

**DOE/EA-1725**

**FINAL ENVIRONMENTAL ASSESSMENT**

**For  
SBE, Inc.**

**Electric Drive Vehicle Battery and Component  
Manufacturing Initiative Application  
Power Ring Manufacturing Scale-up**

**Barre, Vermont**



**April 2010**

**U.S. DEPARTMENT OF ENERGY  
NATIONAL ENERGY TECHNOLOGY LABORATORY**

## TABLE OF CONTENTS

LIST OF TABLES .....	iii
LIST OF FIGURES .....	iii
ACRONYMS AND ABBREVIATIONS .....	iv
1.0 INTRODUCTION .....	1
1.1 Background .....	1
1.2 Purpose and Need for DOE Action .....	2
1.3 Legal Framework .....	2
2.0 PROPOSED DOE ACTION AND ALTERNATIVES .....	7
2.1 SBE’s Proposed Project .....	7
2.2 Alternatives .....	10
2.3 No-Action Alternative .....	10
2.4 Comparison of Impacts .....	10
2.5 Issues Considered But Dismissed from Further Analysis .....	12
3.0 THE ENVIRONMENTAL ANALYSIS APPROACH .....	15
3.1 Approach to the Analysis .....	15
3.2 Analysis of Significance .....	15
4.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS .....	18
4.1 Air Quality .....	18
4.1.1 Description .....	18
4.1.2 Effects of SBE’s Proposed Project .....	18
4.1.3 Effects of No-Action .....	20
4.1.4 Cumulative Effects .....	20
4.2 Geology and Soils .....	20
4.2.1 Description .....	20
4.2.2 Effects of SBE’s Proposed Project .....	21
4.2.3 Effects of No-Action .....	22
4.2.4 Cumulative Effects .....	22
4.3 Water Resources .....	22
4.3.1 Description .....	22
4.3.2 Effects of SBE’s proposed project .....	23
4.3.3 Effects of No-Action .....	23
4.3.4 Cumulative Effects .....	23
4.4 Terrestrial Vegetation .....	23
4.4.1 Description .....	23
4.4.2 Effects of SBE’s proposed project .....	24
4.4.3 Effects of No-Action .....	24
4.4.4 Cumulative Effects .....	24
4.5 Wildlife .....	25
4.5.1 Description .....	25
4.5.2 Effects of SBE’s Proposed Project .....	25
4.5.3 Effects of No-Action .....	26
4.5.4 Cumulative Effects .....	26
4.6 Threatened and Endangered Species .....	26

4.6.1	Description .....	26
4.6.2	Effects of SBE’s Proposed Project .....	26
4.6.3	Effects of No-Action.....	26
4.6.4	Cumulative Effects.....	27
4.7	Socioeconomic Resources.....	27
4.7.1	Description .....	27
4.7.2	Effects of SBE’s Proposed Project .....	27
4.7.3	Effects of No-Action.....	28
4.7.4	Cumulative Impacts .....	28
4.8	Infrastructure/Utilities .....	28
4.8.1	Description .....	28
4.8.2	Effects of SBE’s Proposed Project .....	29
4.8.3	Effects of No-Action.....	29
4.8.4	Cumulative Impacts .....	30
4.9	Noise.....	30
4.9.1	Description .....	31
4.9.2	Effects of SBE’s proposed project.....	31
4.9.3	Effects of No-Action.....	32
4.9.4	Cumulative Impacts .....	32
4.10	Human Health and Safety.....	33
4.10.1	Description .....	33
4.10.2	Effects of SBE’s Proposed Project .....	33
4.10.3	Effects of No-Action.....	35
4.10.4	Cumulative Effects.....	35
4.11	Waste Management .....	36
4.11.1	Description .....	36
4.11.2	Effects of SBE’s Proposed Project .....	36
4.11.3	Effects of No-Action.....	37
4.11.4	Cumulative Impacts .....	37
4.12	Land Use.....	37
4.12.1	Description .....	37
4.12.2	Effects of SBE’s Proposed Project .....	37
4.12.3	Effects of No-Action.....	38
4.12.4	Cumulative Impacts .....	38
4.13	Sustainability .....	38
5.0	CONSULTATION AND COORDINATION .....	40
5.1	Agency Coordination .....	40
5.1.1	U.S. Fish and Wildlife Service (USFWS) .....	40
5.1.2	State Historic Preservation Office (SHPO).....	40
5.1.3	Bureau of Indian Affairs .....	40
5.2	Public Involvement .....	41
6.0	LIST OF PREPARERS.....	42
7.0	REFERENCES .....	43
8.0	GLOSSARY .....	46
APPENDICES .....		53
Appendix A	Air Emission Calculations .....	53

