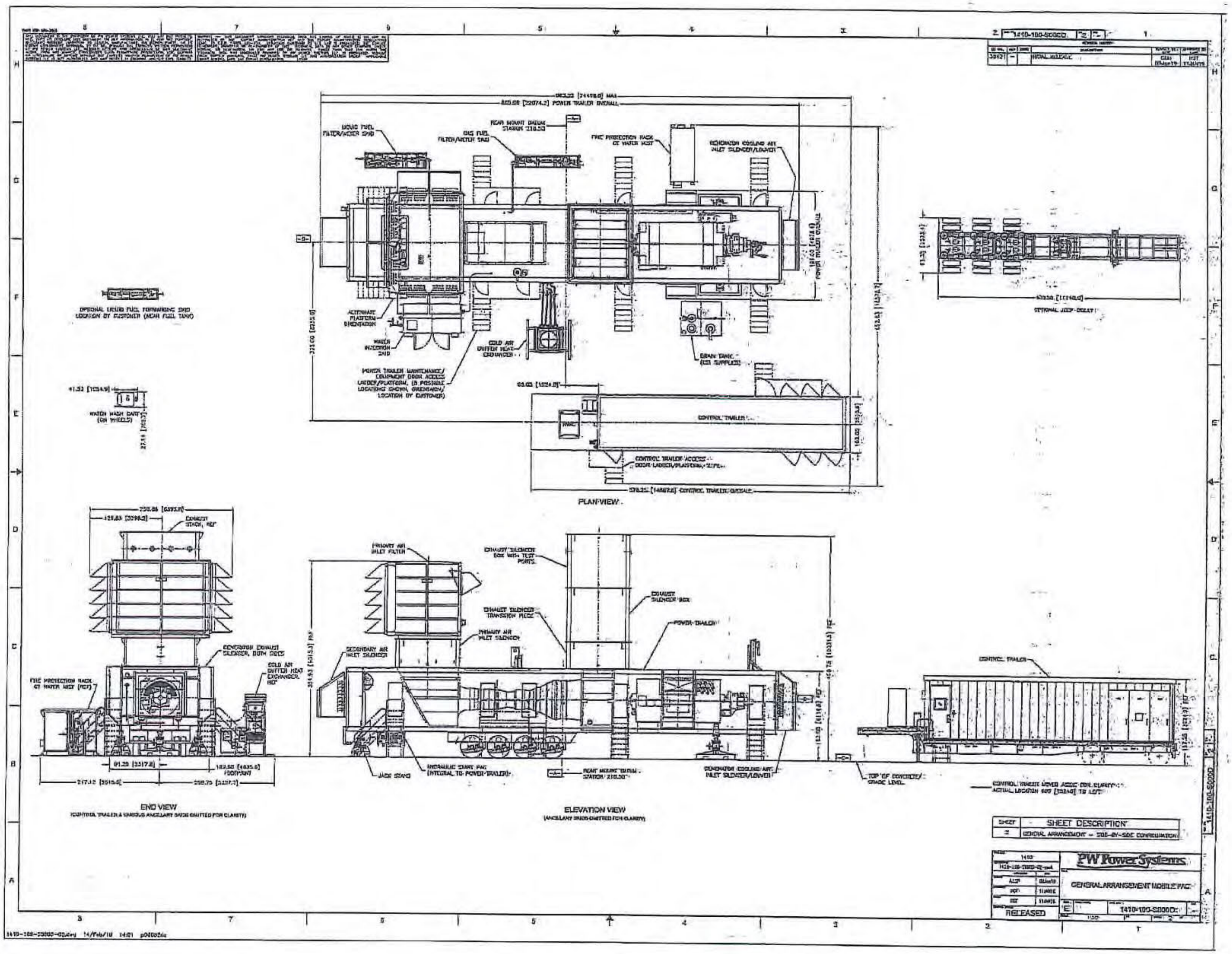
All data subject to sum of Notes on Sheet - 1

Guaranteed values are indicated by (G), or | value |

All other data are estimates.

Sheet - 5

Prf_CustCpy_PREPA-ARG_FT8-MP_60Hz_138_AS_R0_091418.xlsm


PLAN VIEW
ELEVATION VIEW
END VIEW
CONTROL TRAILER
POWER TRAILER
SHEET DESCRIPTION
GENERAL ARRANGEMENT - SIDE-BY-SIDE CONFIGURATION
PW Power Systems
GENERAL ARRANGEMENT MOBILE PAC
RELEASED
1410-100-S000D

APENDICE C

FACTORES DE EMISION, ESTIMADO DE EMISIONES

Tabla 1: Factores de Emisión para las Turbinas PW FT8 Mobilepac:

PALO SECO TURBINAS FT-8 MOBILEPAC [1]					
OPERACION EN DIESEL - DRY			OPERACION EN GAS NATURAL - DRY		
CONTAMINANTE	FACTOR DE EMISION	UNIDADES	CONTAMINANTE	FACTOR DE EMISION	UNIDADES
PM	0.0773	Lbs/MMBtu	PM	0.0233	Lbs/MMBtu
PM10	0.0773	Lbs/MMBtu	PM10	0.0233	Lbs/MMBtu
PM2.5	0.0773	Lbs/MMBtu	PM2.5	0.0233	Lbs/MMBtu
SOx	0.0554	Lbs/MMBtu	SOx (Mass Bal.)	0.0152	Lbs/MMBtu
NOx	2.206	Lbs/MMBtu	NOx	0.8373	Lbs/MMBtu
VOC	0.0072	Lbs/MMBtu	VOC	0.0013	Lbs/MMBtu
CO	0.0352	Lbs/MMBtu	CO	0.021	Lbs/MMBtu
HEAT INPUT	233	MMBtu/Hr	HEAT INPUT	252	MMBtu/Hr

Tabla 2: Estimado de Emisiones - Turbinas PW FT8 Mobilepac, período de dispensa:

PALO SECO TURBINAS FT-8 MOBILEPAC (3 UNIDADES) - DRY - BAJO LIMITE SIGNIFICATIVO DE PSD[1]			
CONTAMINANTE	PW FT8 EMISIONES PERMISIBLES (tons) PSD	PW FT8 COMBUSTIBLE PERMISIBLE - GAS (SCF)	PW FT8 COMBUSTIBLE PERMISIBLE - DIESEL (GAL)
NOx	39	91,329,802	256,217
PM	24	2,016,806,723	4,502,415
PM10	14	1,176,470,588	2,626,409
PM2.5	9	756,302,521	1,688,406
SO2	39	5,044,656,606	10,201,057
VOC	39	56,678,200,692	78,390,269
CO	99	9,229,744,728	40,768,823

[1] NOTES:

1) PW FT8 Emissions (lb/MMBtu) are based upon PW FT8 performance data at 85°F
2) PW FT8 Allowable (MMBtu/yr) based upon allowable emissions (tpy) and emission rates (lb/MMBtu) for each pollutant
3) Natural Gas Sulfur Content 5.0 gr/100 dscf
4) Fuel Oil Sulfur Content .05 % per wt
5) SO2 emissions based upon fuel sulfur content limits
6) H2SO4 emissions based upon 10% conversion of SO2 to H2SO4
7) Heating Value Fuel Oil .138 MMBtu/Gal
8) Heating Value Natural Gas .00102 MMBtu/SCF
9) NOx PSD Limiting Pollutant

