

**THE DESIGN AND PRESENTATION OF MITIGATION MEASURES IN ENVIRONMENTAL  
IMPACT STATEMENTS FOR NON-REGULATORY AGENCIES: A CASE STUDY**

**Martin Schweitzer<sup>1</sup>**

**Robert L. Miller**

Oak Ridge National Laboratory  
Oak Ridge, Tennessee

**ABSTRACT**

The typical environmental impact statement (EIS) performed for non-regulatory agencies contains a description of mitigation measures that can be implemented to reduce or prevent impacts projected to result from a proposed major federal action. These mitigation measures typically are identified or designed by the analysts responsible for assessing potential impacts and preparing the EIS. Mitigation actions commonly are presented in the document as being "possible" or "proposed" or even "recommended," but in many cases they do not represent a firm commitment to action by the applicant or responsible federal agency. Because even significant impacts can often be mitigated, the presentation of possible mitigation measures in an EIS can make it appear that serious adverse effects would be avoided, even if the responsible party(ies) have made no commitment to implement the potential remedies. Such ambiguity can make it difficult for the public—and even the responsible federal agency—to evaluate the desirability of a proposed project.

This paper presents a case study of how analysts, the applicant, and the responsible federal agency interacted to identify and select mitigation measures and unambiguously present them in a recent EIS for a clean coal demonstration project in Jacksonville, Florida. Through the preparation of a preliminary draft EIS showing the projected severity of unmitigated impacts, the design of potential mitigation measures to address those environmental effects, and frequent communication among the parties involved concerning projected impacts and their available remedies, agreement was reached concerning the specific mitigation measures that the applicant would implement. These measures were listed in the EIS as being "agreed to" by the applicant, thereby giving the reader a clear idea of what would be done and what the resulting environmental effects would be in the event of project construction and operation.

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<sup>1</sup>Martin Schweitzer, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6206. Phone:865/576-2726. Fax:865/576-6661. E-mail:schweitzerm@ornl.gov.

## **BACKGROUND**

When a federal regulatory agency prepares an EIS, the final document generally specifies the terms and conditions under which the proposed project would be allowed. Often, these conditions are incorporated into a license or other legal instrument that allows the applicant to engage in a prescribed set of activities. Accordingly, the measures that must be taken to mitigate any adverse impacts that are identified through the environmental analysis are clearly specified. The entity that is applying to undertake a given action (the applicant) and the interested public are provided with the analysts' best prediction of how the environment would be affected if the project is constructed and operated in conjunction with specific mitigating actions.

In contrast, when a non-regulatory agency prepares an EIS, there is often more ambiguity surrounding the precise actions, if any, that would be taken to mitigate potential adverse environmental impacts associated with the proposed project. In some cases, the responsible federal agency is the proponent of a proposed project, as when it constructs a road segment or builds and operates some kind of demonstration facility. In those instances, the agency has the authority and autonomy to commit to a specific set of mitigation measures, although the situation can be complicated because the individuals engaged in the environmental analysis are often not the same people who make policy decisions or allocate funds. The situation can get even more complex when the responsible federal agency is providing funding to another entity (private sector company or state or local government) which would actually be responsible for project construction and operation. While the federal agency involved in this kind of project would certainly have the authority to establish the terms under which it would allow the project to go forward, it would have to rely on its "partner" in the project to implement any mitigation measures that might be necessary. And, once again, the staff members responsible for identifying prospective impacts and designing appropriate mitigation strategies are often not the same individuals who will decide whether, and under what circumstances, to proceed with the proposed project.

In light of the above discussion, it is not surprising that the EISs prepared by non-regulatory agencies, especially when a nonfederal partner is involved, have often discussed impact mitigation in terms of what "could" be done rather than what "will" be done if the project proceeds. In one such document that one of the authors helped prepare a number of years ago, it was noted that potentially severe traffic congestion could occur on two local roadways as a result of the influx of workers during construction of the proposed

project. As is often the case, measures were available to mitigate these impacts (e.g., widening key segments of the roads in question, instituting a park-and-ride system, encouraging car pooling) and they were described in detail in the EIS. The document concluded that there were several measures that could be taken to mitigate potential impacts and that the responsible federal agency, in cooperation with the state department of transportation, would implement mitigation measures to ensure, to the extent practicable, that traffic would not exceed acceptable levels in the project area. The precise measures that would be implemented were not specified.