Appendix B	USFWS Consultation .....	58
Appendix C	SHPO Consultation .....	62
Appendix D	Contact with the Bureau of Indian Affairs and Tribal Councils.....	65

**LIST OF TABLES**

Table 2.4. Comparison of Impacts .....	11
Table 3.2. Impact Significance Thresholds.....	16
Table 4.1.2. SBE’s Proposed Project Emissions Compared to Applicability Thresholds.....	19
Table 4.9. Common Sounds and Their Levels.....	30
Table 4.9.1. Estimated Existing Noise levels at Nearby Noise-Sensitive Areas .....	31
Table 4.9.2. Noise Levels Associated with Outdoor Construction.....	32
Table A-1. Construction Equipment Use.....	53
Table A-2. Construction Equipment Emission Factors (pounds/hour).....	54
Table A-3. Construction Equipment Emissions (tons per year) .....	54
Table A-4. Painting.....	55
Table A-5. Delivery of Equipment and Supplies.....	55
Table A-6. Paving Off Gasses .....	55
Table A-7. Surface Disturbance.....	56
Table A-8. Worker Commutes.....	56
Table A-9. Total Construction Emissions (tons per year) .....	56
Table A-10. Boiler Emissions.....	57
Table A-11. Worker Commutes.....	57
Table A-12. Total Operational Emissions (tons) .....	57

**LIST OF FIGURES**

Figure 2.1-1. Vicinity Map .....	8
Figure 2.1-2. Project Area Map .....	9

## ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
°F	Degrees Fahrenheit
a.m.	<i>ante meridiem</i> (i.e. before noon)
ANR	State of Vermont Agency of Natural Resources
AQCR	Air Quality Control Region
BMPs	Best Management Practices
BTU	British Thermal Units
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
cm	Centimeter
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted Decibel
DC	Direct Current
DNL	Day-night Average Sound Level
DOE	U.S. Department of Energy
e.g.	<i>Exempli gratia</i> , for example
EA	Environmental Assessment
EDV	Electric Drive Vehicles
EERE	Energy Efficiency and Renewable Energy
EIS	Environmental Impact Statement
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Endangered Species Act
<i>et seq.</i>	<i>et sequens</i> , and the following one or ones
etc.	<i>et cetera</i> , and so on
FONSI	Finding of No Significant Impact
ft	Feet
ft <sup>2</sup>	Square Feet
FTE	Full-Time-Equivalent
GCP	General Construction Permit
HVAC	Heating, Ventilation, & Air Conditioning
Hz	Hertz
i.e.	<i>id est</i> , that is
I-89	Interstate 89
I-91	Interstate 91
km	Kilometer

km <sup>2</sup>	Square Kilometer
lbs	Pounds
L <sub>eq</sub>	Equivalent Sound Level
m	Meter
m <sup>2</sup>	Square Meter
MMBTU	Million British Thermal Units
MPV	Edward F Knapp State Airport
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
NHPA	National Historic Preservation Act
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
O <sub>3</sub>	Ozone
OSHA	Occupational Safety and Health Administration
P.L.	Public Law
p.m.	<i>post meridiem</i> (i.e. after noon)
Pb	Lead
PM <sub>10</sub>	Particulate Matter of 10 Micrometers or Less in Aerodynamic Diameter
PM <sub>2.5</sub>	Particulate Matter Less than 2.5 Micrometers in Aerodynamic Diameter
RCRA	Resource Conservation and Recovery Act
Recovery Act	American Recovery and Reinvestment Act of 2009, Public Law 111-5
SBE	SBE, Inc.
SHPO	State Historic Preservation Office or Officer
SO <sub>2</sub>	Sulfur Dioxide
SO <sub>x</sub>	Sulfur Oxides
TAFA	Thermal End Spray
tpy	Tons per Year
TSP	Total Suspended Particles
U.S.	United States
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VDEP	Vermont Department of Environmental Protection
VOC	Volatile Organic Compounds
VT	Vehicle Technologies