EFRAN PAREDES MAISONET
INGENIERO LICENCIADO
LIC. #17776
PUERTO RICO

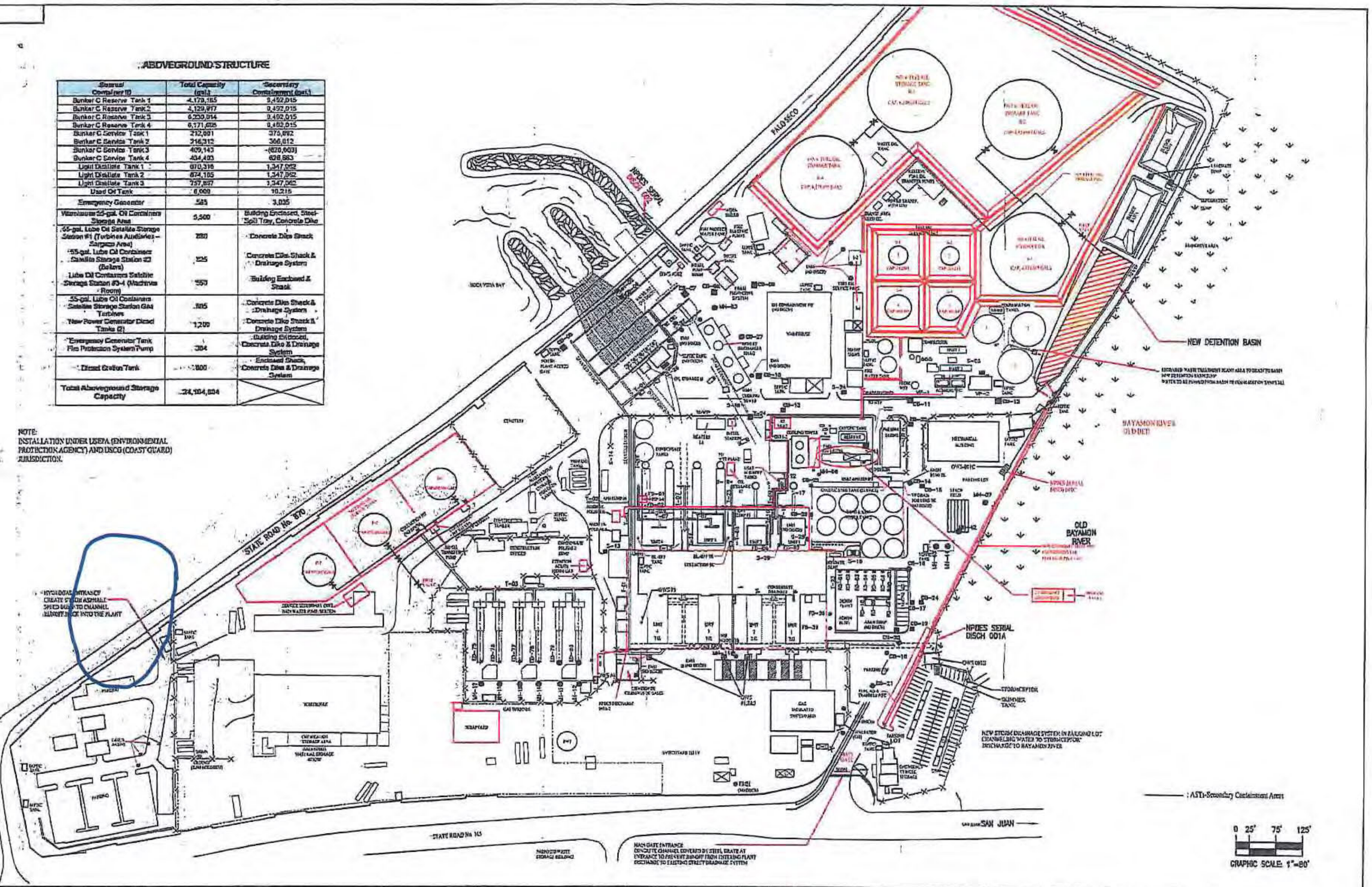
APENDICE D

PLANO DE SITIO – CENTRAL PALO SECO

ABOVEGROUND STRUCTURE

General Container ID	Total Capacity (gal.)	Secondary Containment (gal.)
Bunker C Reserve Tank 1	4,179,185	9,492,015
Bunker C Reserve Tank 2	4,129,917	9,492,015
Bunker C Reserve Tank 3	6,200,014	9,492,015
Bunker C Reserve Tank 4	6,171,605	9,492,015
Bunker C Service Tank 1	212,881	376,892
Bunker C Service Tank 2	216,312	366,012
Bunker C Service Tank 3	409,143	(628,603)
Bunker C Service Tank 4	434,403	628,663
Light Distillate Tank 1	670,316	1,347,062
Light Distillate Tank 2	674,165	1,347,062
Light Distillate Tank 3	757,857	1,347,062
Used Oil Tank	6,000	10,215
Emergency Generator	585	3,035
Warehouse 55-gal. Oil Containers Storage Area	5,500	Building Enclosed, Steel-Spill Tray, Concrete Dike
55-gal. Lube Oil Satellite Storage Station #1 (Turbines Auxiliaries – Sargazo Area)	880	Concrete Dike Shack
55-gal. Lube Oil Containers Satellite Storage Station #2 (Boilers)	825	Concrete Dike Shack & Drainage System
Lube Oil Containers Satellite Storage Station #3-4 (Machines Room)	550	Building Enclosed & Shack
55-gal. Lube Oil Containers Satellite Storage Station Gas Turbines	605	Concrete Dike Shack & Drainage System
New Power Generator Diesel Tanks (2)	1,200	Concrete Dike Shack & Drainage System
Emergency Generator Tank Fire Protection System Pump	384	Building Enclosed, Concrete Dike & Drainage System
Diesel Gallon Tank	800	Enclosed Shack, Concrete Dike & Drainage System
Total Aboveground Storage Capacity	24,104,034	

NOTE:
INSTALLATION UNDER USEPA (ENVIRONMENTAL PROTECTION AGENCY) AND USCG (COAST GUARD) JURISDICTION.



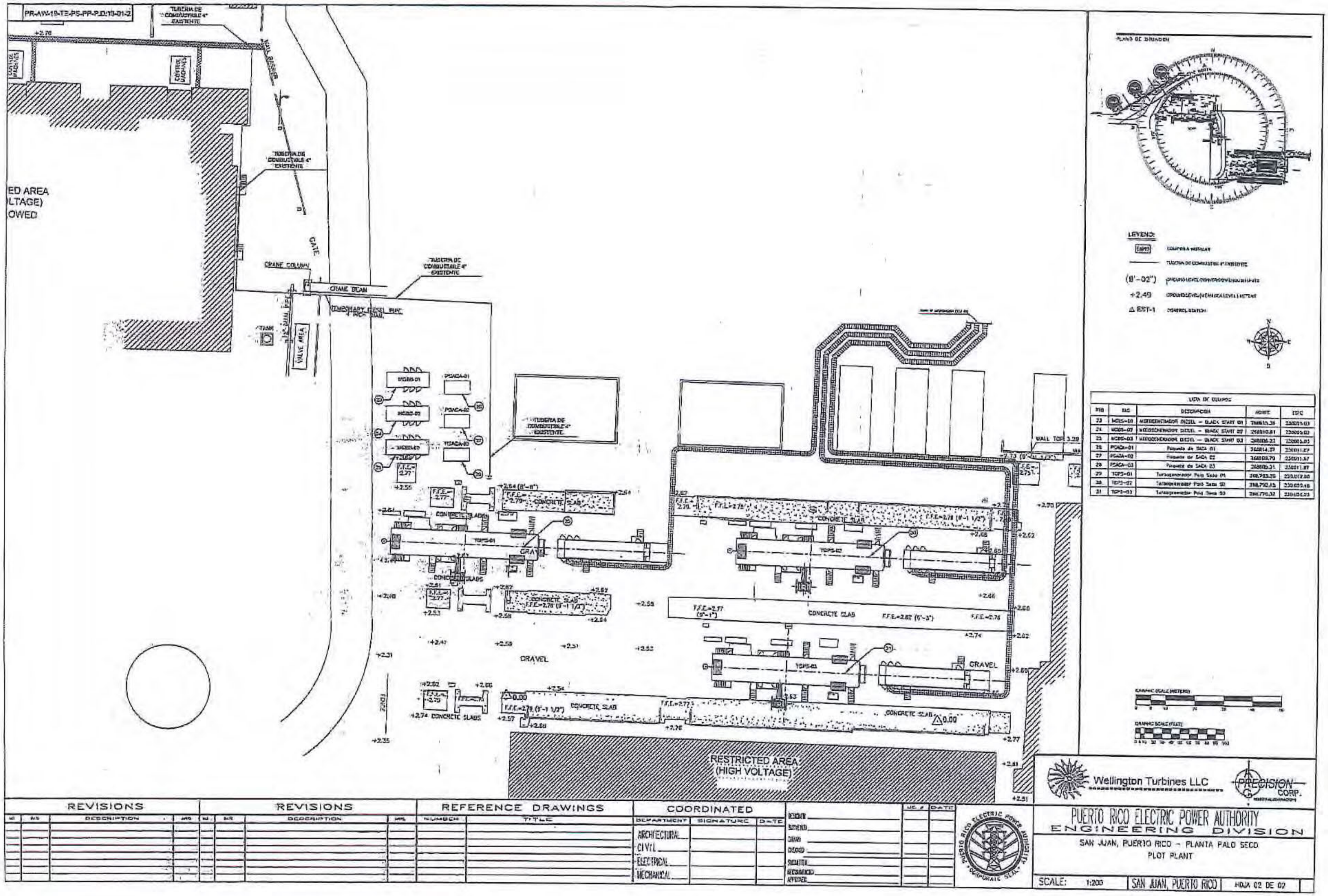
REVISIONS			REVISIONS			REFERENCE DRAWINGS		COORDINATED		
NO. DATE	DESCRIPTION	APPR.	NO. DATE	DESCRIPTION	APPR.	NUMBER	TITLE	DEPARTMENT	SIGNATURE	DATE
								ARCHITECTURAL		
								CIVIL		
								ELECTRICAL		
								MECHANICAL		

DESIGNED / SURVEYED / DRAWN / CHECKED / SUBMITTED / RECOMMENDED / APPROVED

PUERTO RICO ELECTRIC POWER AUTHORITY
WATER QUALITY DEPARTMENT

PALO SECO STEAM PLANT
SITE PLAN – SPCCP

SCALE: | SAN JUAN PUERTO RICO | November 2014



PR-AW-19-TE-PS-PP-P.D.19-01-2
TUBERIA DE COMBUSTIBLE 4" EXISTENTE
GATE
CRANE COLUMN
CRANE BEAM
TEMPORARY DIESEL PIPE
VALVE AREA
TANK
MDBS-01
MDBS-02
PSACA-01
PSACA-02
PSACA-03
TGPS-01
TGPS-02
TGPS-03
CONCRETE SLAB
CONCRETE SLABS
GRAVEL
WALL TOP 3.29
RESTRICTED AREA
(HIGH VOLTAGE)
PLANO DE SITUACION
LEYENDA:
LISTA DE EQUIPOS
REVISIONS
REFERENCE DRAWINGS
COORDINATED
ARCHITECTURAL
CIVIL
ELECTRICAL
MECHANICAL
Wellington Turbines LLC
PRECISION CORP.
PUERTO RICO ELECTRIC POWER AUTHORITY
ENGINEERING DIVISION
SAN JUAN, PUERTO RICO - PLANTA PALO SECO
PLOT PLANT
SCALE: 1:200
SAN JUAN, PUERTO RICO
HOJA 02 DE 02

Appendix E:

Black Start Generator Manufacturer's Emissions Certification

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2019 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Caterpillar Inc.**
(U.S. Manufacturer or Importer)
Certificate Number: KCPXL12.5NYS-006

Effective Date:
07/24/2018
Expiration Date:
12/31/2019

Byron J. Bunker, Division Director
Compliance Division

Issue Date:
07/24/2018
Revision Date:
N/A

Model Year: 2019
Manufacturer Type: Original Engine Manufacturer
Engine Family: KCPXL12.5NYS

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 225<=kW<450
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Smoke Puff Limiter, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

CATERPILLAR

Engine Emissions Data

For Emissions / Certification feedback and questions, please submit a ticket via our ERC Request Portal

This emission data is Caterpillar's best estimate for this rating. If actual emissions are required then an emission test needs to be run on your engine.

Serial Number (Machine)	
Serial Number (Engine)	**PW300837**
Sales Model	C13
Regulatory Build Date	19-AUG-2019
As Shipped Data	
Engine Arrangement Number	5066872
Certification Arrangement	3662120
Test Spec Number	0K9333
Regulatory Status	EPA Emergency Stationary @ Constant Speed
Labeled Model Year	2019
EPA Family Code	KCPXL12.5NYS
Current Flash file	5607704
Flash File Progression	5607704
CORR FL Power at RPM	620 HP (462.0 KW)1800 RPM
Advertised Power	609 HP 1,800RPM
Total Displacement	12.5

Disclaimer: The information provided has been compiled from third party sources and is accurate to the best of Caterpillar's knowledge. However, Caterpillar cannot guarantee the accuracy, completeness, or validity of the information and is not liable for any errors or omissions contained therein. All information provided should be independently verified and confirmed, including by examining the emissions label located on the engine.

