

Linero, Alvaro

From: Linero, Alvaro
Sent: Friday, March 20, 2009 11:51 AM
To: 'Osbourn, Scott'; Heron, Teresa
Cc: Lorne, Jacquelyn; Hathaway, Richard; Santilli, Dave; Gnecco, John
Subject: RE: RBEC -- VOC cap
Attachments: Emission Evaluation to DEP MPS.pdf

Scott:

As we discussed, I sent a RAI regarding Riviera a few days ago.

I don't think a facility-wide VOC cap is the way to go.

Record keeping is cumbersome and not at all accurate measure of VOC.

If we rely on continuous monitoring then we need to include starts, malfunctions, stops but would have no such info about these events from existing units.

Consider these possibilities:

Ask Mitsubishi if their VOC guarantee is really a VOC guarantee or actually a total hydrocarbon (THC) or unburnt hydrocarbon (UHC) guarantee. Then VOC will be less than is being assumed here.

Note that VOC should not include methane and ethane.

See attached evaluation from Mitsubishi. I think John Gnecco might have this, but I can't guarantee he does. I obtained it from either FPL or Mitsubishi and would prefer if FPL relies on documents from its own files if they go back to Mitsubishi about this.

But note that (according to Mitsubishi) as long as CO is kept to less than 10 ppm, then VOC is expected to be less than 1 ppm. They felt safe for purposes of guarantees setting it a 6 ppmvd @15% O2. Again, even here I'm not sure they mean VOC excluding the methane.

The Mitsubishi G class is a very high temperature unit. I am looking at data from Turkey Pt Unit 5 showing measured THC emissions (conservative measure of VOC) at < 0.2 ppm while burning fuel oil when the limit is 2.8 ppm. So if the THC is that low from an F-Frame unit, then the VOC from a G-unit will be even lower.

Maybe Mitsubishi (or FPL) would agree to 5 ppm.

Can reconfirm when W. County starts up.

Could alternatively limit oil firing to 850 hours per year per unit averaged over the three units and just keep the 6 and no cap.

I'll do a pre-draft and send for your consideration.

Thanks.

Al.

4/16/2009

Emission Evaluation of M501G1 to DEP

1. NOx and CO achievement to guaranteed level on gas firing

The guaranteed NOx and CO emission levels on gas firing for WCEC project are shown on Table-1.

	Unit	GT Load Range	Guaranteed Value
NOx	ppmvd @ 15%O ₂	60-100%	15
CO	ppmvd @ 15%O ₂	60-90%	10
		90-100%	4.1

Table-1: Guaranteed NOx and CO on gas firing

The Dry Low NOx combustor applied to this PJ has operating experiences at the actual machine of T-point verification plant located in Takasago Machinery Works. Actual measured NOx and CO emissions are shown on Fig-1 compared with the expected value for this PJ.

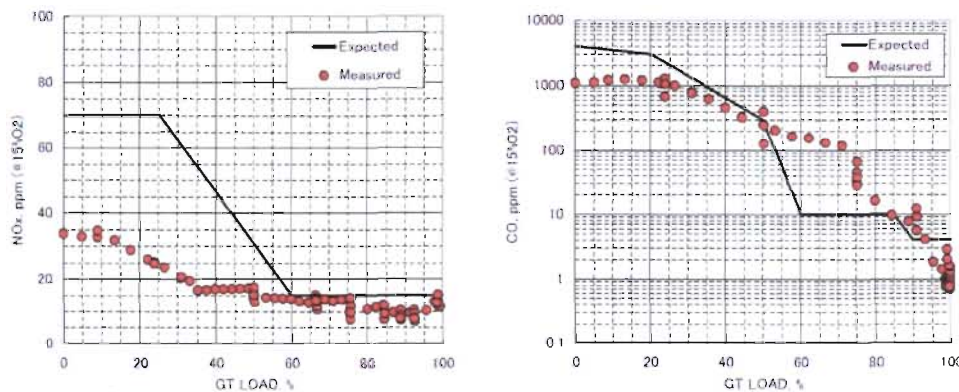


Fig-1: Measured NOx and CO at T-Point

As shown on Fig-1, measured NOx emission is in line with the expected value, but CO emission exceeds the expected values between 50% and 90% load because operating settings optimization was not required during this load range for the T-point.