## 1.0 INTRODUCTION

### 1.1 Background

The Department of Energy's (DOE) National Energy Technology Laboratory (NETL) manages the research and development portfolio of the Vehicle Technologies (VT) Program for the Office of Energy Efficiency and Renewable Energy (EERE). A key objective of the VT program is accelerating the development and production of electric drive vehicle systems in order to substantially reduce the United States' consumption of petroleum. Another of its goals is the development of production-ready batteries, power electronics, and electric machines that can be produced in volume economically so as to increase the use of electric drive vehicles (EDVs).

Congress appropriated significant funding for the VT program in the American Recovery and Reinvestment Act of 2009, Public Law 111-5 (Recovery Act) in order to stimulate the economy and reduce unemployment in addition to furthering the existing objectives of the VT program. DOE solicited applications for this funding by issuing a competitive Funding Opportunity Announcement (DE-FOA-0000026), *Recovery Act - Electric Drive Vehicle Battery and Component Manufacturing Initiative*, on March 19, 2009. The announcement invited applications in seven areas of interest:

- Area of Interest 1 – projects that would build or increase production capacity and validate production capability of advanced automotive battery manufacturing plants in the United States.
- Area of Interest 2 – projects that would build or increase production capacity and validate production capability of anode and cathode active materials, components (e.g. separator, packaging material, electrolytes, and salts), and processing equipment in domestic manufacturing plants.
- Area of Interest 3 – projects that combine aspects of Area of Interest 1 and 2.
- Area of Interest 4 – projects that would build or increase production capacity and validate capability of domestic recycling or refurbishment plants for lithium ion batteries.
- Area of Interest 5 – projects that would build or increase production capacity and validate production capability of advanced automotive electric drive components in domestic manufacturing plants.
- Area of Interest 6 – projects that would build or increase production capacity and validate production capability of electric drive subcomponent suppliers in domestic manufacturing plants.
- Area of Interest 7 – projects that combine aspects of Area of Interest 5 and 6.

The application period closed on May 19, 2009, and DOE received 119 proposals across the seven areas of interest. DOE selected 30 projects based on the evaluation criteria set forth in the funding opportunity announcement; special consideration was given to projects that promoted the objectives of the Recovery Act – job preservation or creation and economic recovery – in an expeditious manner.

This project, Power Ring Manufacturing Scale-up, was one of the 30 DOE selected for funding. DOE's Proposed Action is to provide \$9,090,000 in financial assistance in a cost sharing arrangement with the project proponent, SBE, Inc. (SBE). The total cost of the project is estimated at \$18,186,387.

## 1.2 Purpose and Need for DOE Action

The overall purpose and need for DOE action pursuant to the VT program and the funding opportunity under the Recovery Act is to accelerate the development and production of various electric drive vehicle systems by building or increasing domestic manufacturing capacity for advanced automotive batteries, their components, recycling facilities, and EDV components, in addition to stimulating the United States' economy. This work will enable market introduction of various electric vehicle technologies by lowering the cost of battery packs, batteries, and electric propulsion systems for EDVs through high-volume manufacturing. DOE intends to further this purpose and satisfy this need by providing financial assistance under cost-sharing arrangements to this and the other 29 projects selected under this funding opportunity announcement.

This and the other selected projects are needed to reduce the United States' petroleum consumption by investing in alternative vehicle technologies. Successful commercialization of EDVs would support DOE's Energy Strategic Goal of "protect[ing] our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy." This project will also meaningfully assist in the nation's economic recovery by creating manufacturing jobs in the United States in accordance with the objectives of the Recovery Act.

## 1.3 Legal Framework

DOE prepared this EA in accordance with the Council on Environmental Quality (CEQ) "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act," codified in Title 40 of the *Code of Federal Regulations* in Parts 1500 through 1508 (40 CFR 1500-1508). These implement the procedural requirements of the National Environmental Policy Act (NEPA), found in Title 40 of the *United States Code* in Section 4321 and following sections (42 USC § 4321 *et seq.*).