Need emission replacement label? Click here!

Caterpillar Confidential: **Green**
Content Owner: Commercial Processes Division
Web Master(s): PSG Web Based Systems Support
Current Date: 10/24/2019 9:39:20 AM

Data Privacy Statement.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2018 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Caterpillar Inc.**
(U.S. Manufacturer or Importer)
Certificate Number: JCPXL12.5NYS-005

Effective Date: 06/19/2017
Expiration Date: 12/31/2018

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 06/19/2017
Revision Date: N/A

Model Year: 2018
Manufacturer Type: Original Engine Manufacturer
Engine Family: JCPXL12.5NYS

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 225<=kW<450
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Smoke Puff Limiter, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

CATERPILLAR

Engine Emissions Data

For Emissions / Certification feedback and questions, please submit a ticket via our ERC Request Portal

This emission data is Caterpillar's best estimate for this rating. If actual emissions are required then an emission test needs to be run on your engine.

Serial Number (Machine)	
Serial Number (Engine)	**PW300530**
Sales Model	C13
Regulatory Build Date	30-JUL-2018
As Shipped Data	
Engine Arrangement Number	5066872
Certification Arrangement	
Test Spec Number	0K9333
Regulatory Status	EPA Emergency Stationary @ Constant Speed
Labeled Model Year	2018
EPA Family Code	JCPXL12.5NYS
Current Flash file	5607704
Flash File Progression	5607704
CORR FL Power at RPM	620 HP (462.0 KW)1800 RPM
Advertised Power	609 HP 1,800RPM
Total Displacement	12.5

Disclaimer: The information provided has been compiled from third party sources and is accurate to the best of Caterpillar's knowledge. However, Caterpillar cannot guarantee the accuracy, completeness, or validity of the information and is not liable for any errors or omissions contained therein. All information provided should be independently verified and confirmed, including by examining the emissions label located on the engine.

Need emission replacement label? Click here!

Caterpillar Confidential: **Green**

Content Owner: Commercial Processes Division
Web Master(s): PSG Web Based Systems Support
Current Date: 10/24/2019 9:53:19 AM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2018 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Caterpillar Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: JCPXL12.5NYS-005

Effective Date: 06/19/2017

Expiration Date: 12/31/2018

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 06/19/2017

Revision Date: N/A

Model Year: 2018
Manufacturer Type: Original Engine Manufacturer
Engine Family: JCPXL12.5NYS

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 225<=kW<450
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Smoke Puff Limiter, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

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CATERPILLAR

Engine Emissions Data

For Emissions / Certification feedback and questions, please submit a ticket via our ERC Request Portal

This emission data is Caterpillar's best estimate for this rating. If actual emissions are required then an emission test needs to be run on your engine.

Serial Number (Machine)	
Serial Number (Engine)	**PW300535**
Sales Model	C13
Regulatory Build Date	01-AUG-2018
As Shipped Data	
Engine Arrangement Number	5066872
Certification Arrangement	
Test Spec Number	0K9333
Regulatory Status	EPA Emergency Stationary @ Constant Speed
Labeled Model Year	2018
EPA Family Code	JCPXL12.5NYS
Current Flash file	5607704
Flash File Progression	5607704
CORR FL Power at RPM	620 HP (462.0 KW)1800 RPM
Advertised Power	609 HP 1,800RPM
Total Displacement	12.5

Disclaimer: The information provided has been compiled from third party sources and is accurate to the best of Caterpillar's knowledge. However, Caterpillar cannot guarantee the accuracy, completeness, or validity of the information and is not liable for any errors or omissions contained therein. All information provided should be independently verified and confirmed, including by examining the emissions label located on the engine.

Need emission replacement label? Click here!

Caterpillar Confidential: **Green**
Content Owner: Commercial Processes Division
Web Master(s): PSG Web Based Systems Support
Current Date: 10/24/2019 9:47:33 AM

Data Privacy Statement.

PERFORMANCE DATA[EM1694]

October 24, 2019

Performance Number: EM1694 **Change Level: 02**

SALES MODEL:	C13
BRAND:	CAT
ENGINE POWER (BHP):	609
GEN POWER WITH FAN (EKW):	400.0
COMPRESSION RATIO:	16.3
RATING LEVEL:	STANDBY
PUMP QUANTITY:	1
FUEL TYPE:	DIESEL
MANIFOLD TYPE:	DRY
GOVERNOR TYPE:	ELEC
ELECTRONICS TYPE:	ADEM4
CAMSHAFT TYPE:	STANDARD
IGNITION TYPE:	CI
INJECTOR TYPE:	EUI
REF EXH STACK DIAMETER (IN):	5
MAX OPERATING ALTITUDE (FT):	1,640
COMBUSTION:	DIRECT INJECTION
ENGINE SPEED (RPM):	1,800
HERTZ:	60
FAN POWER (HP):	20.1
ADDITIONAL PARASITICS (HP):	10.4
ASPIRATION:	TA
AFTERCOOLER TYPE:	ATAAC
AFTERCOOLER CIRCUIT TYPE:	JW+OC, ATAAC
INLET MANIFOLD AIR TEMP (F):	120
JACKET WATER TEMP (F):	192.2
TURBO CONFIGURATION:	SINGLE
TURBO QUANTITY:	1
TURBOCHARGER MODEL:	GTA5002BS 1.60A/R
CERTIFICATION YEAR:	2015
PISTON SPD @ RATED ENG SPD (FT/MIN):	1,854.3

INDUSTRY	SUBINDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET

General Performance Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
400.0	100	609	351	0.326	28.4	56.6	117.0	1,287.5	38.0	1,058.8
360.0	90	546	315	0.326	25.4	50.2	112.8	1,239.3	32.8	1,026.2
320.0	80	486	280	0.355	24.6	53.7	115.3	1,243.0	36.2	1,014.2
300.0	75	457	263	0.367	24.0	54.1	115.3	1,242.2	36.6	1,006.9
280.0	70	428	247	0.373	22.8	51.8	113.2	1,230.3	34.6	994.7
240.0	60	372	214	0.381	20.3	45.8	108.4	1,193.6	30.2	964.8
200.0	50	316	182	0.387	17.5	37.8	103.0	1,140.2	25.0	927.6
160.0	40	261	151	0.389	14.5	27.4	96.5	1,080.7	18.9	889.3
120.0	30	206	119	0.390	11.5	17.1	90.3	998.9	12.9	840.0
100.0	25	178	102	0.392	9.9	12.4	87.5	948.6	10.3	810.6
80.0	20	149	86	0.396	8.4	8.5	85.3	886.6	8.2	770.9
40.0	10	90.8	52	0.427	5.5	3.6	82.6	689.5	5.6	609.6

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
400.0	100	609	61	357.2	978.1	2,936.2	4,292.2	4,490.4	950.7	854.7
360.0	90	546	54	330.0	915.9	2,656.6	3,998.8	4,176.7	879.0	792.5
320.0	80	486	58	344.8	970.5	2,788.5	4,248.8	4,421.0	930.2	846.5
300.0	75	457	59	347.3	982.7	2,801.1	4,301.0	4,468.6	939.1	857.4
280.0	70	428	56	338.9	963.1	2,705.2	4,203.1	4,362.5	914.6	836.0
240.0	60	372	50	314.6	901.9	2,463.5	3,915.9	4,057.6	850.3	779.2
200.0	50	316	41	280.3	812.5	2,156.6	3,510.3	3,632.6	764.3	702.0
160.0	40	261	30	234.0	687.0	1,781.4	2,955.8	3,057.3	649.3	597.7
120.0	30	206	19	186.1	559.5	1,398.1	2,396.3	2,476.6	528.9	488.0
100.0	25	178	14	163.5	501.9	1,216.0	2,144.3	2,213.9	470.7	434.8
80.0	20	149	10	143.6	454.1	1,050.9	1,934.8	1,994.0	419.9	388.7
40.0	10	90.8	5	114.6	397.9	789.9	1,686.8	1,725.7	363.2	341.4

Heat Rejection Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHUAST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY

PERFORMANCE DATA[EM1694]

October 24, 2019

EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
400.0	100	609	8,952	2,925	23,022	13,776	3,243	4,130	25,831	60,887	64,860
360.0	90	546	8,186	2,654	20,622	12,177	2,905	3,479	23,152	54,534	58,093
320.0	80	486	7,906	2,618	21,212	12,600	2,812	3,904	20,601	52,796	56,241
300.0	75	457	7,710	2,546	21,145	12,570	2,738	3,995	19,365	51,406	54,761
280.0	70	428	7,378	2,442	20,304	12,022	2,604	3,800	18,150	48,885	52,075
240.0	60	372	6,706	2,418	18,182	10,623	2,315	3,233	15,765	43,469	46,305
200.0	50	316	6,033	2,483	15,558	8,900	1,999	2,492	13,418	37,535	39,984
160.0	40	261	5,465	2,508	12,515	6,965	1,660	1,628	11,079	31,161	33,194
120.0	30	206	4,843	2,208	9,534	5,102	1,312	920	8,725	24,624	26,230
100.0	25	178	4,472	1,897	8,187	4,276	1,137	653	7,535	21,350	22,743
80.0	20	149	4,040	1,542	6,945	3,504	965	452	6,327	18,124	19,307
40.0	10	90.8	2,963	1,112	4,536	1,834	634	216	3,852	11,904	12,681

