CHARITON VALLEY BIOMASS PROJECT

Environmental Permits Report

Prepared for:
The United States Department of Energy
Contract Number: DE-FC36-96GO10148

Submitted by:
Chariton Valley RC&D
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Centerville, Iowa 52544-8922

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June 19, 2002

Chariton Valley Biomass Project (Phase I)
Deliverable 4 – Environmental Permits Report

1.0 Chariton Valley Biomass Project's Permit-Related Activities, 2001-02

1.1 Emissions Reporting for Cofire Test 1

Chariton Valley Biomass Project's (CVBP's) Cofire Test 1, conducted at Alliant Energy's Ottumwa Generating Station (OGS), concluded in January 2001. On March 16, 2001, Mr. Alan Arnold (Alliant Energy) sent a brief report to the Iowa Department of Natural Resources (IDNR) summarizing the preliminary emissions findings from Cofire Test 1. The brief report fulfilled IDNR's variance requirements for Cofire Test 1. Mr. Arnold's report was noted as being a "preliminary" report in nature, as there were numerous outstanding data issues requiring further analysis.

In February 2002, the National Renewable Energy Laboratory (NREL) completed a draft report entitled *Summary of Chariton Valley Switchgrass Co-Fire Testing at the Ottumwa Generating Station in Chillicothe, Iowa*. This draft report included updated emissions analysis performed subsequent to the March 16, 2001 submittal to IDNR. A final technical report from NREL is anticipated in July 2002. During the summer of 2002, Mr. Wade Amos (NREL) and CVBP representatives may present the Cofire Test 1 emissions results to the IDNR.

1.2 Antares Group's Role in the CVBP's Environmental Permitting Activities

Antares Group, Incorporated joined the CVBP during the Fall of 2001. During October 2001, the Antares Group attended a CVBP planning meeting at the Chariton Valley Resource Conservation and Development (CVRCD) in Centerville, Iowa. The October 2001 meeting marked the beginning of an ongoing, cooperative permitting effort among Alliant Energy, the CVRCD, and the Antares Group. The Antares Group played an integral role in developing the Environmental Permitting Plan approved by the IDNR, and in preparing this Environmental Permits Report for the US DOE. CVRCD and Alliant's inputs, expressed needs, and review have been essential and extensive throughout the process to date.

1.3 March 2002 Meeting Between CVBP and IDNR

Some of the Chariton Valley Biomass Project (CVBP) partners had the opportunity to meet with several senior and key members of the Iowa Department of Natural Resources (IDNR) on March 22, 2002. The meeting began with Alliant presenting updated information from NREL's report, *Summary of Chariton Valley Switchgrass Co-Fire Testing at the Ottumwa Generating Station in Chillicothe, Iowa,* to the IDNR.

The meeting focused on air pollution permitting issues facing the CVBP at Alliant Energy's OGS. The CVBP presented a preliminary permitting approach, along with a tentative timeline, for discussion. Differences between the CVBP's preliminary

permitting approach and IDNR's expectations were identified. A major difference was one of viewpoint – while the CVBP is an R&D project, the IDNR initially viewed the plans to construct cofiring facilities during Campaign 2 as an irreversible shift toward commercial operation. This difference in viewpoint, coupled with the inconclusive Cofire Test 1 emissions results, raised concerns within the IDNR. The IDNR's concerns focused on potential Prevention of Significant Deterioration (PSD) issues, and the IDNR's reticence to issue a second variance to allow Cofire Test 2, given that the CVBP appeared to IDNR to be advancing beyond the testing phase.

The CVBP partners and the IDNR discussed IDNR's concerns. The primary outcome from the March 2002 meeting was a mutual understanding of the project's status, the project's potential benefits, future project campaign R&D objectives, IDNR's permitting expectations, and a few potential permitting pathways for the CVBP. While recognizing legal and regulatory constraints, IDNR's interest and cooperation levels during the meeting could be characterized as "highly supportive."

1.4 Development of the Environmental Permitting Plan for IDNR

After the March 2002 meeting, the CVBP developed a more comprehensive Environmental Permitting Plan for the IDNR, with the goals of meeting IDNR's expectations while not significantly altering the CVBP's planned timeline. The draft Environmental Permitting Plan was submitted to IDNR on April 19, 2002.

The Environmental Permitting Plan is flexible and offers many pathways to commercial switchgrass cofiring operations, dependent upon intermediate cofire test outcomes. The two essential themes of the Environmental Permitting Plan are: 1) the CVBP is an R&D project, and 2) federally enforceable restrictions on switchgrass quantities (quantities cofired annually) will be written into the feed handling equipment's construction permits, subject to relaxation in the future if cofire emissions tests indicate that such relaxation would not jeopardize (PSD) emissions thresholds. The switchgrass quantity restrictions will be relaxed in phases, increasing for Cofire Test 3, and then again for commercial operation.

On May 3, 2002 the IDNR responded to the April 19, 2002 draft Environmental Permitting Plan. Overall, the IDNR's response was favorable, mentioning only a few concerns in regard to the amounts of time allotted for regulatory decision making at various steps in the project's development. Mr. Dave Phelps, Supervisor of the Construction Permits Section of the IDNR, also provided a basis for the draft letter of cooperation on May 3, 2002.

Incorporating IDNR's suggested changes, and also incorporating some changes necessitated by CVBP design timeline changes, the CVBP submitted a final draft of the Environmental Permitting Plan to IDNR on May 17, 2002 (see Appendix A for a copy of the final draft of the Environmental Permitting Plan). On May 21, 2002, the IDNR approved the Environmental Permitting Plan provided in Appendix A.