NEPA *requires* Federal agencies to consider the potential environmental consequences of a Proposed Action in their decision-making processes. NEPA *encourages* Federal agencies to protect, restore, or enhance the environment through well-informed Federal decisions. The CEQ NEPA regulations specify that an EA be prepared to:

- Provide sufficient analysis and evidence for determining whether or not to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).
- Aid in an agency's compliance with NEPA when no EIS is deemed necessary.
- Facilitate EIS preparation when one is necessary.

Further, the CEQ NEPA regulations encourage agencies to integrate NEPA requirements with other environmental review and consultation requirements. Relevant environmental



requirements are contained in other Federal statutes, such as the Clean Air Act and the Clean Water Act, and their state counterparts. The following Federal and state statutes and regulations are relevant to this EA. Federal and state permits that may be required are also listed.

### **American Recovery and Reinvestment Act**

American Recovery and Reinvestment Act of 2009, Public Law 111-5 (Recovery Act) is an act making supplemental appropriations for job preservation and creation, infrastructure investment, energy efficiency and science, assistance to the unemployed, and State and local fiscal stabilization. It is funding through this act that DOE could fund the Proposed Action.

### **Clean Air Act**

The Clean Air Act (CAA), 42 USC § 7401 *et seq.*, establishes the National Ambient Air Quality Standards (NAAQS) developed by the U.S. Environmental Protection Agency (USEPA) for the pervasive pollutants: sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), lead (Pb), and particulate matter (both particulate matter of 10 micrometers or less in aerodynamic diameter (PM<sub>10</sub>) and particulate matter less than 2.5 micrometers in aerodynamic diameter (PM<sub>2.5</sub>)). The NAAQS are expressed as concentrations of the criteria pollutants in the ambient air, the outdoor air to which the general public is exposed. The CAA also contains emission control permit programs to protect the nation's air quality and establishes New Source Performance Standards that establish design standards, equipment standards, work practices, and operational standards for new or modified sources of air emissions. Where the NAAQS emphasize air quality in general, the New Source Performance Standards focus on particular industrial categories or sub-categories (e.g., fossil fuel fired generators, grain elevators, and steam generating units). Regulations implementing the CAA are found in 40 CFR Parts 50-95.

### **Clean Water Act**

The Clean Water Act (CWA), 33 USC § 1251 *et seq.*, establishes a comprehensive framework of standards, technical tools, and financial assistance to address "point source" pollution from municipal and industrial wastewater discharges and "nonpoint source" pollution from urban and rural areas. Applicants for federal licenses or permits to conduct any activity that may result in a discharge to navigable waters must provide the Federal agency with a state CWA Section 401 certification that the discharge would comply with applicable provisions of the CWA. CWA Section 404 establishes a permit program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. CWA Section 402 establishes the National Pollutant Discharge Elimination System (NPDES), which requires point sources of pollutants to obtain permits to discharge effluents and storm water to surface waters. Regulations for implementing relevant CWA programs are found in 33 CFR Parts 320-331 and 40 CFR Parts 400-503

### **Resource Conservation and Recovery Act**

The Resource Conservation and Recovery Act (RCRA), 42 USC § 6901 *et seq.*, regulates the treatment, storage, and disposal of solid and hazardous wastes. RCRA sets "cradle to grave"

standards for both solid waste and hazardous waste management. Certain wastes are specifically excluded because they are regulated under other statutes. Some examples are domestic sewage and septic tank waste, agricultural wastes, industrial discharges, some nuclear wastes, and mining overburden. RCRA regulations are found in 40 CFR Parts 239-282.

### **Comprehensive Environmental Response, Compensation, and Liability Act**

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC § 9601 *et seq.*, also known as “Superfund,” established a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA also establishes requirements for closed and abandoned hazardous waste sites, provides for the liability of persons responsible for the release of hazardous substances, and established a trust fund to pay for orphan facility cleanup and closure. Regulations for implementing CERCLA are found in 40 CFR Parts 300-312.

### **Emergency Planning and Community Right-to-Know Act**

The Emergency Planning and Community Right-to-Know Act (EPCRA), 42 USC § 1001 *et seq.*, requires Federal agencies to provide information on hazardous and toxic chemicals to state emergency response commissions, local emergency planning committees, and USEPA. EPCRA’s goal is to provide this information to ensure that local emergency plans are sufficient to respond to unplanned releases of hazardous substances. Regulations implementing EPCRA are found in 40 CFR Parts 350-374.

