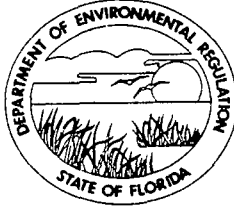


STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301



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SECRETARY

January 20, 1983

Mr. Claude W. Hiers, P.E.
Superintendent of Industrial
Engineering
City of Lakeland
Department of Electric and
Water Utilities
1000 East Parker Street
Lakeland, Florida 33801

Dear Mr. Hiers:

RE: C.D. McIntosh Jr. Power Plant
Units 1 and 2 Fuel Conversion
Air Pollutant Emission Limits

In your letters of August 31, and November 16, 1982, you requested that I provide you with guidance on the applicable air quality regulatory requirements for a number of possible coal conversion scenarios for the McIntosh Power Plant located in Lakeland, Florida.

Following receipt of your August letter, I talked with your consultant, Doug Fulle of EnviroSphere Company. Since then, I have discussed your questions with Tom Devine and Roger Pfaff of EPA's Atlanta regional office and with members of my staff. Based on the information provided in your letters and the additional information developed as a result of these discussions, I believe I can now provide you with useful answers to your questions.

In your August letter you described the McIntosh Plant as follows:

"Unit 1 at C.D. McIntosh is rated at 95MW and currently burns 2.2% S oil. Permitted emission rates are 2.75 lbs/mmBtu for SO₂ and 0.1 lbs/mmBtu for particulates. Construction on it was commenced on 10/15/68 and it went into commercial operation on 9/19/70. It is not subject to NSPS.

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Unit 2 is rated at 115 MW and currently burns 0.8% S oil. Permitted emission rates are 0.8 lbs/mmBtu for SO₂, 0.1 lbs/mmBtu for particulates, and 0.3 lbs/mmBtu for NO_x. Construction on it was commenced on 8/23/73 and it went into commercial operation on 1/23/76. Unit 2 is subject to the Subpart D (1971) NSPS.

Unit 3 is rated at 364 MW, can fire coal, processed refuse, oil, and various combinations of these fuels. It is just now going into commercial operation, is subject to the Subpart Da (1979) NSPS and to emission limits established under the BACT rules of the PSD regulations.

Neither Unit 1 nor Unit 2 was originally designed to fire coal as an alternate fuel. The McIntosh Plant is located on the north shore of Lake Parker in Polk County in an area which is attainment for all criteria pollutants."

For convenience, I will repeat your questions in the order in which you presented them.

1. "If the Department of Energy (DOE) issues a fuel conversion order involving direct coal firing to the City of Lakeland under the Fuel Use Act, it is expected that PSD would be avoided for both Units 1 and 2. It is also expected that the Subpart D (1971) NSPS for coal would apply to Unit 2, but not to Unit 1. What emission limits would apply to Unit 1?"

For the set of facts you have described, formal PSD review requirements would be avoided for both Units 1 and 2. However, any increase in emissions that would result from the conversion of either or both of the units would be constrained by the particulate and sulfur dioxide PSD increments and the state ambient air quality standards.

Your presumption that the Subpart D (1971) NSPS would apply to Unit 2 is correct, with the caveat that the department's fuel conversion rule, which I will address below, might also apply to Unit 2 and might, but most likely would not, require emission limits more stringent than those of the Subpart D (1971) NSPS.

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The effect of a DOE conversion order is to keep an eligible unit from becoming subject to the NSPS limits and having to undergo a formal PSD review, thus leaving it to the state to establish an appropriate set of emission limits for the converted unit. However, if a unit is now subject to the Subpart D (1971) NSPS oil limits, a DOE order will not exempt that unit from complying with the Subpart D (1971) NSPS coal limits upon its conversion.

Under Florida's basic air permitting rules, the conversion of either an NSPS unit such as Unit 2 or a non-NSPS unit such as Unit 1 would be a modification to an existing major facility and would require a state construction permit prior to beginning any on-site work to convert the unit.