Emissions Data

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN		EKW	400.0	300.0	200.0	100.0	40.0
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	609	457	316	178	90.8
TOTAL NOX (AS NO2)		G/HR	2,977	1,068	588	577	371
TOTAL CO		G/HR	1,386	852	1,107	1,159	773
TOTAL HC		G/HR	11	34	57	58	82
PART MATTER		G/HR	61.3	65.7	37.7	32.1	44.3
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	2,481.2	1,040.3	779.4	1,396.4	1,483.0
TOTAL CO	(CORR 5% O2)	MG/NM3	1,150.6	842.7	1,484.4	2,885.1	3,110.1
TOTAL HC	(CORR 5% O2)	MG/NM3	7.5	28.5	66.0	127.6	338.9
PART MATTER	(CORR 5% O2)	MG/NM3	41.1	52.9	42.2	66.9	189.6
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,209	507	380	680	722
TOTAL CO	(CORR 5% O2)	PPM	920	674	1,188	2,308	2,488
TOTAL HC	(CORR 5% O2)	PPM	14	53	123	238	633
TOTAL NOX (AS NO2)		G/HP-HR	4.98	2.36	1.87	3.26	4.10
TOTAL CO		G/HP-HR	2.32	1.88	3.52	6.55	8.55
TOTAL HC		G/HP-HR	0.02	0.08	0.18	0.33	0.90
PART MATTER		G/HP-HR	0.10	0.15	0.12	0.18	0.49
TOTAL NOX (AS NO2)		LB/HR	6.56	2.36	1.30	1.27	0.82
TOTAL CO		LB/HR	3.05	1.88	2.44	2.55	1.71
TOTAL HC		LB/HR	0.02	0.07	0.13	0.13	0.18
PART MATTER		LB/HR	0.14	0.14	0.08	0.07	0.10

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN		EKW	400.0	300.0	200.0	100.0	40.0
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	609	457	316	178	90.8
TOTAL NOX (AS NO2)		G/HR	2,757	989	544	534	343
TOTAL CO		G/HR	741	456	592	620	414
TOTAL HC		G/HR	6	18	30	30	43
TOTAL CO2		KG/HR	275	236	172	98	55
PART MATTER		G/HR	31.4	33.7	19.4	16.5	22.7
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	2,297.5	963.2	721.7	1,293.0	1,373.1
TOTAL CO	(CORR 5% O2)	MG/NM3	615.3	450.6	793.8	1,542.8	1,663.2
TOTAL HC	(CORR 5% O2)	MG/NM3	4.0	15.1	34.9	67.5	179.3
PART MATTER	(CORR 5% O2)	MG/NM3	21.1	27.1	21.7	34.3	97.2
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,119	469	352	630	669
TOTAL CO	(CORR 5% O2)	PPM	492	361	635	1,234	1,331
TOTAL HC	(CORR 5% O2)	PPM	7	28	65	126	335
TOTAL NOX (AS NO2)		G/HP-HR	4.61	2.19	1.73	3.02	3.80
TOTAL CO		G/HP-HR	1.24	1.01	1.88	3.50	4.57
TOTAL HC		G/HP-HR	0.01	0.04	0.10	0.17	0.48
PART MATTER		G/HP-HR	0.05	0.07	0.06	0.09	0.25
TOTAL NOX (AS NO2)		LB/HR	6.08	2.18	1.20	1.18	0.76
TOTAL CO		LB/HR	1.63	1.00	1.31	1.37	0.91
TOTAL HC		LB/HR	0.01	0.04	0.07	0.07	0.10
TOTAL CO2		LB/HR	605	520	378	215	121
PART MATTER		LB/HR	0.07	0.07	0.04	0.04	0.05
OXYGEN IN EXH		%	7.4	9.6	10.8	11.8	14.4
DRY SMOKE OPACITY		%	1.7	1.1	1.0	2.9	2.0
BOSCH SMOKE NUMBER			1.11	0.75	0.70	1.72	1.27

Regulatory Information

EPA EMERGENCY STATIONARY		2011 - ----		
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE EMERGENCY STATIONARY REGULATIONS.				
Locality	**Agency**	**Regulation**	**Tier/Stage**	**Max Limits - G/BKW - HR**
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 4.0 PM: 0.20

Altitude Derate Data

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	30	40	50	60	70	80	90	100	110	120	130	140	NORMAL
ALTITUDE (FT)													
0	609	609	609	609	609	609	609	609	609	600	590	580	609
1,000	609	609	609	609	609	609	609	598	588	578	568	558	609
2,000	609	609	609	609	609	597	587	576	566	556	547	538	607
3,000	609	609	609	597	586	575	564	554	545	535	526	517	588
4,000	609	597	586	574	564	553	543	533	524	515	506	498	570
5,000	586	575	563	552	542	532	522	513	504	495	487	479	552
6,000	564	552	542	531	521	511	502	493	484	476	468	460	534
7,000	542	531	520	510	501	492	483	474	466	458	450	442	517
8,000	520	510	500	490	481	472	464	455	447	440	432	425	500
9,000	500	490	480	471	462	454	445	437	430	422	415	408	484
10,000	480	470	461	452	444	435	427	420	412	405	398	392	467
11,000	460	451	442	434	426	418	410	403	396	389	382	376	452
12,000	442	433	424	416	408	401	393	386	380	373	367	361	437
13,000	424	415	407	399	392	384	377	371	364	358	352	346	422
14,000	406	398	390	382	375	368	362	355	349	343	337	331	407
15,000	389	381	374	366	359	353	346	340	334	328	323	318	393

Cross Reference

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
0K9333	PP7710	4343726	PG045	LS	PW300001	

Performance Parameter Reference

Parameters Reference:DM9600-11
PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600
APPLICATION:
Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.
PERFORMANCE PARAMETER TOLERANCE FACTORS:
Power +/- 3%
Torque +/- 3%
Exhaust stack temperature +/- 8%

PERFORMANCE DATA[EM1694]

Inlet airflow +/- 5%
Intake manifold pressure-gage +/- 10%
Exhaust flow +/- 6%
Specific fuel consumption +/- 3%
Fuel rate +/- 5%
Specific DEF consumption +/- 3%
DEF rate +/- 5%
Heat rejection +/- 5%
Heat rejection exhaust only +/- 10%
Heat rejection CEM only +/- 10%
Heat Rejection values based on using treated water.
Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.
On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.
These values do not apply to C280/3600. For these models, see the tolerances listed below.
C280/3600 HEAT REJECTION TOLERANCE FACTORS:
Heat rejection +/- 10%
Heat rejection to Atmosphere +/- 50%
Heat rejection to Lube Oil +/- 20%
Heat rejection to Aftercooler +/- 5%
TEST CELL TRANSDUCER TOLERANCE FACTORS:
Torque +/- 0.5%
Speed +/- 0.2%
Fuel flow +/- 1.0%
Temperature +/- 2.0 C degrees
Intake manifold pressure +/- 0.1 kPa
OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.
REFERENCE ATMOSPHERIC INLET AIR
FOR 3500 ENGINES AND SMALLER
SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.
FOR 3600 ENGINES
Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.
MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE
Location for air temperature measurement air cleaner inlet at stabilized operating conditions.
REFERENCE EXHAUST STACK DIAMETER
The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.
REFERENCE FUEL
DIESEL
Reference fuel is #2 distillate diesel with a 35API gravity;
A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 29 deg C (84.2 deg F), where the density is 838.9 G/Liter (7.001 Lbs/Gal).
GAS
Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.
ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD
Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.
ALTITUDE CAPABILITY
Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set.
Standard temperature values versus altitude could be seen on TM2001.
When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.
Engines with ADEM MEUI and HEUI fuel systems operating at

conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001.

Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE

TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.

Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

EMISSION CYCLE LIMITS:

Cycle emissions Max Limits apply to cycle-weighted averages only. Emissions at individual load points may exceed the cycle-weighted limit.

EMISSIONS DEFINITIONS:

Emissions : DM1176

EMISSION CYCLE DEFINITIONS

1. For constant-speed marine engines for ship main propulsion, including,diesel-electric drive, test cycle E2 shall be applied, for controllable-pitch propeller sets test cycle E2 shall be applied.
2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.
3. For constant-speed auxiliary engines test cycle D2 shall be applied.
4. For variable-speed, variable-load auxiliary engines, not included above, test cycle C1 shall be applied.

HEAT REJECTION DEFINITIONS:

Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS:

3500: EM1500

RATING DEFINITIONS:

Agriculture : TM6008
Fire Pump : TM6009
Generator Set : TM6035
Generator (Gas) : TM6041
Industrial Diesel : TM6010
Industrial (Gas) : TM6040
Irrigation : TM5749
Locomotive : TM6037
Marine Auxiliary : TM6036
Marine Prop (Except 3600) : TM5747
Marine Prop (3600 only) : TM5748
MSHA : TM6042
Oil Field (Petroleum) : TM6011
Off-Highway Truck : TM6039
On-Highway Truck : TM6038

SOUND DEFINITIONS:

Sound Power : DM8702
Sound Pressure : TM7080

Date Released : 07/10/19

Appendix F:

Site and Project Figures

Google Maps

Imágenes © 2019 Google, Imágenes © 2019 CNES / Airbus, Maxar Technologies, U.S. Geological Survey, Datos del mapa © 2019 50 m