This example points out a common problem with the way potential mitigation measures are often presented in EISs prepared by non-regulatory agencies. Because most adverse environmental impacts can be reduced or avoided by some type of well-designed mitigation program, the reader can be left with the impression that the environment will not be adversely affected by proceeding with the project. In fact, it is often the case that, even though the knowledge and technology exist to engage in a project without incurring unacceptable environmental consequences, the same project could result in substantial environmental harm if undertaken without adequate mitigation measures. For this reason, we believe that it is extremely important for EISs to clearly establish not only what *could* be done but also what *will* be done to mitigate potential adverse impacts if the project proceeds. If an EIS is to be an accurate disclosure document as well as an effective tool to aid in environmental decision making, it must clearly state what the impacts would be in the presence of the actual mitigation measures that will be implemented.

The remainder of this paper presents a description of the process by which one EIS evolved, through successive drafts, from a document where the actual mitigation measures to be implemented (and hence the associated environmental impacts) were unclear to a document in which the applicant agreed to implement a specific set of mitigative actions and the impacts associated with that situation were clearly presented. This EIS was prepared for the Circulating Fluidized Bed Combustor Project, a clean coal demonstration project involving the U.S. Department of Energy (DOE), the agency responsible for preparing the EIS, and JEA (formerly the Jacksonville Electric Authority), a municipal utility located in northeast Florida.

#### **JEA CIRCULATING FLUIDIZED BED COMBUSTOR PROJECT: A BRIEF DESCRIPTION**

The Circulating Fluidized Bed Combustor Project represents a large-scale demonstration of an innovative technology for burning coal to generate electricity. JEA proposed constructing and operating a new

combustor unit that would use bituminous coal and petroleum coke to drive an idle steam turbine and generate almost 300 MW of electricity at its Northside Generating Station in Jacksonville, Florida. The Northside Generating Station sits on a 400-acre industrial site inside the city limits, approximately nine miles northeast of downtown Jacksonville. Land use in the area is mixed, containing industrial, commercial, residential, and agricultural parcels. The plant is located very close to the north shore of the St. Johns River, and there are substantial wetlands in the vicinity.

In a cost-sharing agreement, JEA would pay approximately three-fourths of the costs of the Circulating Fluidized Bed Combustor Project, while DOE would provide the remaining quarter of the funds under the federal Clean Coal Technology Program. Because providing this funding would constitute a "major federal action that may significantly affect the quality of the human environment," an EIS was prepared under the National Environmental Policy Act (NEPA). Staff at Oak Ridge National Laboratory (ORNL) assisted DOE in preparing this document.

As in all NEPA documents, a variety of important environmental topics were examined by the analysts, including impacts to air quality, water resources, geology, terrestrial and aquatic ecology, socioeconomics, transportation, noise, and cultural resources. The potential for significant impacts in a few of these subject areas led to the design of targeted mitigation actions and a subsequent effort—involving analysts, applicant, and responsible federal agency—to present key information in the EIS so that projected impacts would be clear to all concerned parties and well-informed decision making would be facilitated.

## **THE EVOLUTION OF AN ENVIRONMENTAL IMPACT STATEMENT**

ORNL staff began collecting the data necessary for preparation of an EIS on the Circulating Fluidized Bed Combustor Project in late 1997. Work progressed steadily over the next 20 months, during which time four consecutive versions of a Preliminary Draft EIS (PDEIS) were written, each one building on the previous one and reflecting the interactions among DOE, ORNL, and JEA. The ways in which each version dealt with the mitigation of potential adverse impacts and how this treatment changed over time are discussed in more detail below. Specifically, four key issues were identified that will be the focus of the following discussion: (1) possible impingement or entrainment of free-swimming aquatic organisms in intake grids; (2) potential loss of archaeological resources during project excavation; (3) possible traffic congestion during the construction period; and (4) intense noise as a result of steam blowouts (a procedure in which the

facility's steam lines are cleared of debris by blowing them out with steam) and the operation of pile drivers.

