

DECISION NOTICE AND FINDING OF NO SIGNIFICANT IMPACT

Aspen Free-Air Carbon Dioxide and Ozone Enrichment Facility Infrastructure Upgrades

U.S.D.A. – Forest Service, North Central Research Station
Harshaw Research Farm, Oneida County, Harshaw, Wisconsin

1.0 INTRODUCTION

This Decision Notice (DN) and Finding of No Significant Impact (FONSI) documents my decision to implement infrastructure upgrades needed for continuation of research on carbon dioxide and ozone enrichment on trees in 12 experimental rings that comprise the Aspen FACE User Facility.

An Environmental Analysis (EA) addressed the direct, indirect, and cumulative impacts that would result from implementing the proposed action and the no action alternative. The EA also included the necessary supporting information for a management decision to prepare either an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI). The key areas of potential concern that were addressed were impacts to air quality, noise, ecology, human health and safety, socioeconomics, environmental justice, and visual resources in the region of interest. I have weighed the potential risks and benefits from the proposed action and alternative.

2.0 DECISION

On the basis of the information and analysis in the final *Environmental Assessment for the Aspen Free-Air Carbon Dioxide and Ozone Enrichment Facility Infrastructure Upgrades* at Harshaw, Wisconsin, it is my determination that adoption of the proposed action would not constitute a major federal action that would significantly affect the quality of the human environment, considering the context and intensity of impacts (40 CFR 1508.27). Therefore, an Environmental Impact Statement (EIS) is unnecessary and will not be prepared.

1. Rationale for the Decision

In April 2006, the North Central Research Station of the U.S. Department of Agriculture Forest Service (USFS) issued a final Environmental Assessment (EA) for the Aspen Free-Air Carbon Dioxide and Ozone Enrichment Infrastructure Upgrades at the Harshaw Research Farm, Harshaw, Wisconsin, in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and state laws and regulations. The proposed action would involve continued site operation, installation of taller vertical carbon dioxide and ozone fumigation pipes and support poles for the vertical fumigation pipes, and raising the walkways in the experimental rings to facilitate researcher access to the tree canopies. Carbon dioxide and ozone fumigation

levels would increase by about ten percent annually under the proposed action. Under the no action alternative, proposed infrastructure modifications would not be made, but research would continue at the facility.

The EA addressed the direct, indirect, and cumulative impacts that would result from implementing the proposed action and the no action alternative. The EA also included the necessary supporting information for a management decision to prepare either an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI). The key areas of potential concern that were addressed were impacts to air quality, noise, ecology, human health and safety, socioeconomics, environmental justice, and visual resources in the region of interest.

2. Purpose and Need for Federal Action

The purpose of the proposed action would be to implement infrastructure upgrades needed for continuation of research on CO₂ and O₃ enrichment on trees in 12 experimental rings that comprise the Aspen FACE User Facility. The Aspen FACE project is part of the North Central Research Station's mission of evaluating the potential effects of global atmospheric change on forest ecosystems and the U.S. Department of Energy (DOE) mission of evaluating climate change as part of its Program for Ecosystem Research.

The North Central Research Station is one of seven research and development units of the USFS. Forest Service research and development scientists carry out basic applied research to study biological, physical, and social sciences related to diverse forests and rangelands. The North Central Research Station participates in research that is part of national programs such as the ongoing Forest Inventory and Analysis as well as specialized research.

The Aspen FACE experiments are multidisciplinary studies that assess the effects of increasing CO₂ and O₃ concentrations on forest ecosystems. The research is collaborative and multinational involving scientists from the United States, Canada, Slovakia, Finland, and Estonia.

Current experiments are underway that focus on the following areas:

- Tree physiology effects – the study of plant productivity, carbon balance and allocation, and photosynthesis responses to elevated CO₂ and O₃;
- Effects on insects and microbes – how the change in nutrient quality of tree leaves grown in the presence of elevated CO₂ and O₃ will impact organisms that feed on and decompose those leaves;
- Effects on soil processes and nutrient cycling;

- Meteorology effects – the characterization of the microclimate both within and outside the 12 rings; and
- Ecosystem effects – how changes in plant productivity affect water and nutrient cycles.