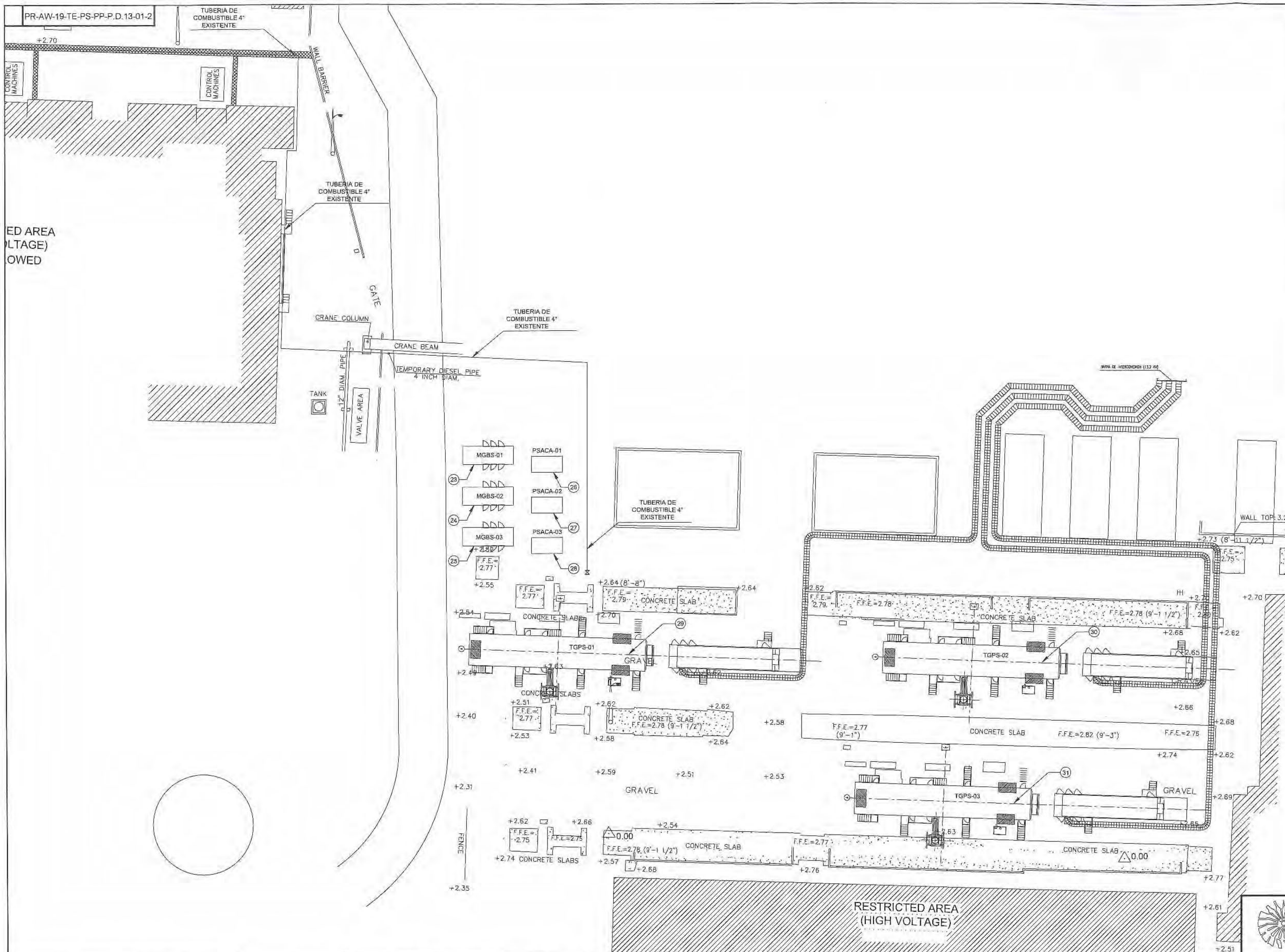
Casa
Establecer ubicación

Ubicación	
Catastro	039-000-008-04
[redacted]	
Area Aprox. (m.c.)	922526.0056
Municipio	Toa Baja (95.0%), Cataño (5.0%)
Barrio	Palo Seco (89.3%), Sabana Seca (5.7%), Palmas (5.0%)
Características Ambientales	
Zona Inundabilidad	X (67.5%), 0.2 PCT (33.2%), AE (9.1%), VE (0.2%)
Zona Inund. Advisory	AE (55.8%), A (27.3%), X 0.2% ACF (11.2%), Coastal A Zone (0.8%), VE (0.2%)
Panel Inundabilidad	72000C0335J
Floodway	
Suelo (NRCS)	Ud (82.6%), Hy (13.3%), W (4.0%), Sm (0.1%)
Calificación y Clasificación de Suelo	
Calificación	Oficializacion del geodato en proceso, favor de referirse al mapa de calificacion vigente.
Clasificación PT	Oficializacion del geodato en proceso, favor de referirse al mapa de calificacion vigente.
Clasificación PUT	SU (97%), AGUA (2%), VIAL (1%)
Mapas de Calificación	Hoja: 032 de Toa Baja, Mapa PUT, Cataño
Distrito Sobrepuesto	APE-ZC (Área de Planificación Especial Zona Cársica)
Zona Histórica	
Sitio Histórico	
Reglamento Aplicable	• Plan de Uso de Terrenos • Plan de Área 5 Frente Marítimo Toa Baja • Plan de Área 5 Frente Marítimo Toa Baja
Vigencia de Clasificación PUT	30-nov-2015
Vigencia de GeoDato de Calificación	4/10/2008
Status POT	Municipio Autónomo

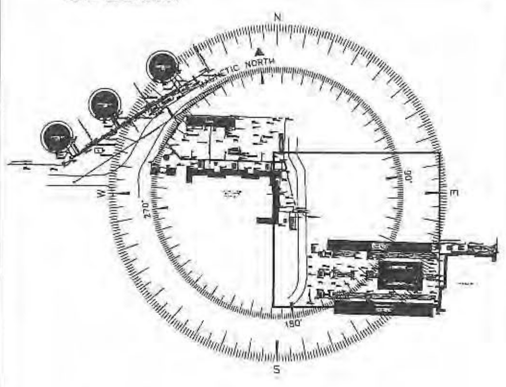
(oprima para definir título)


ESTADO LIBRE ASOCIADO DE
PUERTO RICO
Junta de Planificación
[-]
(oprima para definir título)
N
0 200 400ft
Junta de Planificación

PR-AW-19-TE-PS-PP-P.D.13-01-2



PLANO DE SITUACION



LEYEND:

	EQUIPOS A INSTALAR
	TUBERIA DE COMBUSTIBE 4" EXISTENTE
(8'-02")	GROUND LEVEL CONVERSION ENGLISH UNITS
+2.49	GROUND LEVEL (MEAN SEA LEVEL) METERS
△ EST-1	CONTROL STATION

LISTA DE EQUIPOS				
PTO	TAG	DESCRIPCION	NORTE	ESTE
23	MGBS-01	MOTOGENERADOR DIESEL – BLACK START 01	268815.39	230005.03
24	MGBS-02	MOTOGENERADOR DIESEL – BLACK START 02	268810.81	230005.03
25	MGBS-03	MOTOGENERADOR DIESEL – BLACK START 03	268806.23	230005.03
26	PSACA-01	Paquete de SACA 01	268814.37	230011.67
27	PSACA-02	Paquete de SACA 02	268809.79	230011.67
28	PSACA-03	Paquete de SACA 03	268805.21	230011.67
29	TGPS-01	Turbogenerador Palo Seco 01	268.793.20	230.012.88
30	TGPS-02	Turbogenerador Palo Seco 02	268.792.15	230.059.46
31	TGPS-03	Turbogenerador Palo Seco 03	268.776.32	230.056.23

GRAPHIC SCALE (METERS)

0 5 10 20 30 40 50

GRAPHIC SCALE (FEET)