### **First PDEIS (June 1998)**

In June 1998, a first PDEIS was completed and sent to appropriate DOE staff members for review. This document (DOE, June 1998) discussed the proposed action and alternatives, described the existing environment for a number of different resources, and predicted the environmental consequences of the proposed project and the no action alternative. This first draft made it clear that the Circulating Fluidized Bed Combustor Project could lead to adverse environmental impacts in several areas.

This first PDEIS noted that the recent introduction of finer mesh intake screens could result in the screens becoming more easily clogged, thereby increasing the vulnerability of free-swimming aquatic organisms to impingement. No mitigation measure was identified in this document, but it was suggested that the situation be closely monitored "until a more effective and permanent design can be established."

Because the area in the vicinity of the Northside Generating Station is rich in archaeological resources, this PDEIS stated that any excavation of undisturbed land had the potential to adversely affect important artifacts. The document went on to recommend that JEA conduct an archaeological survey of any previously-undisturbed land prior to its excavation in order to prevent such impacts.

In the section on transportation, this PDEIS pointed out that the lack of a traffic light at the main entrance to the Northside plant could result in traffic congestion during the construction period. Accordingly, it was suggested that JEA monitor conditions at the main entrance and work with appropriate government agencies to install a traffic light if needed to relieve congestion.

Regarding potential noise impacts, the document identified two potential sources of extremely loud noise: pile driving during construction and steam blowouts at the end of the construction period and at infrequent intervals during operations. No measures were suggested to mitigate the noise associated with pile driving, but it was noted that the effects of steam blowouts on nearby residents could be lessened if these individuals were inside their homes during the blowouts or if work crews directed the noise away from the nearest residences. The PDEIS stated that, without mitigating strategies, noise from these sources could violate the local noise pollution ordinance.

While possible monitoring and mitigation measures were suggested in response to a number of the adverse impacts identified in the first PDEIS, no indication was given as to whether the applicant would implement any of these actions.

### **Second PDEIS (December 1998)**

In December 1998, a revised PDEIS was prepared (DOE, December 1998), taking into account reviewer comments on the first version. This new document exhibited several important changes in its treatment of the four key issues discussed above.

For the issue of impingement or entrainment of free-swimming aquatic organisms at the intake screens, the revised PDEIS continued to recommend that the situation be closely monitored. This document departed slightly from the earlier version by explicitly recommending that mitigation measures be established if impacts are observed, but it did not specify what those measures should be.

The discussion of archaeological resources was unchanged and this document continued to recommend that JEA conduct an archaeological survey of any previously-undisturbed land prior to its excavation in order to prevent potential impacts.

The transportation analysis was revised, based on a new report prepared by transportation consultants hired by JEA, to upgrade the possible severity of traffic congestion at the plant's main entrance and put more emphasis on the need for a traffic signal at that location during the construction period. The revised PDEIS also discussed the possibility of severe impacts on another road segment, again based on information provided in the report by JEA's consultants. Several possible mitigation measures to lessen the severity of impacts on that segment were suggested, such as encouraging car and van pooling and encouraging workers to use alternate routes.

As in the previous iteration, no measures were suggested to mitigate the noise associated with pile driving. However, several additional mitigation measures to address the noise from steam blowouts were described, such as notifying local residents in advance of such events and permitting blowouts only during the daytime. It was stated that JEA was committed to taking those actions, which would be consistent with current operating practices at its other generating units.

While the second PDEIS contained some important new information, nearly all of the mitigation measures discussed were still treated as

*recommendations* by the analysts rather than as firm commitments to action by the applicant. The single exception was that JEA would implement a set of measures, consistent with actions already taken at its other generating units, to mitigate the adverse noise impacts of steam blowouts.

Once again, the PDEIS was sent to appropriate DOE staff members for review.

### **Third PDEIS (March 1999)**

Although the first two versions of the PDEIS suggested mitigation measures that *could* be taken to lessen environmental impacts, with one exception (noted above) those documents did not express a commitment by the applicant to take such actions. Therefore, the possibility existed that the applicant could construct and operate the proposed facility without taking most of the actions that were recommended by the analysts, leading to impacts that would be considerably more severe than those that would occur if all the suggested mitigation measures were implemented. Accordingly, a third version of the PDEIS was prepared and sent to DOE reviewers that discussed only those mitigation measures to which the applicant had already committed (DOE, March 1999). In all other cases, the potential impacts presented were those that were considered likely to occur in the absence of mitigation.