2.0 Key Points from IDNR Letter of Cooperation

On May 21, 2002, along with approving the Environmental Permitting Plan, the IDNR signed a revised letter-of-cooperation (see Appendix B for a copy of the signed letter of cooperation). The key points in the IDNR letter-of-cooperation are the following:

1. The IDNR has been and continues to be supportive of opportunities for burning alternative fuels, and the IDNR is committed to working with the CVBP partners to find they best way to proceed within the confines of the various environmental regulations.
2. Given that the Cofire Test 1 emissions results were inconclusive, the IDNR recognizes that additional emissions testing, such as that now planned during Cofire Test 2 (and Cofire Test 3), will be necessary.
3. The IDNR fully supports proceeding with the CVBP through Cofire Test 2.
4. The IDNR looks forward to the opportunity to continue working with the CVBP partners involved to resolve the remaining questions regarding emissions, while at the same time allowing for the evaluation of the project from energy and holistic standpoints.
5. After the IDNR has an opportunity to review the construction permit applications for Campaign 2 equipment, the IDNR plans to issue a variance to allow switchgrass to be combusted during Cofire Test 2. The construction permit applications should reflect all equipment existing at the OGS, including the equipment associated with the CVBP.
6. The construction permits for Campaign 2 construction will establish a federally enforceable restriction on the amount of switchgrass that can be cofired annually (6000 tons/year).
7. An evaluation of the emission data from Cofire Test 2 will be needed in order to determine how the project will proceed from that point forward.
8. Air pollution permitting issues are the most challenging environmental permitting issues for the CVBP. The IDNR recognizes that the storm water permitting issues associated with the CVBP are routine (i.e., Alliant has ample experience in dealing with such issues and they do not represent a potential impediment to the CVBP).

3.0 Non-Air Environmental Issues

3.1 Storm Water Permitting

Construction of equipment and buildings during Campaign 2 and Campaign 3 will require storm water construction permits. In addition, there may be construction of a berm around the on-site switchgrass storage / processing area at the OGS. This may require Alliant to amend its storm water NPDES permit with the IDNR. Both of these storm water permit issues, including a tentative timeline for action, are addressed in the Environmental Permitting Plan (see Appendix A). IDNR's confirmation of the routine nature of the CVBP's storm water permitting needs is provided in the IDNR's letter-of-cooperation (see Appendix B).

3.2 Solid Waste

3.2.1 Fly-Ash from Coal / Switchgrass Cofiring

The major, potential solid waste issue faced by Alliant related to the switchgrass cofiring project is in regard to its effect on the unit's fly ash. The sale and management of fly ash for cement aggregate, under coal-only operation, is an important part of the OGS revenue stream. Until the ASTM C618 standard that precludes the sale of coal/switchgrass cofired (fly) ash as a cement aggregate is changed (or a new comparable-value market for coal/switchgrass cofired (fly) ash is identified), this issue will remain important. For now, the coal/switchgrass cofired ash will continue to be managed by Alliant and its ash affiliates.

Project partners have initiated development of the scope of work with ISG Resources, Inc. and ISU to conduct research on the cofire fly ash in support of efforts to address limitations placed on its use by ASTM C618.

3.2.2 Baling Twine Disposal/Recycling

The only other solid waste issue created by the switchgrass cofiring project at OGS, in addition to those addressed under coal-only operation, is the need to dispose of the twine that bounds the switchgrass bales. This twine will be collected and either disposed of into the municipal waste stream or recycled.

3.3 National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) is the basic national charter for protection of the environment. It establishes policy, sets goals (section 101), and provides means (section 102) for carrying out the policy. Section 102(2) contains "action-forcing" provisions to make sure that federal agencies act according to the letter and spirit of the Act. The regulations that implement section 102(2) direct federal agencies about what they must do to comply with the procedures and achieve the goals of the Act. The

President, the federal agencies, and the courts share responsibility for enforcing the Act so as to achieve the substantive requirements of section 101.

NREL and the CVRCD have been handling the NEPA process with DOE. NREL and the CVRCD will continue to ensure that NEPA requirements are being met.

3.4 Noise

The proposed process building will have insulation on all walls and the ceiling. The four milling rooms will have an insulated wall separating them from the main processing area, and they will also have separation walls between the individual rooms. The intent is to reduce the noise levels emitted to the main processing area from the milling rooms. The intent is to reduce the noise level in the main processing area below the OSHA 8-hour noise threshold limit – this would allow personnel to enter the main processing area without being required to wear hearing protection. When personnel enter the milling equipment rooms, they would be required to wear hearing protection.

The cost for applying additional sound abatement to the milling rooms (over and above the insulation) will be included in the cost estimate - this cost will be evaluated and compared to the cost of Alliant's current policy. Alliant's current policy is that hearing protection is required when entering the boiler or other buildings (except office or break room areas). The noise levels will be tested after final installation to determine future modifications or procedures.

The storage barn will also have insulation on all walls and the ceiling. The noise levels generated from the deliveries and crane and bale transfer equipment are expected to be far below the 8-hour threshold limits, and it is not expected that hearing protection will be required. The delivery drivers are expected to deliver and clean up their truck-beds in 20 minutes or less. The crane operator is in an air-conditioned cab. Noise levels are not expected to not be an issue for the clean up personnel or maintenance people. Under normal operation, the delivery trucks will be summoned to enter through the overhead doors and then the doors will be closed during unloading.

The gallery will have a fire door at approximately the mid point of the span. At this fire door there will be man-doors entering the processing building on each side of the transfer equipment. At these man-doors, if hearing protection and other safety gear are required, there will be appropriate postings. The same is true for all doors entering the process building.

The sound level emitted from the processing building to adjacent buildings is not expected to be of a concern.

3.5 Fire Prevention / Protection

Fire prevention / protection is an important consideration embedded in the biomass handling system's design.

In April 2002, one of the design contractors for the CVBP, Bradford Conrad Crow Engineering Company, met with the State Fire Marshal Division of the Iowa State Building Code Bureau. The purpose of the meeting was to discuss the CVBP and fire system related issues. A comprehensive letter from Mr. Dave Ganz, P.E. of Bradford Conrad Crow to Mr. Leo Duffy of the Iowa State Fire Marshal Division, summarizing the April 2002 discussion and fire protection measures to date, is included in Appendix C.

Further development of the fire system plan has occurred since Mr. Ganz wrote the April 2002 letter. Communication between the CVBP design team and the Iowa State Building Code Bureau is an ongoing process. The following features are part of the current fire system plan (some of these are discussed in the letter in Appendix C):

1. The storage building, gallery and process building would be sprinkled.

2. There would also be six hose reels in the storage building and standpipe connections for fire hoses. There would also be fire extinguishers in the buildings.