0 5 10 20 30 40 50 60 70 80 90 100

Wellington Turbines LLC

PRECISION CORP.
INDUSTRIAL CONTRACTORS

REVISIONS				REVISIONS				REFERENCE DRAWINGS	
NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NUMBER	TITLE

COORDINATED		
DEPARTMENT	SIGNATURE	DATE
ARCHITECTURAL		
CIVIL		
ELECTRICAL		
MECHANICAL		

DESIGNED
SURVEYED
DRAWN
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

LIC. # | DATE

PUERTO RICO ELECTRIC POWER AUTHORITY CORPORATE SEAL

PUERTO RICO ELECTRIC POWER AUTHORITY
ENGINEERING DIVISION

SAN JUAN, PUERTO RICO – PLANTA PALO SECO

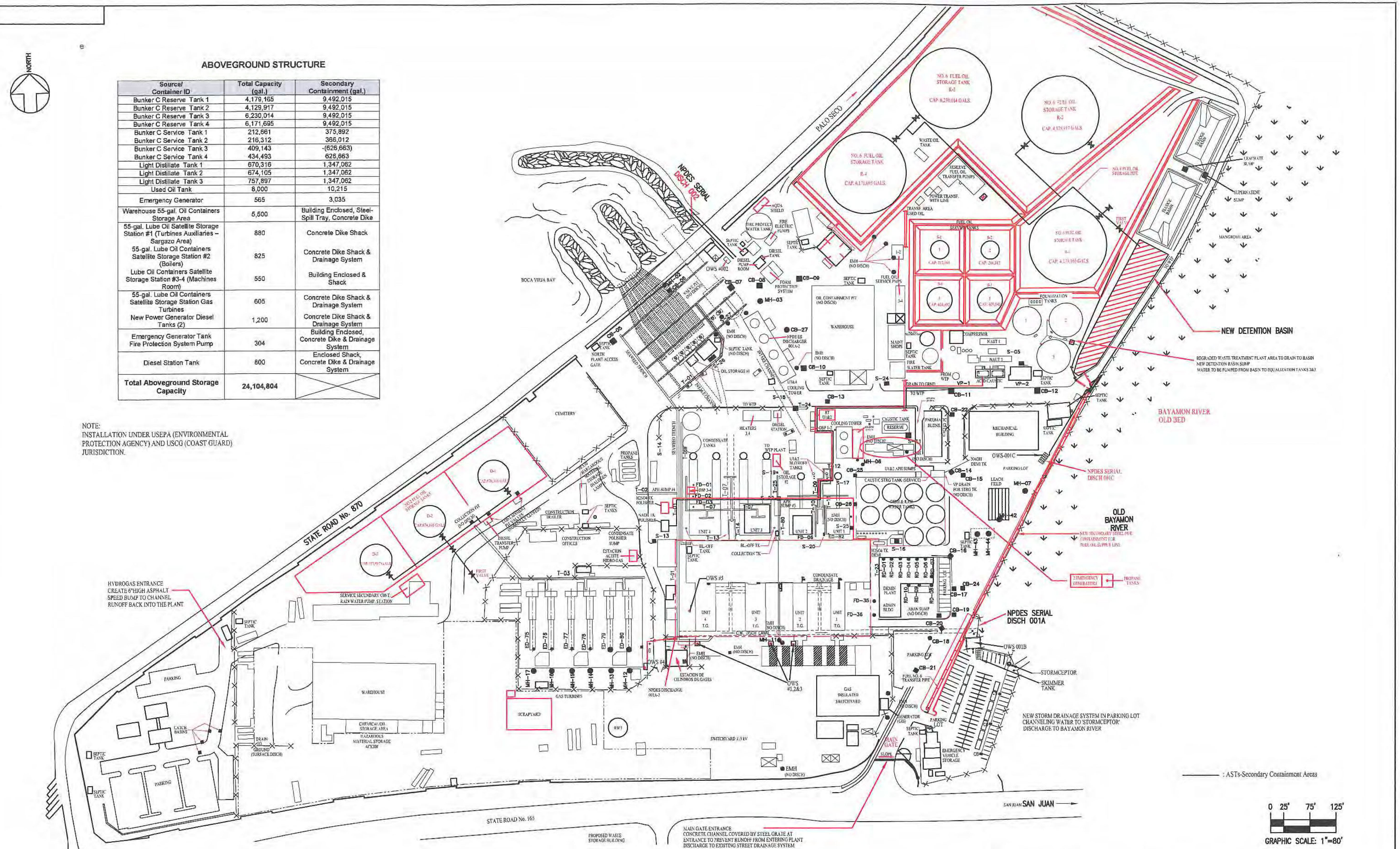
PLOT PLANT

SCALE: 1:200 | SAN JUAN, PUERTO RICO | HOJA 02 DE 02

ABOVEGROUND STRUCTURE

Source/ Container ID	Total Capacity (gal.)	Secondary Containment (gal.)
Bunker C Reserve Tank 1	4,179,165	9,492,015
Bunker C Reserve Tank 2	4,129,917	9,492,015
Bunker C Reserve Tank 3	6,230,014	9,492,015
Bunker C Reserve Tank 4	6,171,695	9,492,015
Bunker C Service Tank 1	212,661	375,892
Bunker C Service Tank 2	216,312	366,012
Bunker C Service Tank 3	409,143	-(626,663)
Bunker C Service Tank 4	434,493	626,663
Light Distillate Tank 1	670,316	1,347,062
Light Distillate Tank 2	674,105	1,347,062
Light Distillate Tank 3	757,897	1,347,062
Used Oil Tank	8,000	10,215
Emergency Generator	565	3,035
Warehouse 55-gal. Oil Containers Storage Area	5,500	Building Enclosed, Steel-Spill Tray, Concrete Dike
55-gal. Lube Oil Satellite Storage Station #1 (Turbines Auxiliaries – Sargazo Area)	880	Concrete Dike Shack
55-gal. Lube Oil Containers Satellite Storage Station #2 (Boilers)	825	Concrete Dike Shack & Drainage System
Lube Oil Containers Satellite Storage Station #3-4 (Machines Room)	550	Building Enclosed & Shack
55-gal. Lube Oil Containers Satellite Storage Station Gas Turbines	605	Concrete Dike Shack & Drainage System
New Power Generator Diesel Tanks (2)	1,200	Concrete Dike Shack & Drainage System
Emergency Generator Tank Fire Protection System Pump	304	Building Enclosed, Concrete Dike & Drainage System
Diesel Station Tank	800	Enclosed Shack, Concrete Dike & Drainage System
Total Aboveground Storage Capacity	**24,104,804**	

NOTE:
INSTALLATION UNDER USEPA (ENVIRONMENTAL PROTECTION AGENCY) AND USCG (COAST GUARD) JURISDICTION.



REVISIONS					REVISIONS					REFERENCE DRAWINGS		COORDINATED		
NO.	DATE	DESCRIPTION	APPD.		NO.	DATE	DESCRIPTION	APPD.		NUMBER	TITLE	DEPARTMENT	SIGNATURE	DATE
1	OCTOBER 2013	SPCC PLAN REVISION										ARCHITECTURAL		
												CIVIL		
												ELECTRICAL		
												MECHANICAL		

DESIGNED
SURVEYED
DRAWN
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

PUERTO RICO ELECTRIC POWER AUTHORITY CORPORATE SEAL

PUERTO RICO ELECTRIC POWER AUTHORITY
WATER QUALITY DEPARTMENT

PALO SECO STEAM PLANT
SITE PLAN – SPCCP

SCALE: | SAN JUAN, PUERTO RICO | November 2014

Google Maps

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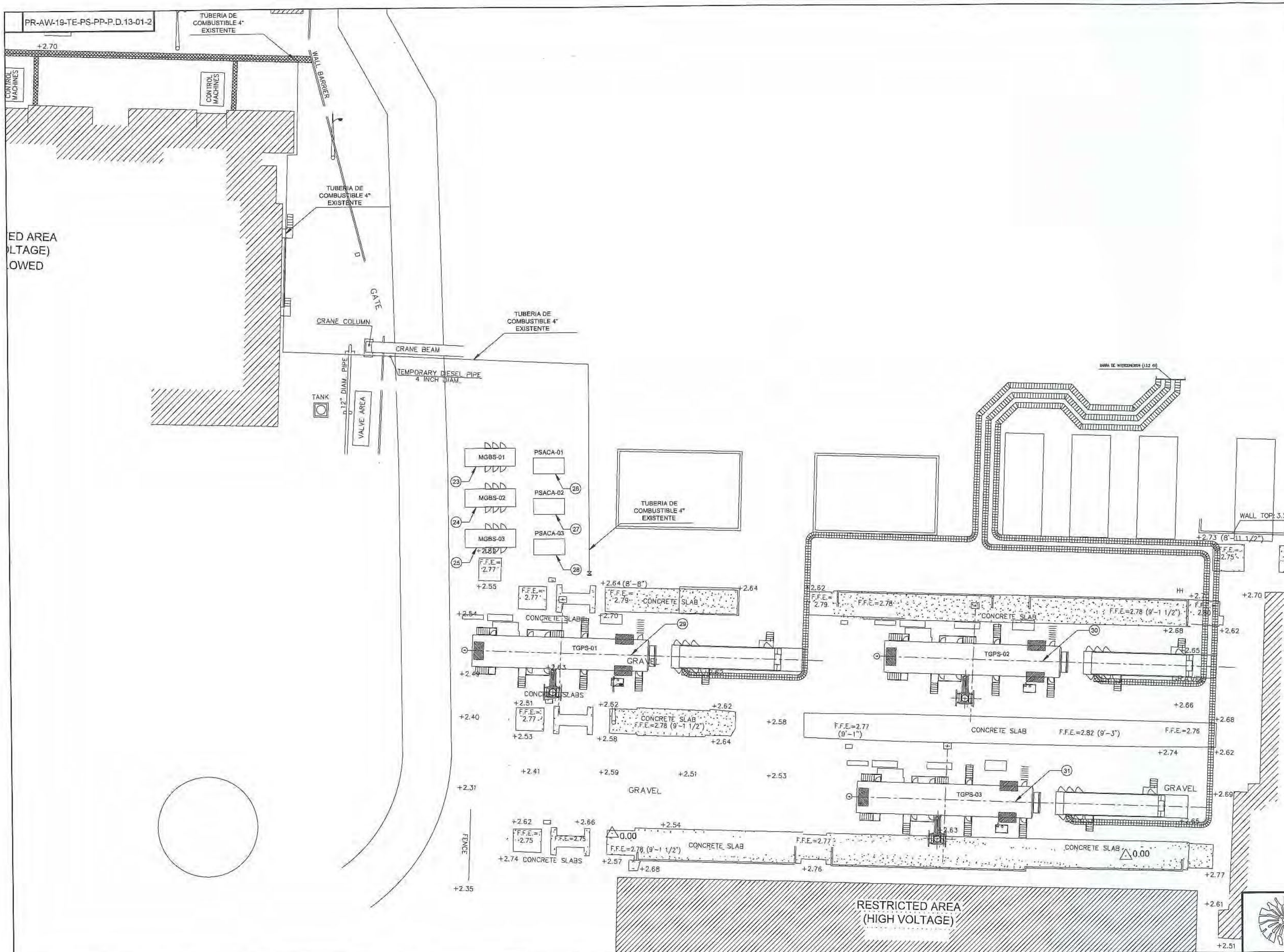
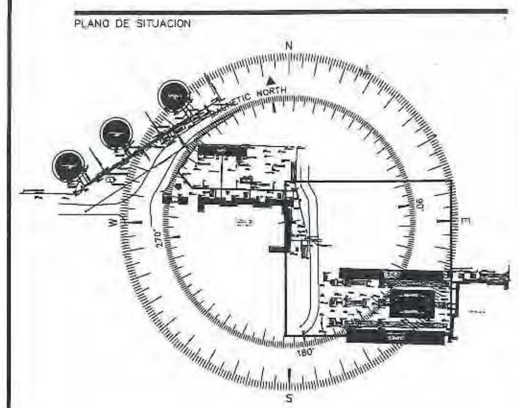
Casa
Establecer ubicación

Ubicación	
Catastro	039-000-008-04
[redacted]	
Municipio	Toa Baja (95.0%), Cataño (5.0%)
Barrio	Palo Seco (89.3%), Sabana Seca (5.7%), Palmas (5.0%)
Características Ambientales	
Zona Inundabilidad	X (57.5%), 0.2 PCT (33.2%), AE (9.1%), VE (0.2%)
Zona Inund. Advisory	AE (55.8%), A (27.3%), X 0.2% ACF (11.2%), Coastal A Zone (0.8%), VE (0.2%)
Panel Inundabilidad	72000C0336J
Floodway	
Suelo (NRCS)	Ud (82.6%), Hy (13.3%), W (4.0%), Sm (0.1%)
Calificación y Clasificación de Suelo	
Calificación	Oficialización del geodato en proceso, favor de referirse al mapa de calificación vigente.
Clasificación PT	Oficialización del geodato en proceso, favor de referirse al mapa de calificación vigente.
Clasificación PUT	SU (97%), AGUA (2%), VIAL (1%)
Mapas de Calificación	Hoja: 032 de Toa Baja, Mapa PUT, Cataño
Distrito Sobrepuesto	APE-ZC (Área de Planificación Especial Zona Cársica)
Zona Histórica	
Sitio Histórico	
Reglamento Aplicable	• Plan de Uso de Terrenos • Plan de Área 5 Frente Marítimo Toa Baja • Plan de Área 5 Frente Marítimo Toa Baja
Vigencia de Clasificación PUT	30-nov-2015
Vigencia de GeoDato de Calificación	4/10/2008
Status POT	Municipio Autónomo