### **National Historic Preservation Act**

The National Historic Preservation Act (NHPA), 16 USC § 470 *et seq.*, requires DOE to consult with the State Historic Preservation Officer (SHPO) prior to any construction to ensure that no historical properties would be adversely affected by a proposed project. DOE must also afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed project. Regulations for implementing NHPA are found in 36 CFR 800-812.

### **Archaeological Resources Protection Act**

The Archaeological Resources Protection Act, 16 USC § 470aa *et seq.*, requires a permit for excavation or removal of archaeological resources from publicly held or Native American lands. The Act requires that excavations further archaeological knowledge in the public interest and that the resources removed remain the property of the United States. Regulations for implementing the Act are found in 43 CFR 7 and 36 CFR 296.

### **American Indian Religious Freedom Act**

The American Indian Religious Freedom Act, 42 USC § 1996, establishes policy to protect and preserve the inherent and Constitutional right of Native Americans to believe, express, and exercise their traditional religions. The law ensures the protection of sacred locations; access of

Native Americans to those sacred locations and traditional resources that are integral to the practice of their religions; and establishes requirements that would apply to Native American sacred locations, traditional resources, or traditional religious practices potentially affected by construction and operation of proposed facilities. Regulations for implementing the Act are also found in 43 CFR 7.

### **Native American Graves Protection and Repatriation Act**

The Native American Graves Protection and Repatriation Act, 25 USC § 3001, directs the Secretary of the Interior to guide the repatriation of federal archaeological collections and collections that are culturally affiliated with Native American tribes and held by museums that receive federal funding. DOE would follow the provisions of this Act if any excavations associated with the proposed construction led to unexpected discoveries of Native American graves or grave artifacts. Regulations for implementing the Act are found in 43 CFR 10.

### **Endangered Species Act**

The Endangered Species Act (ESA), 16 USC 1531 *et seq.*, establishes a national program for the conservation of threatened and endangered species of fish, wildlife, and plants, as well as the preservation of the ecosystems on which they depend. ESA Section 7 requires any federal agency authorizing, funding, or carrying out any action to ensure that the action is not likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of critical habitat of such species. Regulations implementing the ESA interagency consultation process are found in 50 CFR Part 402.

### **Fish and Wildlife Conservation Act/Fish and Wildlife Coordination Act**

The Fish and Wildlife Conservation Act, 16 USC § 2901 *et seq.*, encourages Federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitats. In addition, the Fish and Wildlife Coordination Act, 16 USC § 661 *et seq.*, requires Federal agencies undertaking projects affecting water resources to consult with the United States Fish and Wildlife Service (USFWS) and the state agency responsible for fish and wildlife resources. Compliance with these statutes is internalized in the DOE NEPA process.

### **Noise Control Act**

The Noise Control Act of 1972, 42 USC § 4901 *et seq.*, directs federal agencies to carry out programs in their jurisdictions to the fullest extent within their authority and in a manner that furthers a national policy of promoting an environment free from noise that jeopardizes health and welfare. This would involve complying with applicable municipal noise ordinances to the maximum extent practicable.

### **Occupational Safety and Health Act**

The Occupational Safety and Health Act, 29 USC § 651 *et seq.*, requires employers to furnish employees a place of employment that is free from recognized hazards that are causing or are

likely to cause death or serious physical harm to the employees, and to comply with occupational safety and health standards promulgated by the Occupational Safety and Health Administration (OSHA). OSHA standards are implemented under regulations found in 29 CFR Parts 1900-2400.

### **Pollution Prevention Act**

The Pollution Prevention Act, 42 USC § 13101 *et seq.*, establishes a national policy for waste management and pollution control that focuses first on source reduction, and then on environmentally safe waste recycling, treatment, and disposal. Three executive orders provide guidance to agencies to implement the Pollution Prevention Act: Executive Order 12873, “Federal Acquisition, Recycling, and Waste Prevention,” Executive Order 13101, “Greening the Government through Waste Prevention, Recycling, and Federal Acquisition,” and Executive Order 13148, “Greening the Government through Leadership in Environmental Management.”