3. All building systems are dry valve systems with independent compressors in each valve house.

4. The equipment (debaler) in the process building would have deluge systems.

5. There would be sprinklers under some wide equipment, and there would be spark detection and mist systems in the dust collection systems.

6. Hydrants would be placed outside as needed for reach and per code.

4.0 Future Environmental Permitting Steps

4.1 Timeline as Given in Environmental Permitting Plan

The following table, taken from the Environmental Permitting Plan given in Appendix A, summarizes the environmental permitting timetable of the CVBP. Only air permitting and storm water permitting needs are shown. A more detailed discussion is provided in the Environmental Permitting Plan (Appendix A).

CVBP Permitting Need	Permit Issuance Date
AIR PERMITTING NEEDS	
After the construction permit process, IDNR issues variance to allow switchgrass to be burned during R&D Cofire Test 2. Issue construction permits to allow construction of switchgrass feed equipment (and buildings) during Campaign 2.	March 31, 2003
IDNR approves emissions test protocol before R&D Cofire Test 2 can begin.	September 30, 2003
IDNR issues variance to allow switchgrass to be burned during R&D Cofire Test 3. Issue construction permits to allow construction of switchgrass feed equipment (and buildings) during Campaign 3.	July 1, 2004
Title V permit amended to add switchgrass as an approved alternative fuel.	February 15, 2005
STORM WATER PERMITTING NEEDS	
IDNR issues storm water construction permit for construction taking place during Campaign 2.	March 31, 2003
(Possibly) amend NPDES permit to accommodate berm construction.	September 30, 2003
IDNR issues storm water construction permit for construction taking place during Campaign 3.	July 1, 2004

4.2 Critical Steps in Environmental Permitting Plan

There are a few critical steps in the Environmental Permitting Plan that warrant highlighting. They are as follows:

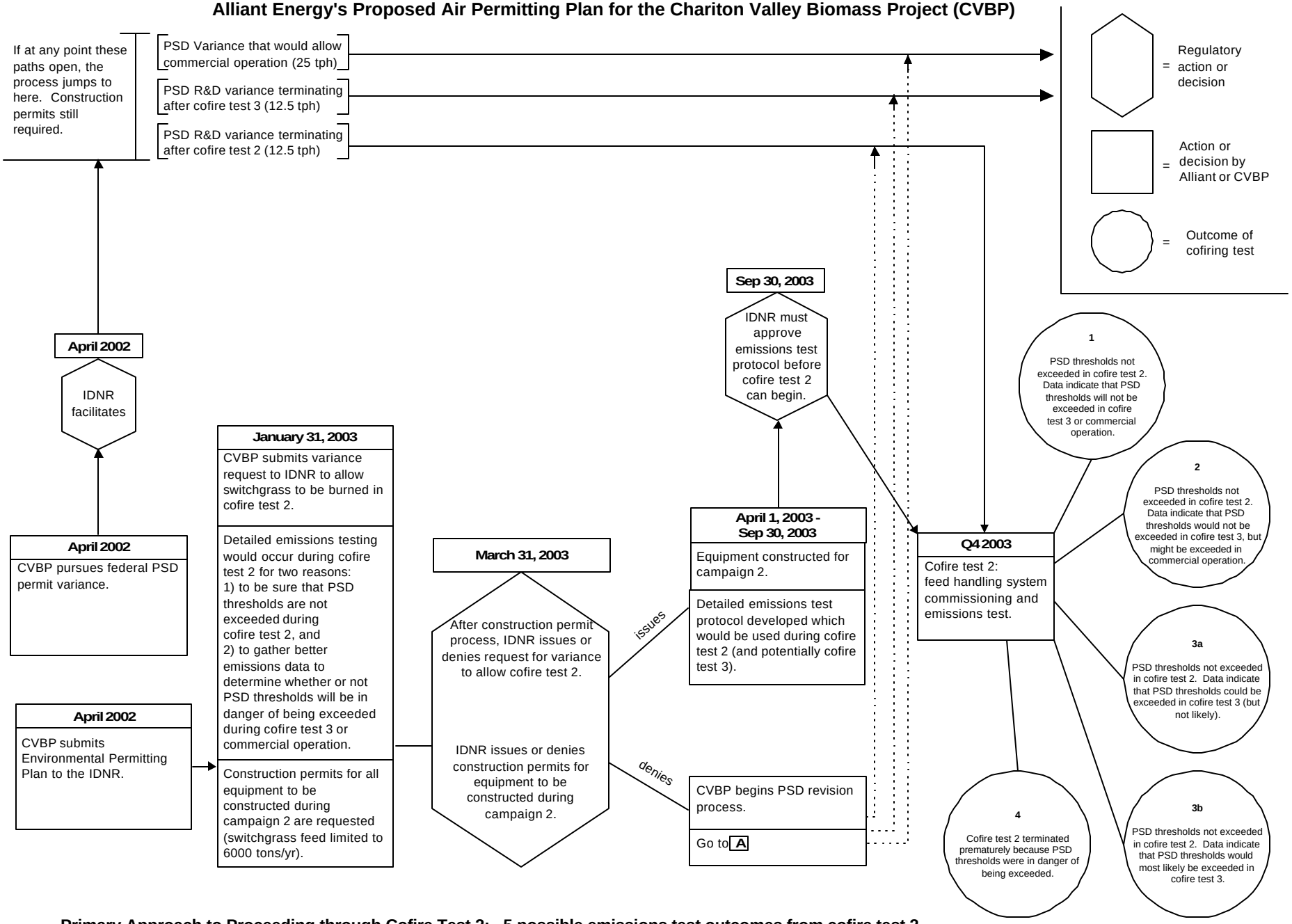
1. During the second half of 2002, the primary permitting objectives are the following:

    a. Alliant Energy, with assistance by the Antares Group and CVRCD, will complete the construction permit applications for the Campaign 2 equipment and submit them to IDNR.
    b. Alliant Energy, with assistance by the Antares Group and CVRCD, will request storm water construction permits for Campaign 2 construction (from IDNR).
    c. Alliant Energy, with assistance by the Antares Group and CVRCD, will request a variance to allow switchgrass to be burned at the OGS during Cofire Test 2.