In order to achieve the expected CO emissions between 50% and 90% load, firing temperature have to be increased by changing IGV opening settings as follows;

- (1) IGV setting is changed towards closed position at each load between 50% and 90% load
- (2) Firing temperature is increased by reducing inlet air flow with IGV more closed
- (3) CO emission can be decreased by firing temperature increase.

CO emission value to each firing temperature have been already measured and confirmed in actual operating experiences as shown on Fig-2.

Therefore, CO emission can be achieved to the expected values by means of firing temperature increase above 1,400 deg.C with IGV setting optimization between 50% and 90% load as shown on Fig-3. NOx emission during part load can be still kept to the range not exceeding the expected values by pilot fuel ratio adjustment, although the firing temperature increases.

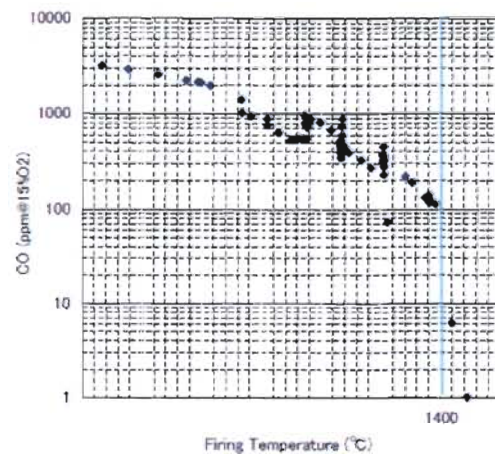


Fig-2: Measured CO vs. Firing Temperature

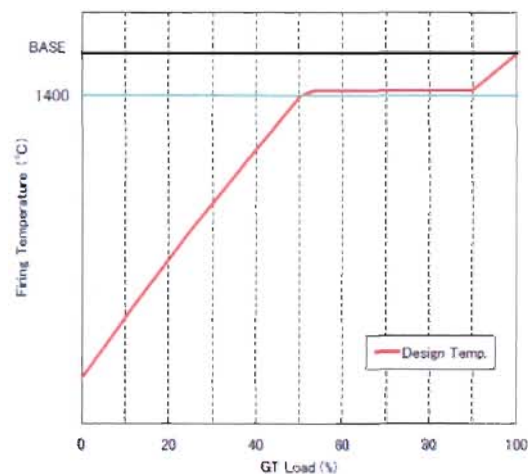


Fig-3: GT Load vs. Firing Temperature

2. Relationship among CO, VOC and Formaldehyde on oil firing

The guaranteed CO, VOC and Formaldehyde emission levels on oil firing above 90% of GT load for WCEC project are shown on Table-2.

	Unit	GT Load Range	Guaranteed Value
CO	ppmvd @ 15%O ₂	90-100%	8.0
VOC	ppmvd @ 15%O ₂	90-100%	6.0
Formaldehyde	ppbvd @ 15%O ₂	90-100%	91

Table-2: Guaranteed CO, VOC and Formaldehyde on oil firing

We have studied relationship among CO, VOC and formaldehyde on oil firing from combustor rig test result. According to this test result, the following is our observation.

- VOC will be less than 1ppmvd in case that CO emission is 10ppmvd or below as shown on Fig.-4.
- Formaldehyde will be less than 91ppbvd in case that CO emission is 10ppmvd or below as shown on Fig.-5.

Therefore, we are confident to achieve the above guaranteed values, however, above is the figures to be guaranteed taking into consideration of measurement uncertainty, etc.