Of particular concern for the EA were the potential impacts of chemical releases to air from the FACE facility, and particularly O₃ releases. O₃ is an oxidizing molecule that, above certain concentrations, causes damage to human health (respiratory system damage) and to vegetation (photosynthesis and metabolic function disruption). O₃ occurs naturally in the stratosphere, and is occasionally transported downward into the troposphere (lower atmosphere, near ground level). It is naturally produced in the troposphere by lightning. O₃ is also produced in the troposphere by reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight, and its peak concentrations normally occur during summer months characterized by high temperatures and intense solar radiation. NO_x comes primarily from the combustion of fossil fuels, such as oil, coal, and natural gas. By far the largest source of NO_x is motor vehicle exhaust and secondarily fuel combustion (e.g., electric power plants). Major sources of VOCs are motor vehicle exhaust, solvents and paints, petrochemical industries, and agriculture.

Ground-level O₃ is considered to be air pollution; O₃ is regulated as a criteria pollutant (that is, one that all regions of the country must keep below regulatory levels) by the U.S. Environmental Protection Agency (EPA). Of key importance in the EA was an examination of whether, under the proposed action, O₃ emitted from the FACE facility would travel beyond the site boundary at concentrations higher than concentrations of concern for adverse impacts to human health or vegetation. Although emissions of CO₂ are not of such high concern because it is far less hazardous than O₃, CO₂ emissions were also addressed.

3. Description of the Proposed Action

In 1996, the Michigan Technological University received approvals from the U.S. Department of Energy (DOE) and the Forest Service to construct and operate a research facility near Harshaw, Wisconsin, that could evaluate the effects of elevated levels of carbon dioxide (CO₂) and ozone (O₃) on native tree species common in the upper Midwest. The experimental facility, known as the Aspen Free-Air Carbon Dioxide and Ozone Enrichment User Facility (Aspen FACE), was constructed in 1996 and became operational in 1998. The main features of the site include 12 experimental rings, a main laboratory and computer building and various equipment buildings and sheds, and liquid CO₂ and oxygen storage tanks. As part of its Program for Ecosystem Research, the DOE Office of Science has approved continued funding for the Aspen FACE project from April 1, 2005 to March 31, 2008.

The original experimental design allowed researchers to analyze the effects of elevated CO₂ and O₃ on trembling aspen (*Populus tremuloides*), paper birch (*Betula*

papyrifera), and sugar maple (*Acer saccharum*), by fumigating the trees with measured amounts of CO₂ and O₃. The DOE approved a categorical exclusion for the FACE project in 1996, indicating that the project would not have a significant effect on the human environment. During the nine years of experiments since that time, trees in some rings have grown to the top of the vertical fumigation pipes, making it difficult if not impossible to continue experiments in the tree canopies without infrastructure upgrades.

The proposed action would involve continued site operation, installation of taller vertical fumigation pipes and support poles for the vertical fumigation pipes, and raising the walkways in the experimental rings to facilitate researcher access to the tree canopies. Currently experiments are carried out in twelve 30-m (98-ft) diameter rings. New vertical fumigation pipes would be installed to adjust the fumigation height as necessary due to tree growth. First, an additional 5-m (16-ft) extension of the vertical fumigation pipes would be erected that would allow experiments to continue for an additional 5 to 6 years. A second 5-m (16-ft) extension of the fumigation pipes would be needed after that time to allow continuation and completion of the experiments during the planned life of the research facility. The current height of support poles is 10 m (33 ft); the fumigation pipes extend to about 11 m (36 ft). The new installed vertical support poles would be long enough to allow the full extension of 10 m (33 ft).