2. During the second half of 2002 and the first half of 2003, the CVBP partners will develop an improved test protocol for Cofire Test 2. The improved test protocol will focus on emissions test procedures, but will recognize the need to attempt to "optimize" boiler performance under cofiring operations to attain the most favorable emissions results possible. The improved test protocol must be approved by the IDNR before Cofire Test 2 can begin. It is emphasized that attaining favorable emissions results is vital to increasing the CVBP's chance of reaching commercial operation – favorable emissions results will greatly ease the air permitting process for Cofire Test 3 and beyond. It is noted that the Environmental Permitting Plan (Appendix A) identifies some of the components that will be essential to an improved test protocol. In addition, it will also be essential to keep running totals of NOx and, if possible, PM/PM10 emissions during Cofire Test 2 to ensure that PSD thresholds are not jeopardized.

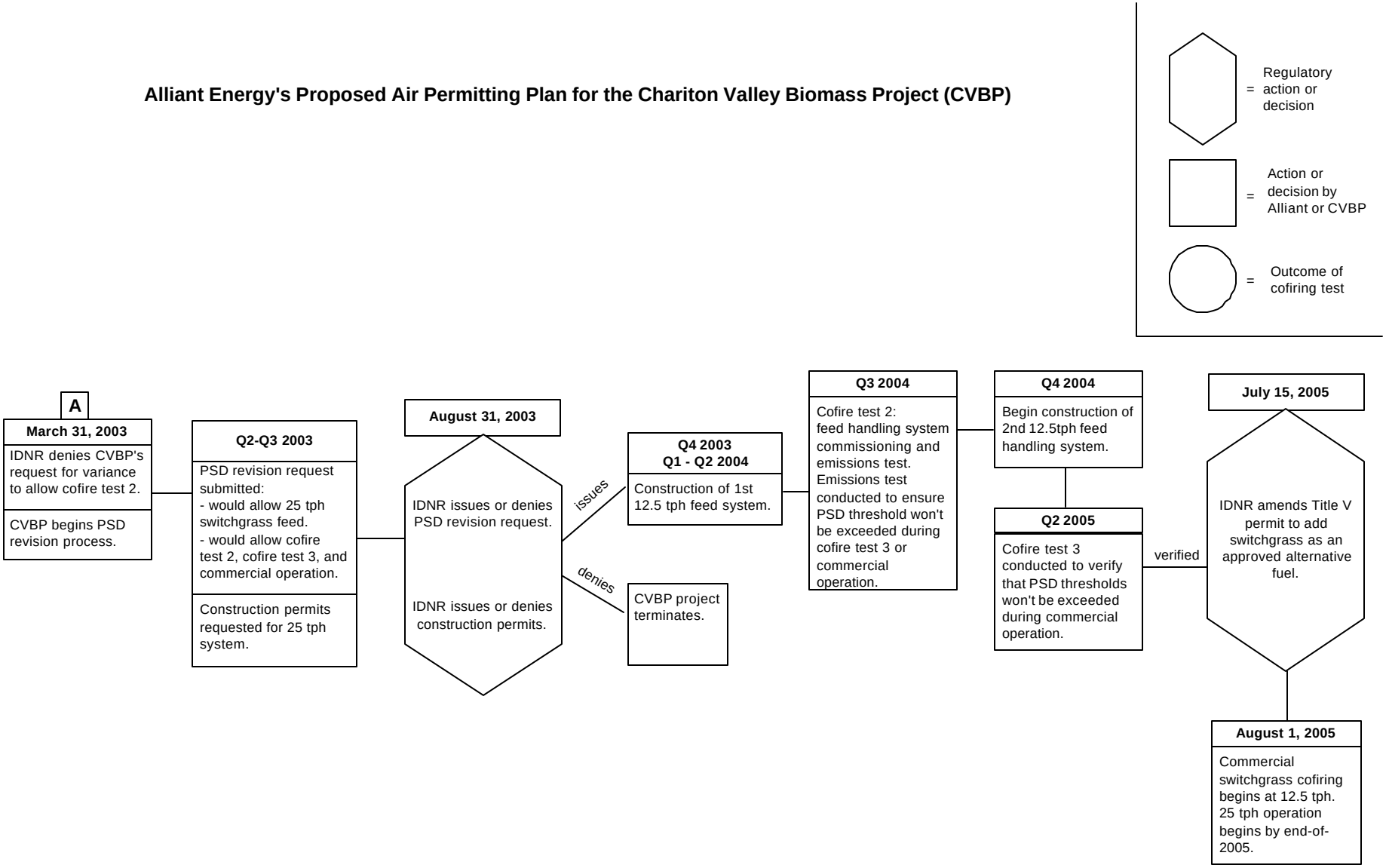
APPENDIX A - Alliant Energy's Environmental Permitting Plan for the Chariton Valley Biomass Project

Alliant Energy's Proposed Air Permitting Plan for the Chariton Valley Biomass Project (CVBP)