The discussion of impingement or entrainment of free-swimming aquatic organisms in this version of the PDEIS explained the vulnerability of these animals without discussing how potential impacts could be ameliorated.

The discussion of cultural resources continued to note the possibility for adverse impacts to archaeological resources, but it dropped the recommendation that JEA conduct an archaeological survey of previously-undisturbed land prior to any excavation. However, this version of the PDEIS did add a paragraph explaining that existing regulations would require JEA to notify the appropriate state agencies if any archaeological artifacts were discovered during construction-related activities.

The transportation section noted that significant impacts could occur at the two potential problem spots identified in the previous iteration but did not discuss any of the possible actions that could be taken to mitigate them.

As in the previous version of the PDEIS, this document continued to describe mitigation measures that the applicant had committed to take

to reduce the noise impacts from steam blowouts. In addition, this PDEIS described specific measures that JEA would take to reduce the noise associated with its pile driving.

With the exception of noise impacts, where the applicant committed to a new mitigation measure, the treatment of key issues in this document did not include a discussion of possible mitigative actions. Therefore, the severity of potential impacts in most subject areas appeared to be greater than in earlier versions of the PDEIS.

#### **Fourth PDEIS (June 1999)**

At approximately the same time that the third PDEIS was being completed, ORNL analysts prepared a list of recommended mitigation measures to address key impacts and sent it to the DOE project manager at FETC. This list showed what could be done to mitigate the adverse impacts described in the PDEIS. DOE, in turn, sent this list of recommended mitigation measures to JEA. Subsequently, JEA agreed to implement most of the remedies suggested in ORNL's list. In June 1999, a fourth PDEIS (DOE, June 1999) was prepared and sent to DOE reviewers. This document discussed all of the mitigation measures to which JEA had committed.

To minimize the adverse impacts of impingement or entrainment of free-swimming aquatic organisms, this version of the PDEIS stated that JEA would regularly monitor the incidence of clogging at the plant's intakes and increase the frequency of cleaning, if necessary.

The discussion of archaeological resources included a statement that JEA would conduct an archaeological survey of the construction area prior to initiating any excavation.

The transportation section noted that JEA had agreed to encourage car pooling, to suggest alternate routes for workers traveling to and from the site, to monitor traffic at the main entrance to the plant, and to pursue installation of a temporary traffic signal, if necessary.

Like the previous versions of the PDEIS, this one also presented a set of mitigation measures to which the applicant had committed in order to reduce the noise impacts from steam blowouts and pile driving. However, this version contained an additional measure to mitigate noise impacts associated with blowouts.

This version of the PDEIS clearly showed the mitigation measures to which the applicant had committed and the magnitude of impacts projected to occur in the presence of those mitigative actions.

## **Draft EIS (August 1999)**

Based on reviewer comments, the document was revised once more and a Draft EIS was released for public review in August 1999 (DOE, August 1999). Like the previous document, this one clearly showed all of the mitigation measures to which JEA had committed and discussed the impacts expected to occur in the presence of those measures. The discussion of impacts and mitigation measures in the key issue areas was essentially unchanged from the last version of the PDEIS.

## **CONCLUSIONS**

Most adverse impacts identified by environmental analysts in the preparation of NEPA documents can be minimized or avoided through the adoption of appropriate mitigation measures. However, in the absence of such mitigation, impacts can at times be quite severe. A common problem with EISs prepared by non-regulatory agencies is that they often suggest possible mitigation measures without specifying whether or not the responsible party has committed to implementing them. This can lead to confusion by the public, and even the responsible federal agency, concerning the actual magnitude of the impacts associated with the proposed project. Therefore, it is our position that an EIS should clearly establish what *will* be done to mitigate potential adverse impacts if the project proceeds rather than what *could* be done. To serve as an adequate public disclosure document and aid federal agencies in their decision making, an EIS must describe what actions, if any, project applicants have agreed to take to mitigate potential adverse effects and clearly describe the magnitude of the impacts that are likely to occur in the presence of those actions.

## **REFERENCES**

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