4. Impacts

Although there are some minor and temporary adverse impacts associated with construction at the site, these impacts would not be significant. Ozone emissions from site operations would not cause exceedance of air quality standards. Infrequent elevated ozone concentrations (due largely to elevated background ozone concentrations that are unrelated to site-operations) could cause leaf damage to some plants, but decreased crop yields are not expected. If an individual with particular sensitivity to ozone spent several hours near the site fence line on one of the infrequent days with an elevated ozone level, that person could experience some respiratory discomfort. From 84% to 96% of these possible occurrences of ozone effects on human health would be due solely to background, non-site sources. Site emissions contribute less than 5% to the exceedance when an exceedance occurs due to a combination of background and site emissions. The incidence of such an adverse health impact on an individual is expected to be very low, if it occurs at all. No adverse health impacts due to site emissions would be seen at actual residential locations under either the proposed action or no action alternatives.

This EA concluded the proposed action and no action alternative for the FACE site would result in minimal or no adverse impacts to air quality, noise, ecology, human health and safety, socioeconomics, environmental justice, and visual resources.

The main impacts studied are tabulated in Table 1 for the proposed action and no action alternatives. Other information bearing on impacts of the proposed action is contained in the final EA.

TABLE 1. Impacts of the Proposed Action and No Action Alternatives at Aspen FACE Site

Impact Area	Impacts of Proposed Action	Impacts of No Action (Continued Site Operations)
Air Quality	<p><u>Construction:</u> Insignificant and temporary increase in engine exhaust and fugitive dust emissions.</p> <p><u>Operations:</u> Increase in emissions of O₃, but no exceedance of 1-hour or 8-hour standards. Increase in emissions of CO₂, but negligible impact on global warming.</p>	<p><u>Construction:</u> Not applicable.</p> <p><u>Operations:</u> CO₂ and O₃ emissions unchanged from current levels. No exceedance of standards.</p>
Noise	<p><u>Construction:</u> Temporary minor impact near the fence line; negligible impact at nearest residences.</p> <p><u>Operations:</u> Below EPA guidelines for residential zones at the site fence lines; negligible impact at nearest residences.</p>	<p><u>Construction:</u> Not applicable.</p> <p><u>Operations:</u> No increase above current levels.</p>
Ecology	<p><u>Construction:</u> Minimal and non-measurable impacts.</p> <p><u>Operations:</u> No or minimal impacts to animal populations. Possible minimal damage to plant leaves from a low incidence of O₃ levels exceeding the damage threshold at adjacent offsite areas (70% of the O₃ exceedances are due solely to background, non-site sources); damage insufficient to cause decreased crop yields. No impacts to threatened and endangered species or species of concern. No impacts to wetlands or floodplains.</p>	<p><u>Construction:</u> Not applicable.</p> <p><u>Operations:</u> No or minimal impacts to animal populations. Possible minimal damage to plant leaves from a low incidence of O₃ levels exceeding the damage threshold at adjacent offsite areas (87% of the O₃ exceedances are due solely to background, non-site sources); damage insufficient to cause decreased crop yields. No impacts to threatened and endangered species or species of concern. No impacts to wetlands or floodplains.</p>
Human Health	<p><u>Construction:</u> Minimal impacts.</p> <p><u>Operations:</u> Possible infrequent days that a hypothetical sensitive individual located at the fence line would experience respiratory discomfort (84% of O₃ exceedances are due solely to background, non-site sources). No impacts at existing residential locations.</p>	<p><u>Construction:</u> Not applicable.</p> <p><u>Operations:</u> Possible infrequent days that a hypothetical sensitive individual located at the fence line would experience respiratory discomfort (96% of the O₃ exceedances are due solely to background, non-site sources). No impacts at existing residential locations.</p>
Socioeconomics	<p><u>Construction:</u> Create 4 temporary jobs, about \$0.3 million in income.</p> <p><u>Operations:</u> Sustain 7 direct jobs, 5 indirect jobs, about \$0.3 million income annually.</p>	<p><u>Construction:</u> Not applicable.</p> <p><u>Operations:</u> Sustain 7 direct jobs, 5 indirect jobs, about \$0.3 million income annually.</p>
Environmental Justice	<p>No high and adverse impacts to minority or low income populations.</p>	<p>No high and adverse impacts to minority or low income populations.</p>