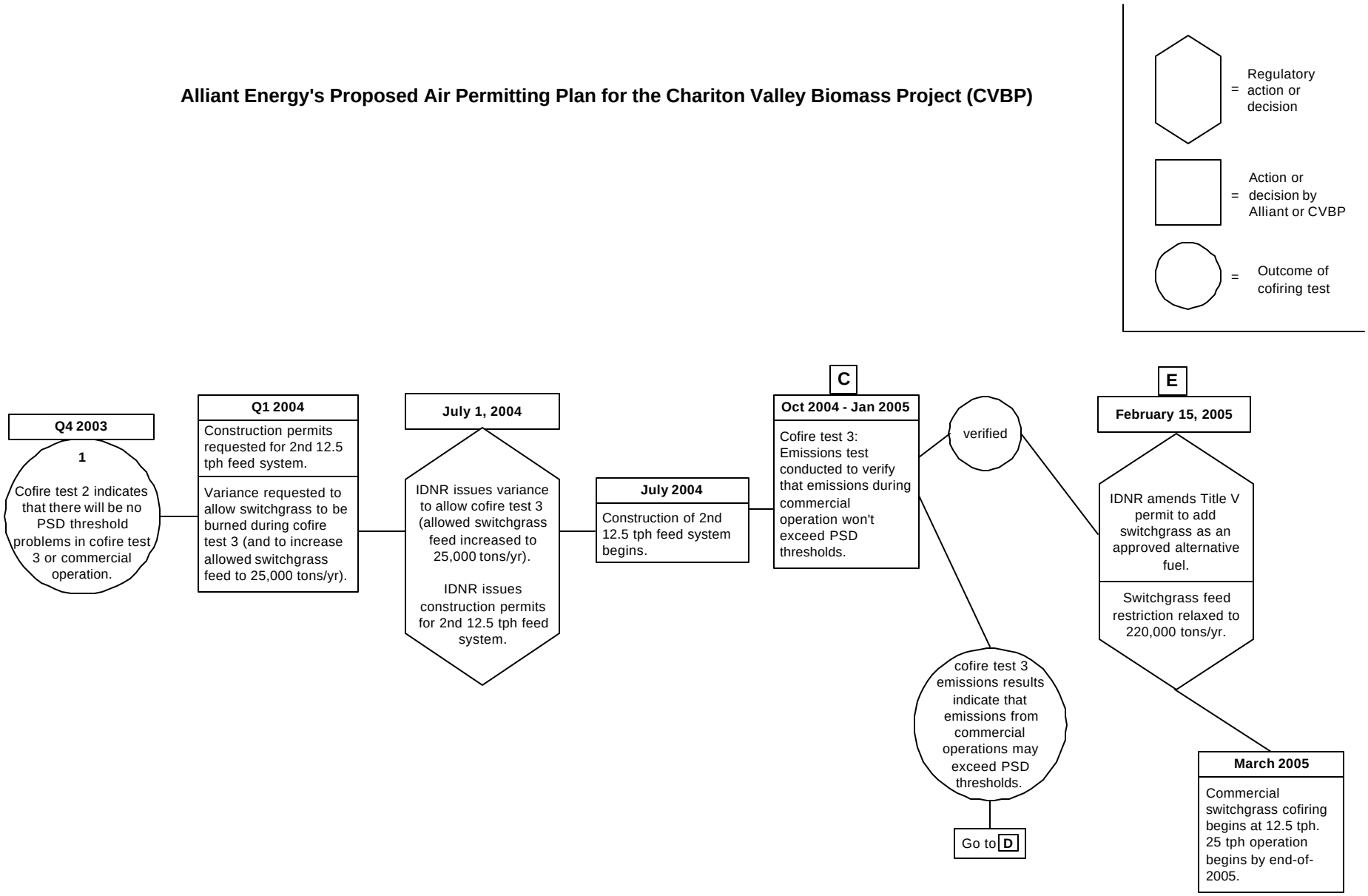
Primary Approach to Proceeding through Cofire Test 2: 5 possible emissions test outcomes from cofire test 2.

Alliant Energy's Proposed Air Permitting Plan for the Chariton Valley Biomass Project (CVBP)



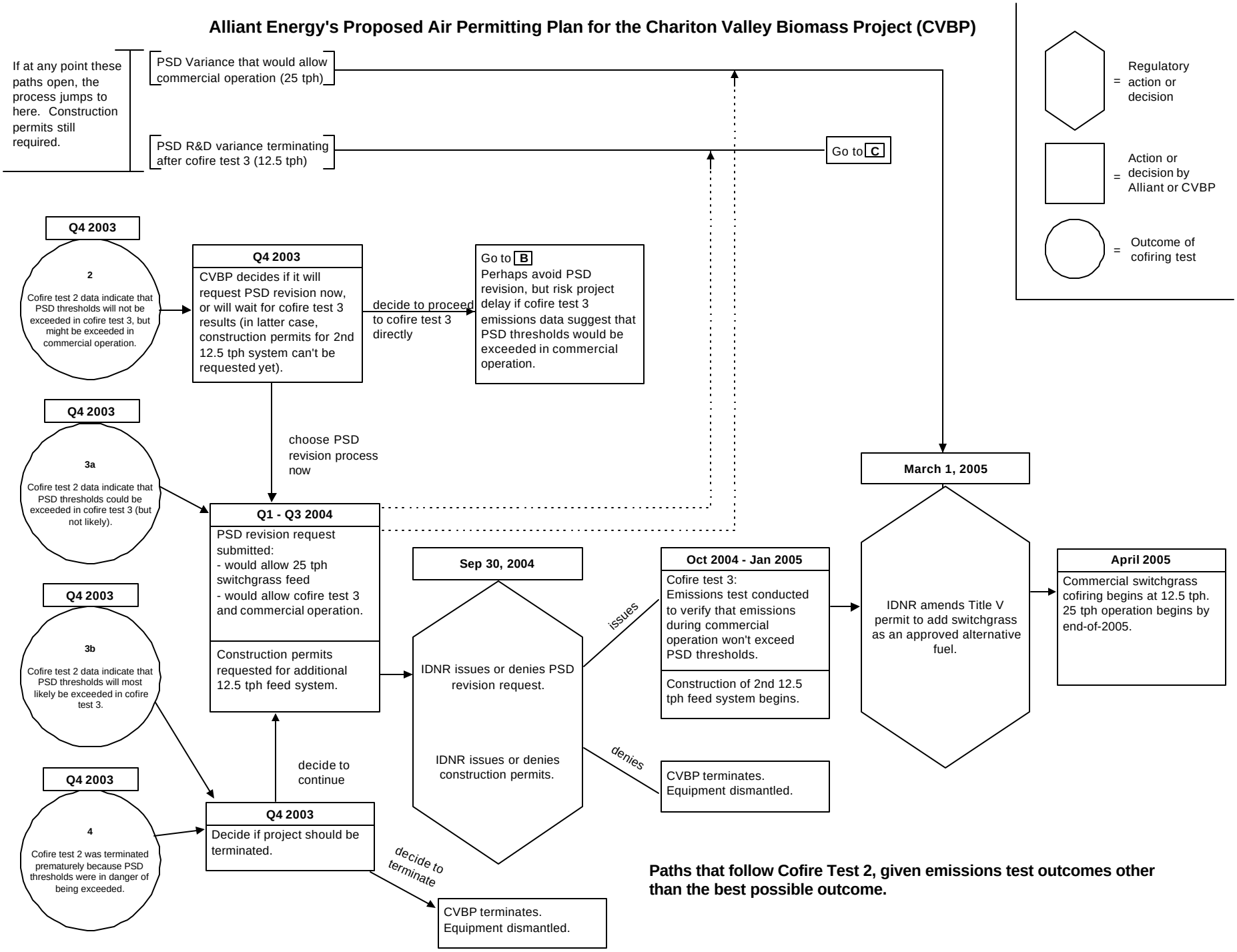
PSD Revision Path if IDNR denies initial request for variance to allow Cofire Test 2.