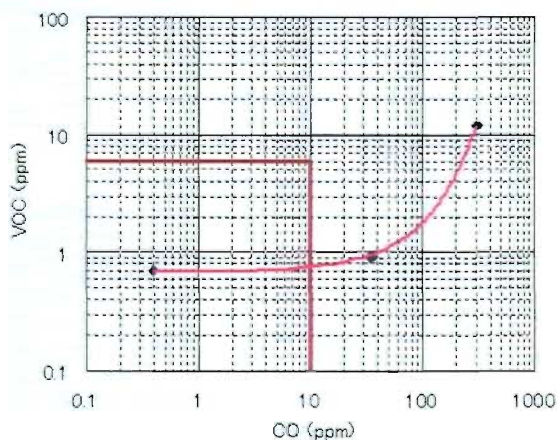


Fig.-4: CO vs. VOC on oil firing at Rig Test

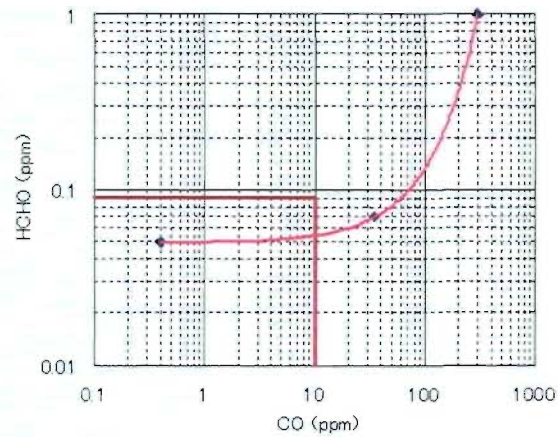
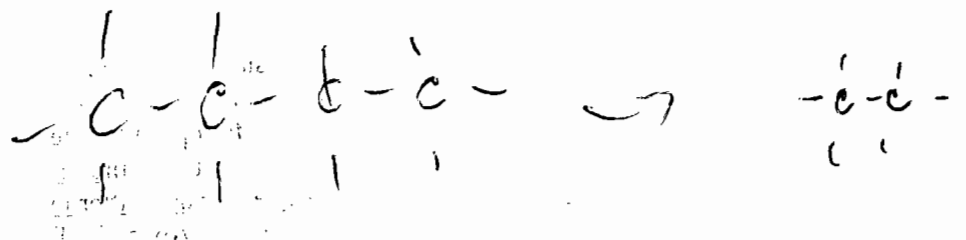
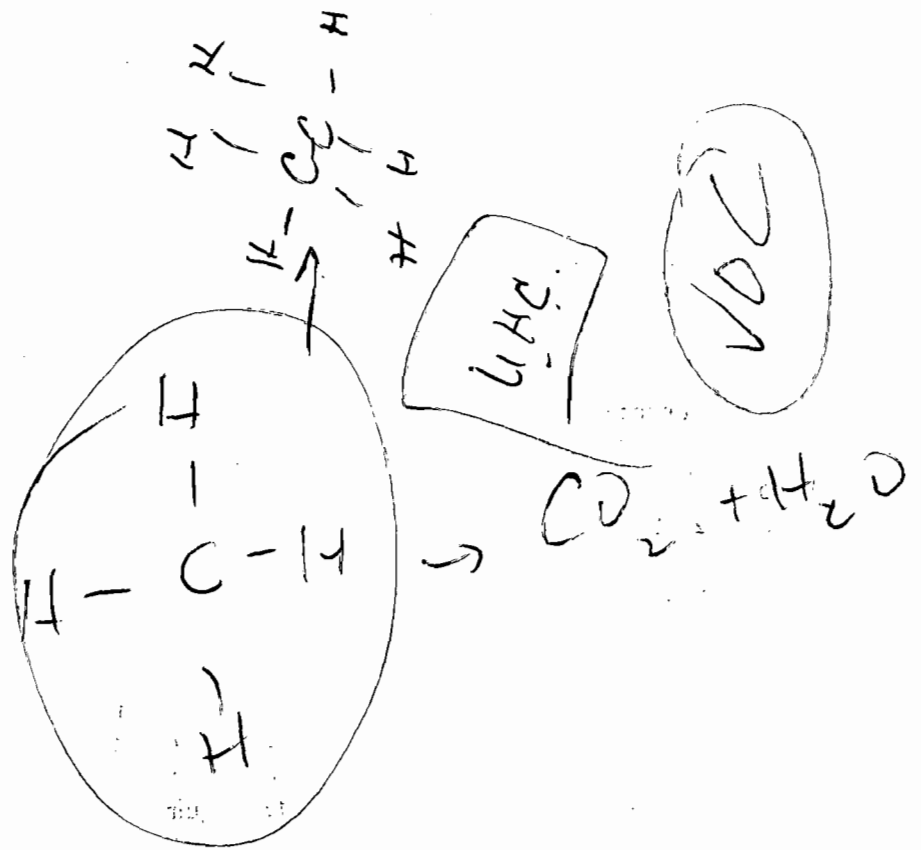