(oprima para definir título)


ESTADO LIBRE ASOCIADO DE
PUERTO RICO
Junta de Planificación
[-]
(oprima para definir título)
N
0 200 400ft
JUNTA DE PLANIFICACION





LEYEND:

- EQUIPOS A INSTALAR
- TUBERIA DE COMBUSTIBLE 4" EXISTENTE
- (8'-02") GROUND LEVEL CONVERSION ENGLISH UNITS
- +2.49 GROUND LEVEL (MEAN SEA LEVEL) METERS
- △ EST-1 CONTROL STATION

LISTA DE EQUIPOS				
PTO	TAG	DESCRIPCION	NORTE	ESTE
23	MGBS-01	MOTOGENERADOR DIESEL - BLACK START 01	268815.39	230005.03
24	MGBS-02	MOTOGENERADOR DIESEL - BLACK START 02	268810.81	230005.03
25	MGBS-03	MOTOGENERADOR DIESEL - BLACK START 03	268806.23	230005.03
26	PSACA-01	Paquete de SACA 01	268814.37	230011.67
27	PSACA-02	Paquete de SACA 02	268809.79	230011.67
28	PSACA-03	Paquete de SACA 03	268805.21	230011.67
29	TGPS-01	Turbogenerador Palo Seco 01	268.793.20	230.012.88
30	TGPS-02	Turbogenerador Palo Seco 02	268.792.15	230.059.46
31	TGPS-03	Turbogenerador Palo Seco 03	268.776.32	230.056.23

GRAPHIC SCALE (METERS) 0 5 10 20 30 40 50

GRAPHIC SCALE (FEET) 0 5 10 20 30 40 50 60 70 80 90 100

Wellington Turbines LLC

PRECISION CORP. INDUSTRIAL CONTRACTORS

REVISIONS				REVISIONS				REFERENCE DRAWINGS	
NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NUMBER	TITLE

COORDINATED		
DEPARTMENT	SIGNATURE	DATE
ARCHITECTURAL		
CIVIL		
ELECTRICAL		
MECHANICAL		

DESIGNED
SURVEYED
DRAWN
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

LIC. # | DATE

PUERTO RICO ELECTRIC POWER AUTHORITY CORPORATE SEAL

PUERTO RICO ELECTRIC POWER AUTHORITY
ENGINEERING DIVISION

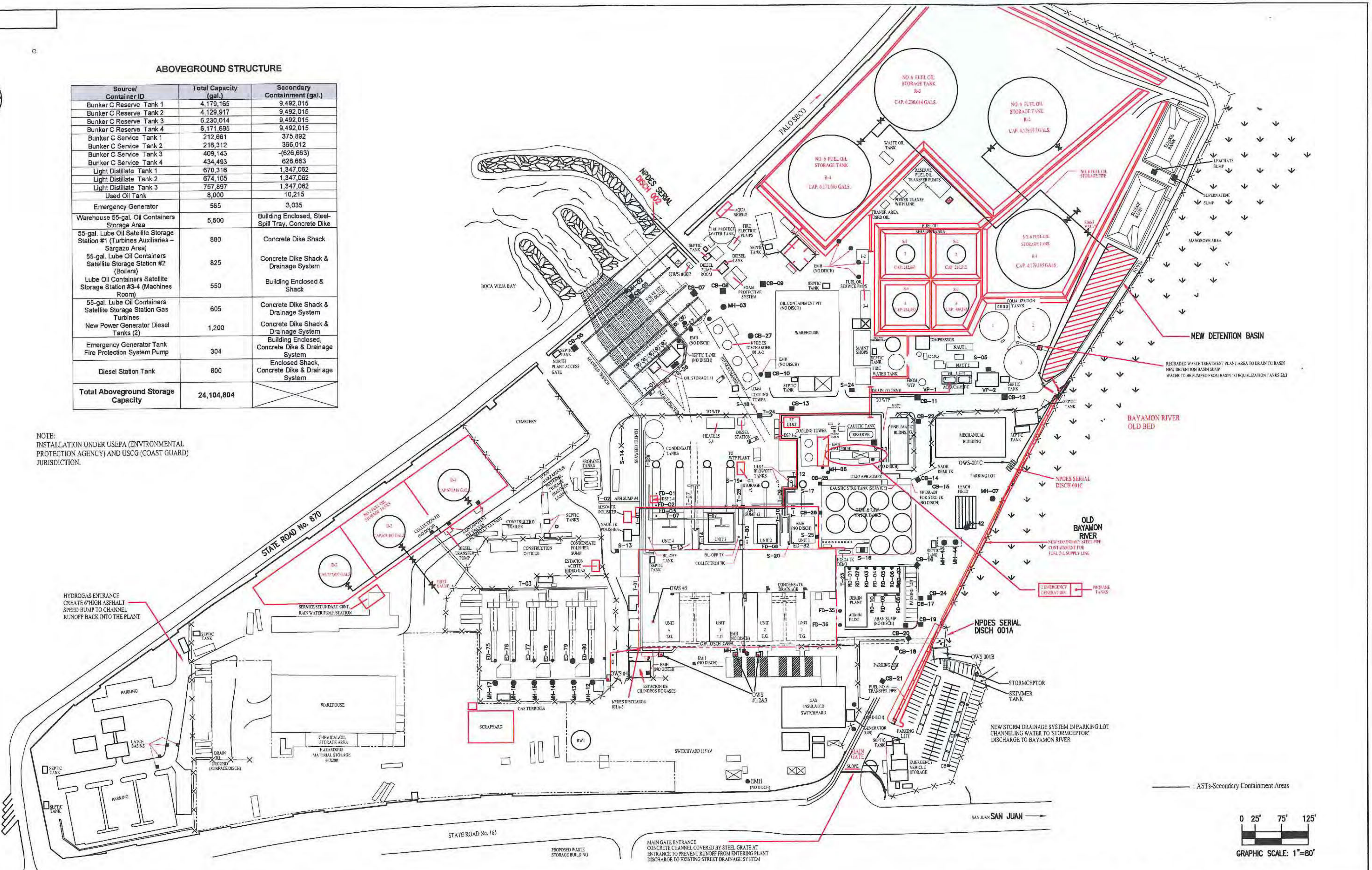
SAN JUAN, PUERTO RICO - PLANTA PALO SECO
PLOT PLANT

SCALE: 1:200 | SAN JUAN, PUERTO RICO | HOJA 02 DE 02

ABOVEGROUND STRUCTURE

Source/ Container ID	Total Capacity (gal.)	Secondary Containment (gal.)
Bunker C Reserve Tank 1	4,179,165	9,492,015
Bunker C Reserve Tank 2	4,129,917	9,492,015
Bunker C Reserve Tank 3	6,230,014	9,492,015
Bunker C Reserve Tank 4	6,171,695	9,492,015
Bunker C Service Tank 1	212,661	375,892
Bunker C Service Tank 2	216,312	366,012
Bunker C Service Tank 3	409,143	-(626,663)
Bunker C Service Tank 4	434,493	626,663
Light Distillate Tank 1	670,316	1,347,062
Light Distillate Tank 2	674,105	1,347,062
Light Distillate Tank 3	757,897	1,347,062
Used Oil Tank	8,000	10,215
Emergency Generator	565	3,035
Warehouse 55-gal. Oil Containers Storage Area	5,500	Building Enclosed, Steel-Spill Tray, Concrete Dike
55-gal. Lube Oil Satellite Storage Station #1 (Turbines Auxiliaries – Sargazo Area)	880	Concrete Dike Shack
55-gal. Lube Oil Containers Satellite Storage Station #2 (Boilers)	825	Concrete Dike Shack & Drainage System
Lube Oil Containers Satellite Storage Station #3-4 (Machines Room)	550	Building Enclosed & Shack
55-gal. Lube Oil Containers Satellite Storage Station Gas Turbines	605	Concrete Dike Shack & Drainage System
New Power Generator Diesel Tanks (2)	1,200	Concrete Dike Shack & Drainage System
Emergency Generator Tank Fire Protection System Pump	304	Building Enclosed, Concrete Dike & Drainage System
Diesel Station Tank	800	Enclosed Shack, Concrete Dike & Drainage System
Total Aboveground Storage Capacity	**24,104,804**	

NOTE:
INSTALLATION UNDER USEPA (ENVIRONMENTAL PROTECTION AGENCY) AND USCG (COAST GUARD) JURISDICTION.



REVISIONS			
NO.	DATE	DESCRIPTION	APPD.
1	OCTOBER 2013	SPCC PLAN REVISION	

REVISIONS			
NO.	DATE	DESCRIPTION	APPD.

REFERENCE DRAWINGS	
NUMBER	TITLE

COORDINATED		
DEPARTMENT	SIGNATURE	DATE
ARCHITECTURAL		
CIVIL		
ELECTRICAL		
MECHANICAL		

DESIGNED
SURVEYED
DRAWN
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

PUERTO RICO ELECTRIC POWER AUTHORITY CORPORATE SEAL

PUERTO RICO ELECTRIC POWER AUTHORITY
WATER QUALITY DEPARTMENT

PALO SECO STEAM PLANT
SITE PLAN – SPCCP

SCALE: | SAN JUAN, PUERTO RICO | November 2014

CATERPILLAR®

Caterpillar Inc.
100 N.E. Adams Street
Peoria, IL 61629 USA

GENERATOR SET (ISO 8528)

GENERATOR SET SALES DESCRIPTION		
ENGINE MODEL	C13	
GENERATOR MODEL	400	
GENERATOR SET S/N	CAT00C13ET3200383	
SALES ORDER REFERENCE	SPGZW	
DATE OF MANUFACTURE	8 2018	
DUTY	STANDBY	
RATED POWER	500 400	kVA kW