Alliant Energy's Proposed Air Permitting Plan for the Chariton Valley Biomass Project (CVBP)



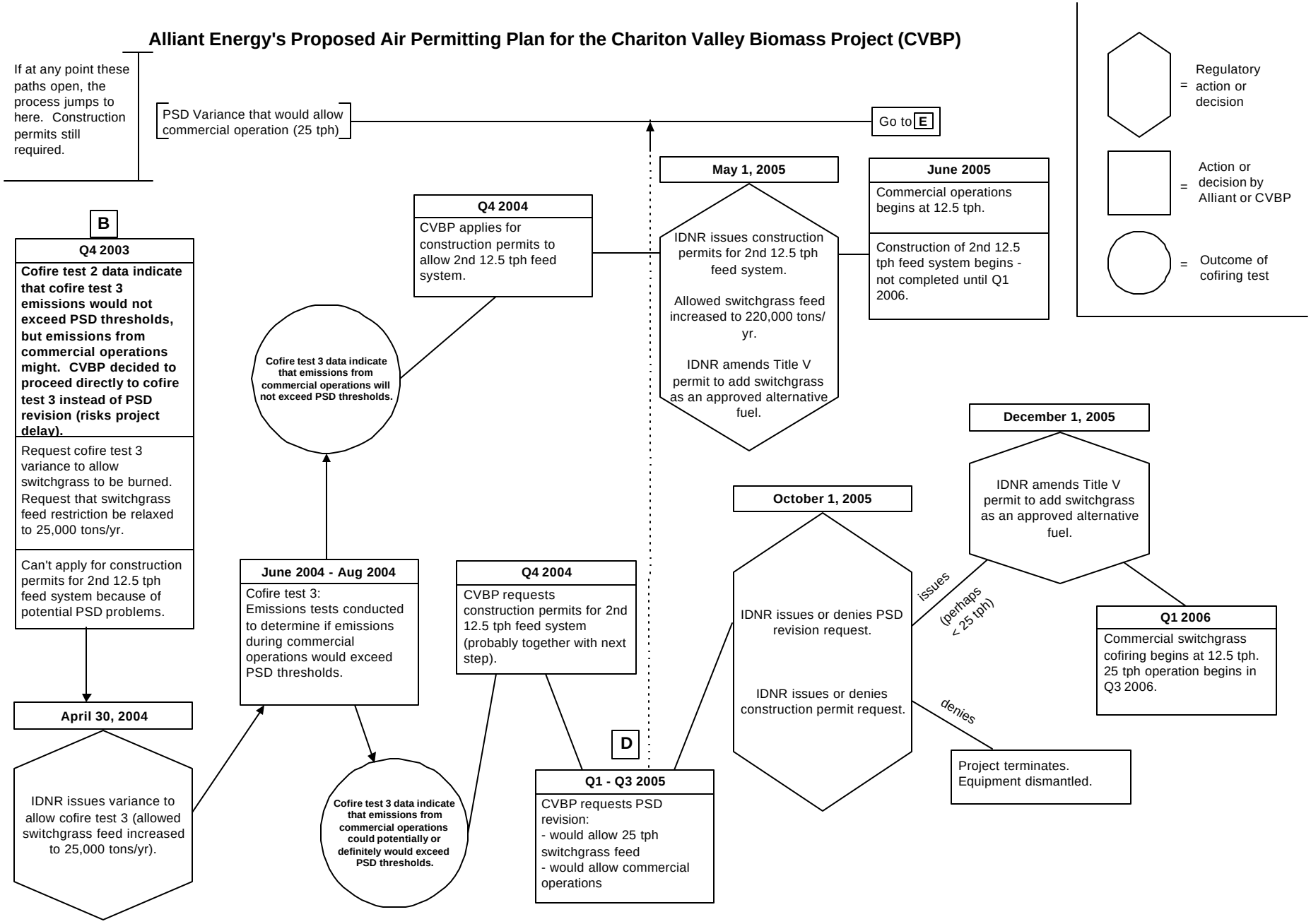
Path that follows Cofire Test 2, given the best possible emissions test outcome (most optimistic timeline).

Alliant Energy's Proposed Air Permitting Plan for the Chariton Valley Biomass Project (CVBP)



Paths that follow Cofire Test 2, given emissions test outcomes other than the best possible outcome.