Fig.-5: CO vs. Formaldehyde on oil firing at Rig Test





FPL

April 2, 2009

A.A. Linero, P.E.
Department of Environmental Protection
Bureau of Air Regulation
111 South Magnolia St.
Tallahassee, FL 32399

RECEIVED

APR 03 2009

BUREAU OF AIR REGULATION

**Re: Florida Power & Light Company
Cape Canaveral Energy Center Project
DEP File No. 0090006-005-AC**

Dear Mr. Linero:

Florida Power & Light Company (FPL) is in receipt of the Draft Air Construction Permit and Technical Evaluation and Preliminary Determination (TEPD) for the Cape Canaveral Energy Center Project, issued by the Department on March 13, 2009. In accordance with the Department's Written Notice of Intent to Issue Air Permit in the above referenced file, this letter and attachments constitute FPL's written comments on the Draft Air Construction Permit, TEPD, and Appendices. These comments address several clarifications and corrections that FPL would request be considered by the Department.

Thank you for the time and care you have taken in your review of the Cape Canaveral Energy Center Project. If you have any comments or questions regarding the attached, please feel free to contact me at (561) 691-7518.

Sincerely,

A handwritten signature in cursive script that reads "Barbara P. Linkiewicz".

Barbara P. Linkiewicz
Director of Environmental Licensing

cc: Michael Halpin, DEP Siting Office
Scott Osbourn, Golder Associates
Peter Cunningham, HGS

Florida Power & Light Company

700 Universe Blvd

Juno Beach, FL 33408

**Florida Power & Light Company
Cape Canaveral Energy Center Project
DEP File No. 0090006-005-AC**

Comment Letter

Air Construction Permit

1. Section I, page 2, Facility Description, 3rd bullet: Revise as follows—“Three ~~nominal 428~~ 460 million Btu per hour...”
2. Section I, page 2, Facility Description, 3rd paragraph: Revise as follows—“Unit 3 will use ultra low-sulfur ~~diesel distillate~~ (ULSD) fuel oil as backup fuel. Unit 3 will rely on some of the existing infrastructure including ~~the cooling water system and~~ one of the fuel oil storage tanks.”
3. Section I, page 2, New Emission Units, ID No. 010: Revise as follows—“Two nominal 10-mmBtu/hr natural gas-fired process heaters (one is a spare).”
4. Section II, page 5, Condition No. 8: Revise as follows—“... and dismantled before ~~December 31,~~ 2010 December 31, 2011.”
5. Section III.A, page 8, Condition 2: Please delete the permitting note, as it is included in the Technical Evaluation document and has no bearing on this permit condition.
6. Section III.A, page 8, Condition 3: Revised as follows—“...having a ~~nominal~~ maximum heat input rate of 460 mmBtu/hr (LHV).”
7. Section III.A, page 9, Condition 5: Revise the heat input rating while firing natural gas to reflect the agreed-upon 7.5 percent increase, as follows—“The maximum heat input rate to each CTG is ~~2,490~~ 2,586 mmBtu/hr when firing natural gas and...”
8. Section III.A, page 9, Condition 6: Revise the permitted capacity as follows—“The ~~total nominal~~ maximum heat input rate to the DB for each HRSG...”
9. Section III.A, page 10, Condition 10, footnote d: Please clarify what is meant by “basic DB mode”.
10. Section III.A, page 12, Condition 17: Revise as follows—“... the permittee shall provide the Compliance Authority with an advance notice of at least 7 3 days...” If this revision is not acceptable to the Department, then FPL requests clarification on the phrase “maintenance to a combustor” as used in the condition.
11. Section III.A, page 13, Condition 20: FPL appreciates the Department’s efforts in collaboration and drafting of permit language to provide testing schedule relief in the event that the Siemens H technology is selected. Apparently, U.S. EPA Region IV has found this proposed language to be unacceptable. In light of the EPA’s comments, FPL has re-evaluated the nature and extent of this request and has determined that one of the exemptions provided under the NSPS Subpart KKKK, specifically 40 CFR 60.4310(b), is an appropriate description of the testing that will occur upon startup. A summary of the exemption language is provided below.