Table 1 (Continued)

Impact Area	Impacts of Proposed Action	Impacts of No Action (Continued Site Operations)
Visual Resources	Increased visibility of structures from roads adjacent to the site. Appearance consistent with existing conditions. Minimal impacts.	No change from existing conditions.
Cumulative Impacts	Minimal impacts.	Minimal impacts.

3.0 ALTERNATIVES CONSIDERED

Under the no action alternative, proposed infrastructure modifications would not be made, but research would continue at the facility. In order to accomplish this, there would be two possibilities: (1) continue to operate even though the vent heights would not allow optimal fumigation, especially in the CO₂ rings where the trees are the tallest; or (2) remove the existing trees in the rings and replant (with the same species or with other species for which research data on the effects of CO₂ and O₃ are needed). This latter possibility would require disposal of the wood from the current trees in the rings and modification of the heights of the vents in the vertical vent pipes. It also would mean that the amount of CO₂ and O₃ emitted would be maintained at levels similar to current levels or less. For this assessment, it is assumed that emissions would remain at current levels under the no action alternative, and that the current trees in the rings will not be removed.

4.0 PUBLIC INVOLVEMENT

The Scoping Report, referenced in the EA, and included in the Project Record, contains details of the public participation on this project. To date, the public has been invited to participate in the Aspen Free-Air Carbon Dioxide and Ozone Enrichment Facility Infrastructure Upgrades project in the following ways.

1. Scoping Notice and Postings.

Public scoping meetings and tours of the existing Aspen FACE Project Facility took place on June 15, 2005. Notices of the public meetings were published in the *Rhineland Daily News*, the *Vilas County News Review*, and the *Lakeland Times*. In the newspaper notices and at the public meetings, the Forest Service informed the public of the various ways to submit comments, and that comments would be received until July 12, 2005.

The main concerns raised at the public meetings and in written comments were about the human health effects from exposure to elevated ozone levels that may be transported beyond the Aspen FACE site. Other concerns involved ozone effects

beyond the fence line on agricultural crops, particularly potatoes; noise; and safety issues related to storing and unloading gases at the site.

2. Public Review and Comment on the Environmental Assessment.

On January 11, 2006, copies of the draft Environmental Assessment (EA) were mailed to persons who had attended the public scoping meeting for the facility infrastructure upgrades in June 2006. Additionally, a notice that the assessment was available was sent to six Rhinelander area media outlets (including newspapers and television). The document was also made available through the U.S. Forest Service Aspen Free-Air Carbon Dioxide and Ozone Enrichment Facility (FACE) EA Expansion Project homepage http://www.ncrs.fs.fed.us/projects/face_ea/. Interested parties were requested to provide comments on the EA to the Forest Service by February 9, 2006. On February 8, the public comment period was extended through March 2 in order to allow interested individuals and organizations additional time to comment on the proposed action and other alternatives prior to a decision being made by the Responsible Official. A notice of extension of the comment period was again sent to the Rhinelander area media outlets.

Ten comments on the draft EA were received; four separate comments from a single individual, four from other individuals, and two from regulatory agencies with oversight on FACE facility operations. The comments dealt with a variety of issues including the reliability of the model used to estimate ozone dispersion from the release points, and the potential for adverse health impacts from site-related ozone.