Alliant Energy's Proposed Air Permitting Plan for the Chariton Valley Biomass Project (CVBP)



APPENDIX B – IDNR Letter-of-Cooperation

Fields of Opportunities

STATE OF IOWA

THOMAS J. VILSACK, GOVERNOR
SALLY J. PEDERSON, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
JEFFREY R. VONK, DIRECTOR

May 21, 2002

Alan Arnold
Senior Environmental Specialist
Alliant Energy
200 First Street, SE
PO Box 351
Cedar Rapids, IA 52406-0351

Re: Chariton Valley Biomass Project
Ottumwa Generating Station
Plant No. 90-07-001

Dear Mr. Arnold:

Over the past several years, the Department has been working with Alliant Energy, the Chariton Valley Resource Conservation and Development, Inc. (CVRCD), and other Chariton Valley Biomass Project (CVBP) partners to study the feasibility of burning a renewable energy source in the boiler at the Ottumwa Generating Station. As you know, the Department has been supportive of this project and has worked with the CVBP partners to find the best way to proceed within the confines of the various environmental regulations. To this end, a testing program was undertaken beginning with Cofire Test 1 to evaluate the emission changes that may occur while burning switchgrass. Unfortunately, the information from Cofire Test 1 was not as conclusive as the CVBP had hoped. It is generally believed that initial operational problems with feeding the alternative fuels, and the relatively short duration of the test burns, did not allow for an adequate evaluation. Therefore, it is difficult to understand the emissions implications that would be associated with commercial cofiring. To this end, it will be necessary to conduct additional emissions testing as it is planned during Cofire Test 2. The Department looks forward to the opportunity to continue working with the CVBP partners involved to resolve the remaining questions regarding emissions, while at the same time allowing for the evaluation of the project from energy and holistic standpoints.

The Department fully supports opportunities for burning alternative fuels, such as the opportunity offered by the CVBP project. As you know, any large generating station has very significant air emissions. There are potential positive environmental effects from this project - not only in regard to air pollution, but also in regard to other environmental media, even positive wildlife benefits. In addition, the Department does not overlook the non-environmental impacts associated with the CVBP - the benefits to the overall state energy balance and to the Iowa economy are not insignificant.

The first draft of the CVBP permitting plan submitted to the Department did not allow for sufficient time between the CVBP's planned request for the Campaign 2 construction permits and the desired issuance date. In addition, after the submittal of the first draft plan, for internal

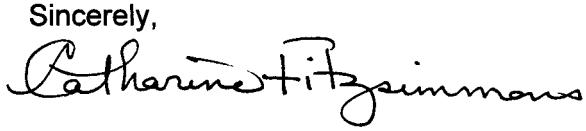
reasons the CVBP has delayed its target permit issuance date from July 31, 2002 to March 3 2003. As a result, the final CVBP permitting plan that you have submitted, which this letter endorses, reflects an updated schedule and provides for the 60-day period preferred by the Department for the Campaign 2 construction permit application review.

The first draft plan indicated that the Department would issue a variance to allow for the cofiring/testing of switchgrass during Cofire Test 2 concurrently with issuing the construction permits for Campaign 2. To be clear, the variance will need to be issued after the Department has an opportunity to review the applications and issue the construction permits for any equipment that needs to be added to the OGS site. The final CVBP environmental permitting plan that you have submitted reflects this change. The construction permit applications should reflect all equipment existing at the plant, and also all equipment associated with the biomass project. This comprehensive information will be needed in order to properly make the determination of whether any emission changes from the boiler during switchgrass cofiring, when added to any emission increases associated with the processing of alternative fuels, could result in emission increases that might trigger PSD.

The construction permits for the 2nd Campaign construction will establish a federally enforceable restriction on the amount of switchgrass that can be cofired annually (6000 tons/year). An evaluation of the emission data after Cofire Test 2 will be needed in order to determine how the project will proceed from that point forward. One possibility, assuming best-case Cofire Test 2 emissions results, would be for the Department to allow Campaign 3 construction (after processing the Campaign 3 construction permit application) while also relaxing the switchgrass quantity restriction from 6000 tons/year to 25,000 tons/year to enable Cofire Test 3. The Cofire Test 3 emissions results would then be evaluated in order to decide how to best proceed to commercial operation. It is noted that if Cofire Test 2 emissions results are not positive, PSD revision may be necessary. This is the nature of the flexible permitting plan that you have proposed.

In summary, the IDNR fully supports proceeding with this project through Cofire Test 2. In regard to air pollution permitting issues and stormwater permitting issues (the stormwater permitting issues are a routine matter), the CVBP environmental permitting plan provides many potential paths to commercial switchgrass cofiring. While none of the paths are guaranteed because they depend upon intermediate cofiring test outcomes, the plan presents a comprehensive and viable roadmap for potentially acquiring the environmental permits necessary for the CVBP to operate commercially. After Cofire Test 2, both the Department and the CVBP will be in a better position to identify the appropriate permitting path going forward. If you have any questions regarding this project, or if the Department can be of further help in the near future, please do not hesitate to call.

Sincerely,



Catharine Fitzsimmons
Interim Air Quality Bureau Chief

APPENDIX C – Fire Prevention / Protection Letter from the Bradford Conrad Crow Engineering Company to the State Fire Marshal Division of the Iowa State Building Code Bureau

BRADFORD
CONRAD
CROW ENGINEERING CO.

CIVIL • STRUCTURAL • MECHANICAL ENGINEERS

Leo Duffy
Facilities Engineer
State Fire Marshal Division
Iowa State Building Code Bureau
215 E. 7th St.
Des Moines, IA 50319

April 23, 2002

Leo,

I appreciate the time you took out of your schedule to discuss the proposed biomass project future installation and fire system related issues. I hope the copies of our preliminary design layout drawings I left with you will help you on any discussion you may have with any of your other staff members. If you have any questions please give me a call.

Here is a recap of the brief Proposed Project Description:

The purpose:

The purpose of the project is to demonstrate that a renewable energy source supply and feed system (more specifically Switch grass feed) can be added to an existing coal boiler plant, show that it could be commercially operated, and reduce the coal usage by 5 percent. The Department of Energy along with Chariton Valley have combined efforts towards funding this switch grass project. The proposed system will be designed for 25 tph and will have an initial installation (for testing) at 12.5 tph for 2000 hours, later the remaining equipment will be added and further tested at the final 25 tph capacity. The purpose for the tests is to test the equipment, the farmer resources, and test outcomes of the mixed fuels (but knowing this is commonly done in Europe). There will also be other minor test items as well. This proposed project could become the first commercially run switch grass fuel feed installation installed in America. It's my understanding there is another similar project currently being developed in Alabama that will be following closely behind.