§ 60.4310 What types of operations are exempt from these standards of performance?

- (a) Emergency combustion turbines, as defined in §60.4420(i), are exempt from the nitrogen oxides (NO_x) emission limits in §60.4320.
- (b) Stationary combustion turbines engaged by manufacturers in research and development of equipment for both combustion turbine emission control techniques and combustion turbine efficiency improvements are exempt from the NO_x emission limits in §60.4320 on a case-by-case basis as determined by the Administrator.
- (c) Stationary combustion turbines at integrated gasification combined cycle electric utility steam generating units that are subject to subpart Da of this part are exempt from this subpart.
- (d) Combustion turbine test cells/stands are exempt from this subpart.

The proposed model turbine would be the first Siemens H turbine designed and manufactured for 60Hz operation. During commissioning of the Siemens H CTs for the Project, the first CT in the 3-on-1 configuration will undergo comprehensive commissioning and validation tests using a separate exhaust stack. Siemens has conducted extensive in-house testing, however, this effort would represent the initial field testing effort for this model of CT. As such, this effort meets the intent of the exemption provided in Section 60.4310(b) above, related to research and development of equipment. This research and development effort on the first gas turbine in service would provide for an initial test period of up to three months. This first gas turbine will then be shut down for a month, undergo an inspection outage, and then may receive some new combustion components to be prepared for combined cycle operation. The entire 3-on-1 block will then go into normal startup activities that will be on the order of up to 180 days. Therefore, the maximum research and development exemption period required is three months, which would be in addition to normal start-up activities. Following testing, a short outage would occur for inspection and removal of the temporary stack, installation of the HRSG transition duct, then resumption of normal commissioning tests.

- 12. Section III.D, page 21, Condition 6: As the applicable NSPS Subpart JJJJ does not regulate opacity, a standard of 20 percent was proposed by FPL. It is requested that the limit of 10 percent in the current draft permit be revised to the 20 percent value originally requested.
- 13. Section III.D, page 21, Condition 8: NSPS Subpart JJJJ (40 CFR 60.4243) allows for compliance with applicable emission limits to be demonstrated by manufacturer certification. FPL requests that this permit condition allow for the use of a manufacturer certification in lieu of compliance testing for the natural gas-fired compressor units. Alternatively, if the Department requires testing, FPL requests that one of the seven units be selected for testing as representative of all of the units.
- 14. Section III.E, page 23, Condition 5: FPL requests that this condition be revised to clarify that a manufacturer's certification may be used in lieu of stack testing to demonstrate compliance with the applicable permits, per NSPS Subpart IIII, 40 CFR 60.4211, which are as stringent as BACT values. limits.
- 15. Section III.E, page 23, Condition 6: Revise as follows—"Each ~~natural gas compressor~~ liquid-fueled emergency generator..."

Section III.E, page 23, Condition 7: Revise as follows—"The permittee shall maintain records of the amount of natural gas used in the ~~process heaters~~ emergency generators..."