In order to clarify how the department would determine the appropriate emission limits and other permit conditions for the conversion of a non-NSPS unit such as Unit 1, the department has proposed the adoption of a fuel conversion rule. We expect to discuss the first draft of this proposed rule at a public workshop later this winter or early next spring. Although we have not yet drafted this proposal, I can give you a general idea of what we think the rule should require by using the Tampa Electric Company (TECO) Gannon conversion as an example.

When TECO proposed to convert four of their Gannon units back to coal, we asked them to do it in such a manner that there would be no increase in either the actual or the allowable particulate and sulfur dioxide emissions from the power station taken as a whole; and, in such a manner that there would be no significant increases in the ambient impacts of those emissions after conversion. They determined that those conditions could be met by retrofitting each converted unit with a high efficiency electrostatic precipitator (ESP) and by using washed low-sulfur coal from a domestic mine they own and control.

We think that the set of specific emission limits for each converted unit will need to be established on a case-by-case basis. For planning purposes, however, you can assume that, as a minimum, it is very unlikely that the department would allow particulate or sulfur dioxide emissions after conversion in excess of that required by the current oil-SIP limits.

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In determining what sulfur dioxide coal limit would be equivalent to a specific oil limit, it is likely that because of the variability of the sulfur content in coal, the numerical value of an equivalent sulfur dioxide emission limit for coal would be somewhat less than the numerical value of a current oil-SIP limit. This occurs because compliance with the coal limit would probably be verified primarily through routine coal quality analyses based on either a seven-day or thirty-day composite average of daily coal samples (in some cases, continuous sulfur dioxide emissions monitoring may also be required). In contrast, compliance with the oil limit is based on a three-hour average emissions test or in some cases on a single fuel oil sample analysis (since the sulfur content of a given grade of fuel oil is normally not significantly variable for a given tank of fuel oil that is all of the same grade or density).

For an example, assume that your coal supply were to have an annual average sulfur content of 1.3%, a maximum seven day average of 1.5%, and a maximum daily average of 1.7%. (The daily maximum emission rate would be equivalent to 2.75 lb/mmBtu for a 12,500 Btu/lb coal). If compliance were to be determined on a maximum seven-day average basis, the coal limit that would be approximately equivalent to the current maximum oil-SIP limit would be a limit of 2.4 lb/mmBtu for the example coal supply (equivalent to 1.5% sulfur coal at 12,500 Btu/lb, maximum seven-day average).

In determining how low the sulfur content would need to be for Unit 1 (assuming that using low sulfur coal was found to be an adequate control measure for that particular unit), we would take into consideration any increases that would be projected to occur at Unit 2 and Unit 3. We would also look at the costs and the enforceability problems that could result if Unit 1 were to use one grade of coal and Unit 2 were to use another grade (Unit 2 would be required to use coal with a sulfur content low enough to at least meet the Subpart D (1971) NSPS sulfur dioxide emission limit of 1.2 lb/mmBtu). As we did in the TECO case, however, we would also look at the alternative of requiring the retrofit of a flue gas desulfurization (FGD) system on each converted unit. In TECO's case, we found the cost to retrofit such a system to be excessive.

The department would specify a nitrogen dioxide emission limit for any converted unit. For Unit 2, the maximum limit is already specified in the Subpart D (1971) NSPS. For Unit

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1, the limit would be determined on the basis of what limit could be achieved through applying reasonable techniques to minimize nitrogen oxide emissions.

2. "If the DOE issues a fuel conversion order involving COM or CWS, it is expected that the Subpart D (1971) NSPS for mixtures or for coal would apply to Unit 2 but not to Unit 1. What emission limits would apply to Unit 1 for COM or CWS?"