The Engineering Team:

Our company, Tom Miles of T.R. Miles (who was instrumental in the last years manual testing will combined resources) along with the lead engineering firm in Denmark (Tech-wise A/S) have been assigned to complete the design package for the proposed plant. Our firm has been selected to be the "engineer-of-record" for the project, and are

assisting Niels Kirkegaard (Tech-wise) with the design based on Iowa and other governing codes. Other members evolved in the development and review of the project are the National Renewable Energy Laboratory, (NREL) who represent the US Department of Energy, (DOE), Alliant Energy who owns the power plant and property that the switch grass system is to be placed. Alliant is also contracted to oversee the engineering contacts, and oversee compliance or focus on the goals of Chariton Valley RC&D. Chariton Valley RC&D are the founders of the project and also plan to have an active role in the future operation and success. Antares is another engineering firm contracted to work on air and other environmental systems compliance, work on truck delivery schedules and routes, and other miscellaneous engineering tasks.

The switch grass process:

The system will be designed and engineered for 25 tph, but initially tested at 12.5 tph for 2000 hours, then we plan to finish the equipment installation and test at the system at a combined rate of 25 tph. The process starts at supply where baled switch grass is harvested and delivered (from Prairielands Bioproducts Co-op) to the system from the South end of the existing coal plant and leaving to the North. When the tractor-trailers arrive the (1) crane operator receives the baled switch grass from Chariton Valley Co-op, offload from their tractor-trailers during the daylight hours (8-10 hours), store in a switch grass in the barn (enough for at least three day supply) all the while feeding into the process building. The bales will be manually unloaded one layer (up to 14 bales at once) at a time off the tractor-trailers by an overhead bridge crane. Once the operator locates the bridge crane over the truck and locates the arms to match the bale spacing, the load is then clamped and lifted vertically off the truck, then the programmed automation takes it from there. The manually clamping of the load with the bridge crane is done mainly for safety issues, but also for clean up and security issues. The expected minimum number of people in the barn is (1) during the daylight hours and up to (4) if four trucks are in the building. At night the bale feed system from the stored bales is totally automatic. As shown on the preliminary drawings and discussed the storage piles have been initially laid out at a maximum 45,000 cf. with 5 feet separation due to bale size differences.

The existing boiler operators will have monitoring cameras, access to the biomass feed controls, and monitor all smoke, fire, and temperature sensing alarms and gages. Again, the bales are unloaded in whole layers (12 or 14 at a time) off the tractor-trailers and loaded onto the bale transport conveyors or put in storage. This is done during daylight hours, during the night hours the crane runs automatically to load onto the transfer from the storage piles. This operation runs 24-7, but if required to be stopped for maintenance or other reasons the coal usage goes up to make up the difference. Once transported onto the transfer chains the bales travel through the gallery to the process building, where they are de-twined, debaled, de-stoned, shredded and blown into the existing coal boiler.

We also discussed that our office sees the construction type II-N, and the classification of the storage barn as H-3. We plan to limit the storage barn size to 45,000 sf. The switch grass storage barn is planned to be placed 60 feet clear of the processing building will have dry system down spouts with hose reels (6 locations). The hose reels will be at each corner of the building and one at each truck entrance. Fire extinguishers will be at the truck doors as well. Our intention is to use the existing fire hydrant system

for outside fire protection, sprinkle the process building along with other fire protection as in fire extinguishers, and the debaler will have fire water spray system. This type of fire protection system is similar to that of England and Denmark. It's similar to that of an Oregon storage facility where the state Fire Marshal required a 60-foot separation between the sprinkled process building and non-sprinkled storage barn.

As shown on the drawings we are proposing to have the transfer equipment from the storage barn to the process building in an enclosed gallery. This gallery will have a two-hour fire rated wall between, one load of 14-bales, and the other fire rated wall. As I mentioned we will modify the preliminary drawings to show these doors in the gallery section rather than the storage barn. The process or transferring the bales through the gallery is planned to always have one of the two fire doors in the fire rated walls to always be closed, while the other allows the transfer. Besides the process fire doors there will be fire rated man doors in these walls.

It's our understanding, based on the conversations with operators at five plants the team members visited in Denmark and England, and with the Denmark engineering firm, there has never been a fire in a storage barn. However in the event of the beginnings of a fire or noticed/detected smoke, the extinguishers and fire hoses inside the barn and available fire hydrants outside will be employed. The client and team members understand that the most likely source of ignition in the storage barn is due to trucks (which deliver in daylight hours). When smoke is noticed the truck driver and/or crane operator will first contact the plant control room, then will attempt to separate the source from other hazardous areas. If needed, operators will extinguish the source with the fire extinguishers, if further need arises they will employ the fire hoses. If unable to control even with the available plant fire personnel and fire department, they will leave the barn and protect the adjacent buildings. During non-delivery hours there will be cameras and fire sensing and alarm devices to give indication to the status of the barn and process building to the coal plant's control room (manned 24 hours a day).

Our current plan for the future fire system development will include fire hydrant testing (planned for this year), and further development of the fire system and specifications, when the final size and placement of the buildings are established. I had planned to talk to an insurance carrier the same day as our meeting, but apparently he wasn't able to make the meeting. I wanted to discuss his recommended sprinkler rate for the process building for a reasonable insurance coverage rate, then I planned to compare this with other facilities and decide based on the final processing building size and best (safe) sprinkler rate. The expected range is between 0.15 gpm/sf to 0.30 gpm/sf. When this discussion and decision occurs, we plan to present along with our proposed plans for examination and review.

Other discussion items:

We discussed the special inspections we require for the project, which include inspecting reinforcement placement, concrete placement, cast in place anchor bolts and weld pad placement, structural steel welding, and high strength bolting.

Other items are that we understand that the preferred method of contact is by email, and we plan to send in the final “issue for construction” drawings when available to your office. We also are aware of the fee for the plans examine starting at $200 and is based on square footage, and agree that this may need to be negotiated due the large size of building, yet used for storage and retrieval of switch grass.

I hope this captures our conversation as well as fills in some more background to our plans. Please let me know if I inadvertently left anything out.

In appreciation of your time,

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