5.0 FINDING OF NO SIGNIFICANT IMPACT

In consideration of the analysis documented in the final EA and the reasons below, implementation of the proposed action would not constitute a major federal action that would significantly affect the quality of the human environment. Therefore, an Environmental Impact Statement (EIS) will not be prepared. This determination is based on the following reasons:

1. The Forest Service has thoroughly evaluated both the beneficial and adverse effects (40 CFR 1508.27(b)(1) of the proposed action and found them to be without significant impact.
2. The proposed action will not significantly affect public health or safety (40 CFR 1508.27(b)(2).
3. The proposed action will not significantly affect any unique characteristics of the geographic area (40 CFR 1508.27(b)(3). Similarly, it will not adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or cause loss or damage to objects listed in or eligible for listing in the National Register of Historic Places (40 CFR 1508.27(b)(8).
4. The proposed action will not involve effects to the quality of the human environment that are likely to be highly controversial (40 CFR 1508.27(b)(4); ie.,

scientific controversy regarding the identification or extent of potential environmental impacts.

5. The proposed action will not impose highly uncertain risks or involve unique or unknown risks (40 CFR 1508.27(b)(5)).
6. The proposed action will not establish a precedent for future actions with significant effects and does not represent a decision in principle about a future consideration (40 CFR 1508.27(b)(6)).
7. The proposed action is not related to other actions with individually insignificant but cumulative significant impacts (40 CFR 1508.27(b)(7)).
8. The proposed action will not adversely affect threatened or endangered species or habitats that have been determined to be critical under the Endangered Species Act (40 CFR 1508.27(b)(9)).
9. The proposed action does not threaten to violate federal, state, or local laws or requirements imposed for the protection of the environment (40 CFR 1508.27(b)(10)).

6.0 FINDINGS REQUIRED BY OTHER LAWS AND REGULATIONS

1. National Historic Preservation Act of 1966

The occurrence of intact archaeological remains at the FACE site is considered unlikely because the soils of the site have been extensively disturbed. From the 1920s until the mid-1970s when the Forest Service purchased the property, the site was used as a potato farm. Construction of the FACE facility further disturbed the soils of the site. The buildings on the site are less than 50 years old and not of historic interest, and do not meet criteria for listing on the National Register of Historic Places.

In preparing the EA for the proposed Harshaw Field Laboratory building on the FACE site, the Forest Service consulted the national Register to determine if any nearby Federally or state-listed historic sites or districts would be impacted by the proposed project. The nearest listing was more than 16 km (10 mi) away.

2. Executive Order 11990, Protection of Wetlands

All federal agencies are directed to avoid, minimize, and compensate for impacts to wetlands from proposed projects. According to Oneida County, no wetlands, floodplains, or surface waters exist on or adjacent to the FACE facility; however, a small depression north of the FACE facility entrance has saturated soil during wetter periods of the year. Construction does not involve this area. Therefore, the proposed project is consistent with this executive order.

3. Endangered Species Act

The Forest Service contacted the U.S. Fish and Wildlife Service (FWS) in July 2005 to request a list of threatened and endangered species that could occur on an in the

vicinity of the FACE site. FWS responded with a list of species known from Oneida County and stated that no federally listed threatened or endangered species or designated critical habitat are known to exist on the site. A biological evaluation of the FACE site was performed by the Forest Service for the Harshaw Field laboratory EA to determine the occurrence of any federally or state-protected threatened or endangered plant species or suitable habitat on the site. That evaluation determined that potentially suitable habitat for 5 plant, 3 invertebrate, 12 bird, and 5 mammal species was present within 0.8 km (0.5 mi) of the site. None of these species or their habitats is known to occur on the FACE site.

4. Clean Air Act

The Aspen FACE site was exempted from permitting requirements by the Wisconsin Department of Natural Resources (WDNR) under the provision that sources will not violate or exacerbate a violation of the air quality standard or ambient air increment, so the site does not have an air quality permit. Most of the site is covered with grasses, and tall trees, so fugitive dust emissions caused by wind erosion and mobile equipment are minimal.

The Wisconsin State Ambient Air Quality Standards for six criteria pollutants are identical to the National Ambient Air Quality Standards (NAAQS) with a few exceptions. The only criteria air pollutant of potential concern for the FACE site is O₃. The Aspen FACE site is located in Oneida County, Wisconsin. Oneida County is currently an attainment area for all criteria pollutants (indicating it meets the standards).