Since a DOE conversion order will not be issued unless you wish one to be issued, it is unlikely that the order would specify coal, coal-water slurry (CWS), or coal-oil mixture (COM) alone. The order would probably allow the use of any one of those fuels if each were found to be technically and economically feasible. However, your presumption that Unit 2 would be subject to Subpart D (1971) NSPS is correct. The limit for Unit 1 would be determined as described in the answer to question 1.

3. "Should either Unit 1 or 2 be converted to direct coal firing by adding a new "slide along" boiler to the existing boiler, would this be considered a "new source" under NSPS, thus triggering the Subpart Da (1979) requirements as well as PSD for either unit? What if this type of conversion was done under a DOE conversion order?"

The addition of a "slide along" boiler to either existing unit would be considered the construction of a new source; thus, the "slide along" boiler would be subject to the Subpart Da (1979) NSPS limits. Such an addition would also be considered a modification to the facility that would subject the project to PSD review. It would be inappropriate for a DOE order to specify that a slide-along boiler must be part of the project .

4. "Are emission limits for CWS the same as for direct coal firing in all cases?"

No. It depends on which rule would apply to the conversion.

In the case of Unit 2, which is subject to the Subpart D (1971) NSPS limits, a conversion to either straight coal or CWS would result in the unit being subject to at least the Subpart D (1971) NSPS coal limits.

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In the case of Unit 1, the emission limits for CWS would probably be somewhat different than for straight coal. If a unit is converted to CWS, the coal used, for both economic and technical reasons, will probably have a very low ash content and most likely a relatively low sulfur content. The preferred particulate air pollution control technology in such a case may be a baghouse. If that were to be the case, the particulate and opacity limits for the conversion might be lower than those allowed for straight coal. However, the total cost of meeting such limits for a CWS conversion may be less than that for meeting the possibly less stringent limits for a straight coal conversion. If CWS conversion technology is proven feasible, it might be preferred in lieu of conversion to straight coal in a particular case on both economic and environmental grounds.

5. "Should Unit 2 be converted to direct coal firing by modifying the existing boiler without a DOE order, it is expected that the Subpart D (1971) NSPS applicable to coal would apply. Would the increase in boiler emissions count towards determining whether PSD applies since neither the boiler itself nor the unit as a whole was capable of accommodating coal?"

Your presumption about Subpart D (1971) NSPS applying is correct, and any increase in emissions would count towards determining whether PSD would apply to the project. If PSD were to apply, the set of emission limits for the converted unit would be established as a result of a BACT determination which, for this particular boiler, could not allow emission rates in excess of the Subpart D (1971) NSPS limits. Since the BACT determination would be for a retrofit, it is unlikely that an FGD system would be required, unless the site specific economic-versus-environmental impacts analysis clearly justified such a retrofit. Most likely, the BACT determination would require the unit to meet the Subpart D (1971) NSPS coal limits, or something very close to them.

6. "Should Unit 1 be converted to direct coal firing by modifying the existing boiler without a DOE order, could the Subpart D (1971) NSPS and PSD be avoided by maintaining compliance with the existing emission limitation (2.75 lbs/mmBtu for SO₂ and 0.1 lbs/mmBtu for particulates)? Would an NO_x emission limitation be imposed on the unit?"

The answer to the first question is no. The answer to the second question is yes.

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Conversion of Unit 1 to coal would be a modification of the unit that would subject it to the Subpart D (1971) NSPS limits for each pollutant for which the actual hourly emission rate would increase. If the actual emissions of the unit, as opposed to its allowable emissions, were to increase by more than a de minimus amount as a result of the conversion, the unit would also be subject to PSD review. Since with known technology it is improbable to convert a unit from oil to coal without having a significant increase in nitrogen oxide emissions result, the conversion most likely would be subject to PSD.

The BACT determination would include a nitrogen oxide emissions limit at least as stringent as that required by Subpart D (1971)NSPS.