Technical Evaluation and Preliminary Determination

16. TEPD, Page TE-2: Revise as follows—“... and then dismantled by ~~April 1, 2010~~ December 31, 2011”
17. TEPD, Page TE-4, Table 1: For Gas, the heat input rate (LHV) is ~~2,406~~ 2,586 mmBtu/hr; for Oil, heat input rate (LHV) is ~~2,268~~ 2,440 mmBtu/hr.
18. TEPD, Page TE-7, Table 4: Revise as follows:

Table 4. Applicant's Summary of Net Emissions Changes and PSD Applicability for the FPL CCEC Project

Pollutant	CCP Baseline Actual Emissions TPY	CCP Potential Emissions TPY	Net Increases (Decreases) TPY	PSD SER TPY	PSD?
Sulfur Dioxide (SO ₂)	11,140	203 210	(10,937) (10,930)	40	No
Particulate Matter (PM/PM ₁₀)	918/918	189/189	(729)/(729)	25/15	No
Nitrogen Dioxide (NO ₂)	7,725	506	(7,219) (7,220)	40	No
Carbon Monoxide (CO)	703	533	(170)	100	No
Volatile Organic Compounds (VOC)	68.4	103.8	35.4	40	No
Sulfuric Acid Mist (SAM)	495	41 42	(454) (453)	7	No
Lead (Pb)	0.11	0.05	(0.06)	0.6	No
HAP	>25	<20	(≥5)	NA	NA

19. TEPD, Page TE-12, under Table 5: “FPL obtained high load (90-100%) ~~guarantees-~~ performance specifications of ...”

Appendices

20. Section IV, Appendix SC, page SC-3, Condition 20: Revise as follows—“... by ~~March 1st~~ April 1st...”

Linero, Alvaro

From: Linero, Alvaro
Sent: Wednesday, July 01, 2009 3:18 PM
To: Vielhauer, Trina
Subject: RE: H Technology

Scott Osbourn and I see the matter the same way – they don't get a benefit from the H condition, especially with the CEMS condition as written.

But he needs to work it into the team for their (hopefully) concurrence.

That was a good catch on your part!

I recommend we can wait a few days before issuing our final decision on this one.

I see Ronni closed out file.

She certainly is on top of her cases.

From: Linero, Alvaro
Sent: Tuesday, June 30, 2009 4:18 PM
To: Vielhauer, Trina
Subject: RE: H Technology

They are presently considering whether they still need the consideration for the first H turbine at all. I'll let you know what I hear back. But if they believe they still need it, would the following change to the CEMS language cure the issue you mentioned? They would still have to test for purposes of EPA at 60 or 180 mark. I could add the footnote about not exempting them from the EPA test requirements.

Any other thoughts?

- a. *CO Monitors:* The CO monitors shall be certified pursuant to 40 CFR 60, Appendix B, Performance Specification 4 or 4A within 60 calendar days of achieving permitted capacity as defined in Rule 62-297.310(2), F.A.C., but no later than 180 calendar days after initial startup. If "H" technology CTG are utilized, the described certification shall be performed on the CEMS associated with the first installed CTG within 180 calendar days of achieving permitted capacity, but no later than 300 calendar days after initial startup. Quality assurance procedures shall conform to the requirements of 40 CFR 60, Appendix F, and the Data Assessment Report in Section 7 shall be made each calendar quarter, and reported semiannually to the Compliance Authority. The RATA tests required for the CO monitor shall be performed using EPA Method 10 in Appendix A of 40 CFR 60 and shall be based on a continuous sampling train. The CO monitor span values shall be set appropriately considering the allowable methods of operation and corresponding emission standards.

Linero, Alvaro

From: Linero, Alvaro
Sent: Tuesday, June 23, 2009 10:32 AM
To: 'Lorne, Jacquelyn'; 'sosbourn@golder.com'; 'Hathaway, Richard'; Santilli, Dave
Cc: Vielhauer, Trina
Subject: RE: Cape Canaveral

O.k. Scott:

Further to our teleconference this morning

We will put the same language in Canaveral final permit (as with Riviera) with regards to data exclusion during installation of CO catalyst.

This communication documents that you made such a request.

We'll let the time expire on your extension request and send you final permit the following day.

So final permit will look like prelim version that we sent for your review plus the exclusion language.

Thank you.

Al Linero.

From: Linero, Alvaro
Sent: Tuesday, June 23, 2009 8:35 AM
To: 'Lorne, Jacquelyn'; 'sosbourn@golder.com'; 'Hathaway, Richard'
Subject: Cape Canaveral

Hi Scott:

I called you this a.m.