Currently, O₃ is the only criteria pollutant that is regularly monitored at the Aspen FACE site. Based on the monitoring data, concentrations levels for all criteria pollutants around the Aspen FACE site are less than 91% of their respective NAAQS. The concentration of O₃, whose formation and transport is a regional issue, is close to its standard.

Since the site is not a major air emissions source, prevention of significant deterioration (PSD) regulations (40 CFR 52.21) is not applicable.

5. Noise Control Act of 1972

The State of Wisconsin and Oneida County where the Aspen FACE site is located have no quantitative noise-limit regulations. The proposed project is consistent with the goals, objective, and requirements of the Noise Control Act. Noise would not be significantly affected by the proposed project.

6. Executive Order 12898, Environmental Justice

This executive order requires that all federal agencies shall make achieving environmental justice part of their missions by identifying and addressing, as

appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States.

As construction and operation of the FACE facility would not have any high and adverse impacts on the general population in Oneida County, the facility would not affect minority and low-income populations in the county, and would therefore have no impact on environmental justice.

7.0 IMPLEMENTATION DATE

Implementation of this decision may occur on or after the 15th business day following the date of the last appeal disposition.

8.0 ADMINISTRATIVE REVIEW OR APPEAL OPPORTUNITIES

This decision is subject to administrative review (appeal) pursuant to 36 FR Part 215. Individuals or organizations that submitted substantive comments during the comment period specified at 215.6 may appeal this decision. The notice of appeal must be in writing, meet the appeal content requirements at 215.14, and be filed with the Appeal Deciding Officer:

Michael Rains
Acting Station Director
North Central Research Station
11 Campus Blvd.
Newtown Square, PA 19073
E-mail: appeals-ea-ncrs@fs.fed.us
Fax: 610-557-4095

Anyone who appeals must provide the Station Director sufficient narrative evidence and argument to show why the decision by the Project Leader should be remanded or reversed. At a minimum, the notice of appeal must:

1. State that it is an appeal pursuant to 36 CFR 215.
2. List the name and address of the appellant and, if possible, a phone number.
3. Identify this decision, the NCRS “Aspen Free-Air Carbon Dioxide and Ozone Enrichment Facility Infrastructure Upgrades Environmental Assessment”, the date it was signed, and the decision maker, Neil D. Nelson, Project Leader.
4. Identify the change or changes in the decision that the appellant seeks, or the portion of the decision to which the appellant objects.
5. State how the decision fails to consider comments previously provided, either before or during the comment period specified in 36 CFR 215.6, and, if applicable, how the appellant believes the decision violates law, regulation, or policy.

The Notice of Appeal, including attachments, must be filed (regular mail, fax, e-mail, express delivery, or messenger service) with the Appeal Deciding Officer at the correct location within 45 calendar days of publication of the legal notice of this decision in the *Rhineland Daily News*. The publication date in the newspaper of record is the exclusive means for calculating the time to file an appeal. Those wishing to appeal this decision should not rely upon dates or timeframe information provided by any other source.

Appeals submitted electronically, including attachments, must be in an electronic format compatible with Microsoft Word.

Hand delivered appeals will be accepted at the Station Headquarters, 11 Campus Blvd., Newtown Square, PA during normal business hours (8:00 am through 4:30 pm) Monday through Friday, excluding holidays.

9.0 CONTACT PERSON

Copies of the Environmental Assessment, and information on the Environmental Assessment and Decision Notice, can be obtained from Rick Sindt at (651) 649-5120, email: rsindt@fs.fed.us. The Environmental Assessment and Decision Notice are also available on the internet at: <http://www.ncrs.fs.fed.us/>.

10.0 SIGNATURE AND DATE

Neil D. Nelson
Project Leader, North Central Research Station
USDA Forest Service

Date