GENERATOR DATA DESCRIPTION

RATED VOLTAGE	480	V
PHASE	3	
WIRE	12	LEAD
POWER FACTOR	0.8	COS Ø
RATED FREQUENCY	60	Hz
RATED CURRENT	601	A
RATED RPM	1800	RPM
GENERATOR CONNECTION	WYE	
CONNECTION CONFIGURATION	SERIES	
INSULATION CLASS	H	
SUB-TRANSIENT REACTANCE X"d	0.1233 0.0568	PER UNIT OHMS
TRANSIENT REACTANCE X'd	0.1758 0.081	PER UNIT OHMS
SYNCHRONOUS REACTANCE	3.2682 1.506	PER UNIT OHMS
ZERO SEQUENCE REACTANCE	0.0091 0.0042	PER UNIT OHMS
EXCITATION VOLTAGE	72.9	VOLTS
EXCITATION CURRENT	3.48	AMPS
FRAME	6124D	
ALTITUDE	1,000.0	M
NEMA TEMPERATURE RISE	105	°C BY RESISTANCE
NEMA AMBIENT TEMPERATURE	40	°C

GENERATOR OVERLOAD PROTECTED BY INHERENT DESIGN

GENERATOR S/N	G6B24739
MADE IN	SEGUIN, TX, USA

FMT 2300 fulfills 118-8452

CAT®

UL LISTED
29NN
FILE AU3508

UL TEMPERATURE RISE (MAX)
135°C BY RESISTANCE

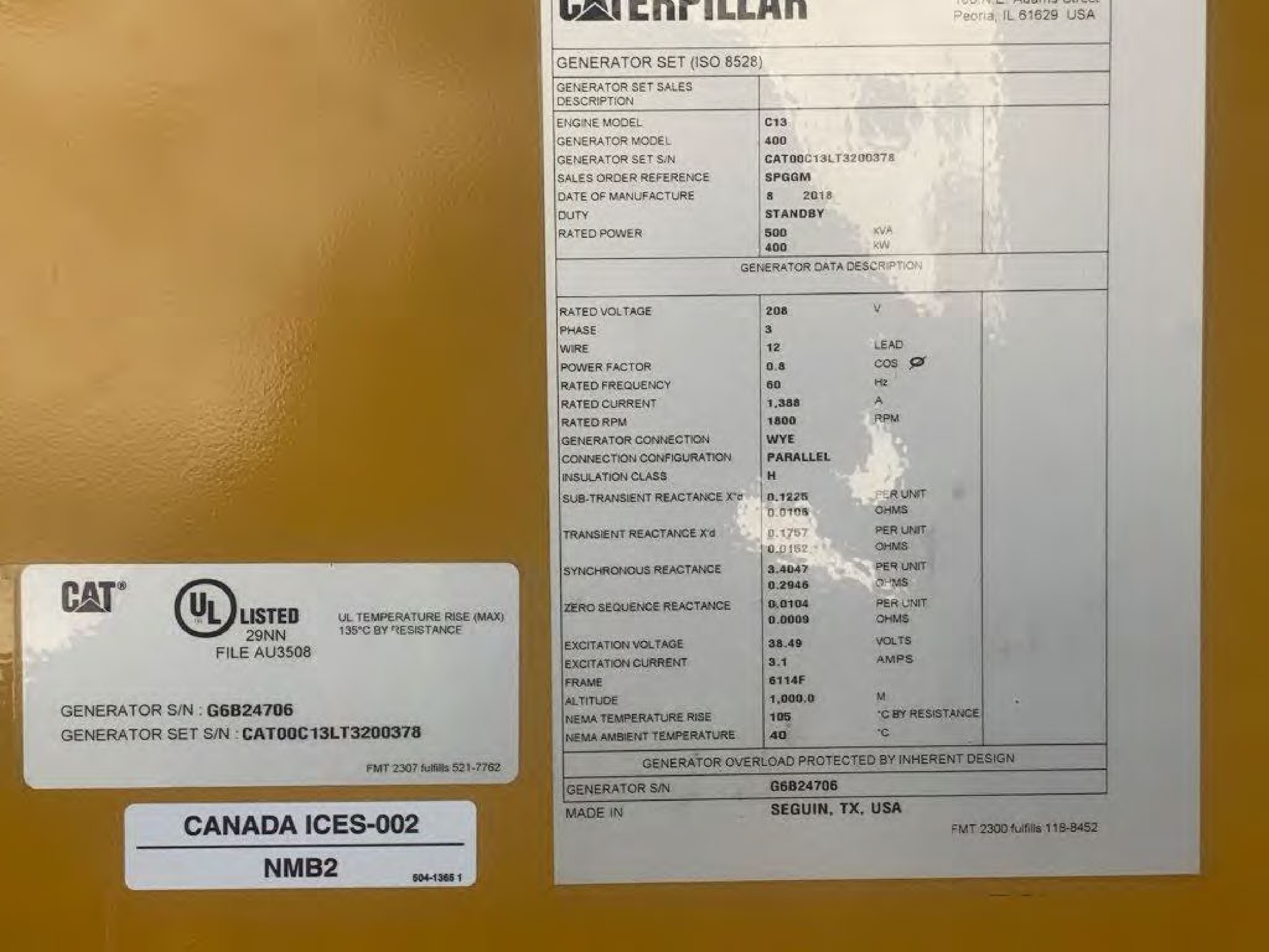
GENERATOR S/N : G6B24739
GENERATOR SET S/N : CAT00C13ET3200383

FMT 2307 fulfills 521-7762

CANADA ICES-002

NMB2

504-1365 1


CATERPILLAR
Peoria, IL 61629 USA
GENERATOR SET (ISO 8528)
GENERATOR SET SALES DESCRIPTION
ENGINE MODEL C13
GENERATOR MODEL 400
GENERATOR SET S/N CAT00C13LT3200378
SALES ORDER REFERENCE SPGGM
DATE OF MANUFACTURE 8 2018
DUTY STANDBY
RATED POWER 500 KVA 400 KW
GENERATOR DATA DESCRIPTION
RATED VOLTAGE 208 V
PHASE 3
WIRE 12 LEAD
POWER FACTOR 0.8 COS Ø
RATED FREQUENCY 60 Hz
RATED CURRENT 1,388 A
RATED RPM 1800 RPM
GENERATOR CONNECTION WYE
CONNECTION CONFIGURATION PARALLEL
INSULATION CLASS H
SUB-TRANSIENT REACTANCE X"d 0.1225 PER UNIT 0.0106 OHMS
TRANSIENT REACTANCE X'd 0.1757 PER UNIT 0.0162 OHMS
SYNCHRONOUS REACTANCE 3.4047 PER UNIT 0.2946 OHMS
ZERO SEQUENCE REACTANCE 0.0104 PER UNIT 0.0009 OHMS
EXCITATION VOLTAGE 38.49 VOLTS
EXCITATION CURRENT 3.1 AMPS
FRAME 6114F
ALTITUDE 1,000.0 M
NEMA TEMPERATURE RISE 105 °C BY RESISTANCE
NEMA AMBIENT TEMPERATURE 40 °C
GENERATOR OVERLOAD PROTECTED BY INHERENT DESIGN
GENERATOR S/N G6B24706
MADE IN SEGUIN, TX, USA
FMT 2300 fulfills 118-8452
CAT
UL LISTED
29NN
FILE AU3508
UL TEMPERATURE RISE (MAX) 135°C BY RESISTANCE
GENERATOR S/N : G6B24706
GENERATOR SET S/N : CAT00C13LT3200378
FMT 2307 fulfills 521-7762
CANADA ICES-002
NMB2
504-1365 1

CAT®

UL LISTED
29NN
FILE AU3508

UL TEMPERATURE RISE (MAX)
135°C BY RESISTANCE

GENERATOR S/N : G6B25535

GENERATOR SET S/N : CAT00C13JT3200682

FMT 2307 fulfills 521-7762

CANADA ICES-002

NMB2

504-1365 1

CATERPILLAR®

Caterpillar Inc.
100 N.E. Adams Street
Peoria, IL 61629 USA

GENERATOR SET (ISO 8528)

GENERATOR SET SALES DESCRIPTION		
ENGINE MODEL	C13	
GENERATOR MODEL	400	
GENERATOR SET S/N	CAT00C13JT3200682	
SALES ORDER REFERENCE	SXJNZ	
DATE OF MANUFACTURE	9 2019	
DUTY	STANDBY	
RATED POWER	500	kVA
	400	kW

GENERATOR DATA DESCRIPTION

RATED VOLTAGE	208	V
PHASE	3	
WIRE	12	LEAD
POWER FACTOR	0.8	COS Ø
RATED FREQUENCY	60	Hz
RATED CURRENT	1,388	A
RATED RPM	1800	RPM
GENERATOR CONNECTION	WYE	
CONNECTION CONFIGURATION	PARALLEL	
INSULATION CLASS	H	
SUB-TRANSIENT REACTANCE X"d	0.1225	PER UNIT
	0.0106	OHMS
TRANSIENT REACTANCE X'd	0.1757	PER UNIT
	0.0152	OHMS
SYNCHRONOUS REACTANCE	3.4047	PER UNIT
	0.2946	OHMS
ZERO SEQUENCE REACTANCE	0.0104	PER UNIT
	0.0009	OHMS
EXCITATION VOLTAGE	38.49	VOLTS
EXCITATION CURRENT	3.1	AMPS
FRAME	6114F	
ALTITUDE	1,000.0	M
NEMA TEMPERATURE RISE	105	°C BY RESISTANCE
NEMA AMBIENT TEMPERATURE	40	°C

GENERATOR OVERLOAD PROTECTED BY INHERENT DESIGN

GENERATOR S/N	G6B25535
MADE IN	SEGUIN, TX, USA

FMT 2300 fulfills 118-8452


ENGINE MODEL
C13
SERIAL NUMBER
PW300535
CATERPILLAR®
CAT®
ARRANGEMENT NUMBER
506-6872
MADE IN USA
OF DOMESTIC AND FOREIGN COMPONENTS
3N-3790 18


NGINE
MODEL
C13
SERIAL
NUMBER
PW300530
CATERPILLAR®
CAT®
ARRANGEMENT
NUMBER
506-6872
ADE IN USA
DOMESTIC AND FOREIGN COMPONENTS
3N-3790 18


ENGINE MODEL
C13
SERIAL NUMBER
PW300837
CATERPILLAR® CAT®
ARRANGEMENT NUMBER
506-6872
MADE IN USA
OF DOMESTIC AND FOREIGN COMPONENTS
3N-3790 18

Anejo A-3(b)

[*Presentado sellado*]