7. "What criteria would FDER use in determining whether modifications to Units 1 or 2 required to allow the burning of coal, COM, or CWS would be considered "major", thus triggering the Subpart D (1971) NSPS and/or PSD requirements? What are the differences in the criteria between the NSPS and PSD regulations? For example, might a conversion to COM or CWS be considered minor for PSD applicability whereas a conversion to coal would be major due to the more extensive modifications required? Would this be different for NSPS applicability?"

With respect to the Subpart D (1971) NSPS requirements, "modification" means any physical change in, or change in the method of operation of, (--an existing unit--) which increases the amount of emission of any air pollutant for which a standard applies. As discussed in the answers to the previous questions, any conversion of Unit 2 to coal will require compliance with emission limits that are at least as stringent as the Subpart D (1971) NSPS requirements for coal.

Conversion of Unit 1 to coal, COM, or CWS would likewise require compliance with at least the Subpart D (1971) NSPS requirements for each pollutant for which there would be an increase in the actual emission rate, unless the conversion of Unit 1 were done pursuant to a DOE conversion order. In that case, the unit would be subject to requirements established by the state on a case-by-case basis. The question of whether the change is "major" does not arise in connection with determining the applicability of the NSPS regulations.

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With respect to PSD, a "major modification" is a physical change in, or change in the method of operation of a major facility (entire plant which, if it were a new plant, would be subject to PSD review) that would result in a significant net increase in the emission of any regulated pollutant. The significance levels are listed in Table 500-2 of Rule 17-2.500. They are generally different for each air pollutant. The net increase is usually determined by using as a base the actual emissions from all sources at the power station over the two year period just prior to the filing of a permit application. An explanation of how actual emissions and net emissions increases are calculated is given in Rule 17-2.500.

Again, whenever a unit is converted from oil to coal, it is likely to result in a significant net increase in nitrogen oxides emissions. However, it may be possible to convert a unit from oil to coal without a significant increase in particulate or sulfur dioxide emissions, and, in fact, it is the view of the department that, unless there are extenuating circumstances in a particular case, conversions should not result in increased emissions of either of these pollutants. Therefore, unless there are significant differences in the nitrogen oxides emission rates associated with COM, CWS, and straight coal, the use of any one of the three would result in the same rule applicability determination.

The extent of physical modification required to convert each unit and to provide the necessary fuel, waste handling, and storage capabilities would enter into the determination as to whether the conversion is technically and economically feasible and, therefore, would have a bearing on whether a DOE conversion order could be issued. Other than that, the extent of needed physical modification would not, in your case, have a direct bearing on the rule applicability determination.

8. "Should PSD apply, would a four month continuous air quality monitoring program satisfy the air quality assessment requirements?"

Most likely it would, unless there is considerable doubt about the background levels of air quality in the Lakeland area. You should keep in mind that if you opt to obtain a DOE conversion order for Unit 1 (to exempt Unit 1 from automatically being subject to any of the otherwise applicable Subpart D (1971) NSPS limits), a site-specific Environmental

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Impact Statement (EIS) will have to be completed before DOE can issue the conversion order. The site-specific EIS most likely would take longer than four months to complete. Either way you go, there should be adequate time to collect any needed ambient air quality monitoring data.

9. "Would FDER consider a bubble concept for the McIntosh plant whereby a converted unit could avoid PSD and possibly NSPS if emissions for all three units combined were held constant?"

A federal court recently ruled that neither a state nor EPA can allow the "bubbling" of a non-NSPS source with an NSPS source if the result would be that the NSPS source ends up emitting more than the NSPS limits allow. The NSPS limits, which are technology based standards, apply on a unit-by-unit basis. PSD can be avoided if there were to be no net increase in the emission of any regulated pollutant. However, it is unlikely that you could convert Unit 1 or 2 to coal without a net increase in nitrogen oxides emissions.

10. "Does FDER concur with USEPA's determination that peat is not a 'fossil fuel' and is therefore not covered by NSPS?"