Is FPL leaning towards receiving a final permit after extension runs out (or after withdrawing it based on prelim version of final permit).

Or.

Are they thinking they prefer a new draft for public notice that we can re-issue this week?

Thanks.

Al Linero.

Linero, Alvaro

From: Osbourn, Scott [Scott_Osbourn@golder.com]
Sent: Thursday, June 18, 2009 5:35 PM
To: Linero, Alvaro
Subject: FW: Prelim of final air permit for CCEC

Importance: High

We've had some additional calls with FPL this week and would like to request a resolution of 2 issues. The first is a request to insert the same language in the CCEC permit that was acceptable for Condition 24.e of the RBEC permit, allowing for the exclusion of CO data in the event an oxidation catalyst is required. The CCEC permit could be revised with a similar Condition 24.e for consistency between the 2 facilities. Secondly, we'd like to pursue an approach that would allow for the additional 4,000 hrs of operation for both the aux boiler and the temporary boiler. We understand that the Department is saying that such an increase in hours would require a new public notice and comment period. If that's the case, it would make sense to do that now and save both us and the Department the time and effort that would be required to finalize this permit and then again apply for the requested changes, resulting in the issuance of yet another draft and final permit.

I'll be working from home tomorrow, but can be reached by cell at (727) 278-3358. Please let me know if the above suggestions would be cause for any concern on your part.

Scott Osbourn (P.E.) | Associate and Senior Consultant | Golder Associates Inc.
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T: +1 (813) 287-1717 | **D:** +1 (813) 769-5304 | **F:** +1 (813) 287-1716 | **C:** +1 (727) 278-3358 | **E:**
Scott_Osbourn@golder.com | www.golder.com

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Please consider the environment before printing this email.

From: Lorne, Jacquelyn [mailto:Jacquelyn.Lorne@fpl.com]
Sent: Monday, June 15, 2009 10:19 AM
To: Hathaway, Richard; Osbourn, Scott
Cc: McCann, Bob; Merrill, Rich; Santilli, Dave; Pinnock, Ashley; 'pcunningham@hgslaw.com'; Herron, Christopher
Subject: Prelim of final air permit for CCEC
Importance: High

Rick and Scott,

Attached please find the prelim version of the final air permit for CCEC. Please review and let me know if you have an outstanding issue that needs further discussion with DEP. If no outstanding issues remain, please advise. I told Al I would get back with him tomorrow.

Jackie

From: Linero, Alvaro [mailto:Alvaro.Linero@dep.state.fl.us]
Sent: Monday, June 15, 2009 10:15 AM
To: Lorne, Jacquelyn
Subject: RE: Good time to call?

As we discussed.

From: Lorne, Jacquelyn [mailto:Jacquelyn.Lorne@fpl.com]
Sent: Monday, June 15, 2009 9:57 AM
To: Linero, Alvaro
Subject: RE: Good time to call?

Al,

I am in the office now if you want to call. I like the approach you outlined below (steps 1-3).

Thanks,

Jackie

From: Linero, Alvaro [mailto:Alvaro.Linero@dep.state.fl.us]
Sent: Monday, June 15, 2009 9:56 AM
To: Lorne, Jacquelyn
Subject: Good time to call?

Jackie:

When can I call you to give you update on finalization of Cape Canaveral Permit?

I'm thinking we would send Randy (and you) a prelim copy rather than running it through your legal people). You could have it reviewed and then decide if you want to:

1. Just let the time run out on your petition extension, after we would just issue as final.
2. Submit a withdrawal request for that petition extension on basis of acceptance of the prelim copy that I will send you.
3. Request a meeting if you want to discuss further.

Thanks.

Al Linero.

The Department of Environmental Protection values your feedback as a customer. DEP Secretary Michael W. Sole is committed to continuously assessing and improving the level and quality of services provided to you. Please take a few minutes to comment on the quality of service you received. Simply click on [this link to the DEP Customer Survey](#). Thank you in advance for completing the survey.