Yes. FDER has adopted federal new source performance standards (NSPS) by reference. EPA has delegated the administration of these rules in Florida to the department. Under that delegation agreement the department will interpret the NSPS rules in the same manner that EPA interprets those rules.

11. "Does FDER consider peat to be a 'carbonaceous fuel'?"

No. The 1975 ASTM standard D-2607-69 states that "the term peat refers only to organic matter of geological origin, excluding coal, formed from dead plant remains in water in the absence of air. It occurs in a swampland, or marsh, and it has an ash content not exceeding 25% by dry weight." Carbonaceous fuel is defined in Rule 17-2. We would not consider peat to be either a fossil fuel, or a carbonaceous fuel, but a separate fuel category.

12. "If a combination of peat and a fossil fuel are fired simultaneously, how much fossil fuel can be fired before the unit is considered to be fossil fuel fired?"

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If your questions is with respect to the NSPS applicability, it would depend upon how much fossil fuel the boiler is capable of firing. NSPS applicability is based on the maximum design capacity of a unit and not necessarily the normal operating rate. If the unit were designed to consume greater than 250 mmBtu/hr of auxiliary fossil fuel, NSPS limits would apply providing there is not a specific exemption that applies to the unit.

13. "For a new peat fired boiler, what emission limits would apply under the BACT requirements of the PSD regulations?"

The emission limits would be determined on a case-by-case basis as described in Rule 17-2.630. A BACT determination is a type of alternatives analysis. We would most likely look at the technical feasibility and the costs associated with retrofitting the unit with a baghouse versus a wet scrubber versus an electrostatic precipitator. If each were technically feasible we would determine what emission rates could be achieved through the application of each; compare the resultant air quality and other impacts with the cost of achieving each emission rate; and then, select the emission limits that represent the technology which on balance is the best alternative of those that are available. One of the particular concerns we would have with peat combustion would be the potential for increased emissions of mercury. Mercury tends to concentrate in peat bogs.

14. "For a new combination peat and coal fired boiler what emission limits would apply under the BACT requirements of the PSD regulations?"

The answer is the same as that given to question 13 with one additional provision. For a new utility boiler which would be designed to fire more than 250 mmBtu/hr heat input with coal, the BACT determination for such a unit would have to be at least as stringent as the Subpart Da(1979) NSPS limits.

15. "If Unit 2 were converted from oil to peat under a DOE fuel conversion order (thus eliminating BACT requirements), what regulatory basis would be used to determine appropriate emission limitations?"

The department's new fuel conversion rule.

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Based on the information you have provided , it seems that for planning purposes you should:

(a) evaluate the cost and feasibility of retrofitting your units with a FGD system;

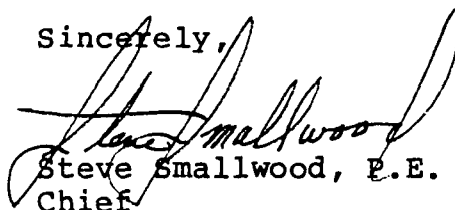
(b) evaluate low-sulfur coal alternatives that would result in meeting the Subpart D (1971) NSPS emission limits (if you wish to convert both units or just Unit 2); and,

(c) if you wish to convert only Unit 1, evaluate the cost vs air quality and other impacts of converting the unit to coal with a sulfur content in the range of 1.2 - 1.5% by weight, as compared to the cost vs impacts associated with a 0.7% S coal, and with an FGD retrofit.

COM, CWS, and straight coal conversions are all possible. You would also need to provide for adequate control of particulate emissions from any on-site coal and ash handling facilities. If you chose COM or CWS, you may be able to have the fuel prepared off-site or you may be able to purchase these types of fuels from another company.

I can meet with you or others here in Tallahassee if you wish to further discuss the conversion options for the McIntosh power station. If you need clarification on any part of this letter please call me at 904/488-1344.

Sincerely,



Steve Smallwood, P.E.
Chief

Bureau of Air Quality
Management

SS: jr

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