### **Executive Orders**

A number of presidential executive orders in addition to those noted above provide additional guidance to Federal agencies in developing EAs, including this EA. The most relevant of them include:

- Executive Order 11514, “Protection and Enhancement of Environmental Quality”
- Executive Order 11988, “Floodplain Management”
- Executive Order 12856, “Right to Know Laws and Pollution Prevention Requirements”
- Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”
- Executive Order 13423, “Strengthening Federal Environmental, Energy, and Transportation Management”
- Executive Order 13514, “Federal Leadership in Environmental, Energy, and Economic Performance”

Federal executive orders can be accessed at: <http://www.archives.gov/federal-register/codification/>.

### **Federal and State Permitting**

The following are potentially applicable federal and state permitting requirements to construct and operate the proposed facilities.

- Clean Water Act, Section 401 Certification, Section 402 NPDES Permit, Section 404 Wetlands Permit, and Pretreatment Authorization for Discharge of Wastewater to Municipal Collection System, 40 CFR Parts 104-140, 403
- Clean Air Act, 40 CFR Parts 50-96
- Federal Construction General Permit, Stormwater Discharge, VTR10000F
- NPDES, No Exposure Certification Form EPA 3510-11
- General Construction Permit (GCP), VSA 3-9020

## 2.0 PROPOSED DOE ACTION AND ALTERNATIVES

DOE's Proposed Action for the Vehicle Technologies Program is to accelerate the development and production of electric-drive vehicle systems in order to reduce the United States' consumption of petroleum by providing SBE with \$9.09 million in financial assistance in a cost-sharing arrangement in order to facilitate construction and operation of an advanced Direct Current (DC) Bus capacitor manufacturing facility.

### 2.1 SBE's Proposed Project

The objective of SBE's proposed project is to construct and qualify a state-of-the-art DC Bus Capacitor facility that is capable of meeting a 100,000 EDV production capacity level. SBE would utilize the proposed new facility for the development of new equipment, performance testing, and an actual production run as part of SBE's existing DC Bus capacitor line. SBE would design and construct a new facility, located at the existing Wilson Industrial Park in Barre, Vermont (Figure 2.1-1), which is about one mile (1.6 kilometers) from SBE's existing facility. The facility would be designed and pre-permitted for efficient expandability. The new manufacturing facility would include office space. A portion of the new facility would be environmentally controlled, meaning air and humidity conditioning and a class 10,000 cleanroom of approximately 4,000 square feet. The building footprint would be expected to be 52,800 square feet (ft<sup>2</sup>) (4,905 square meters (m<sup>2</sup>)), including parking and driveways (SBE, 2009).

The project would include all engineering work required to finalize the designs of all equipment needed. This would also include the acquisition of early equipment designs to be trialed within the existing manufacturing line. The first article of equipment delivered to be "proven out" would be used as part of SBE's existing low rate production line in Barre. Preliminary design of the new production facility would then be completed. Subsequently, the final design and construction of the new facility would occur. Once the new facility was completed, equipment installation would begin, some on a "phase in basis" as the process approvals of the facility would occur. Once the first articles were produced on the line, SBE would perform validation testing to provide internal feedback to the project before external validation with customers would begin.

SBE uses processed polypropylene film, tin and zinc wire, a resin encapsulant material, copper and stainless steel hardware, and Polycarbonate and Polystyrene plastic cases along with a small amount of conductive silver epoxy and creates High Power Capacitors as output. The washing is done with distilled water and small amounts of alcohol. There are also small amounts of ink used in the manufacturing process. No materials in the manufacturing process emit volatiles during processing and are likewise nonhazardous. This proposed project would involve new technology and equipment being installed. The new facility would have web conversion equipment, thermal spray, meter/mix/dispense equipment, curing ovens, and electric test equipment. Web conversion would rewind aluminum/zinc metalized polypropylene capacitor film. The thermal spray would deposit zinc and tin on capacitor winding to facilitate electrical connections. The meter, mix, and dispense equipment would be for encapsulants and conductive epoxy. The electrical test equipment would charge and discharge capacitors. Proper maintenance schedules would be established and adhered to as part of the companies best management practices (BMPs).

A full decommissioning of the DC Bus capacitor facility is not anticipated to occur after cessation of the proposed project/funding. SBE may continue to use the facility and equipment after the Electric Drive Vehicle Battery and Component Manufacturing Initiative ends. When decommissioning of the building or equipment would occur, the activities would occur in compliance with all applicable regulations.

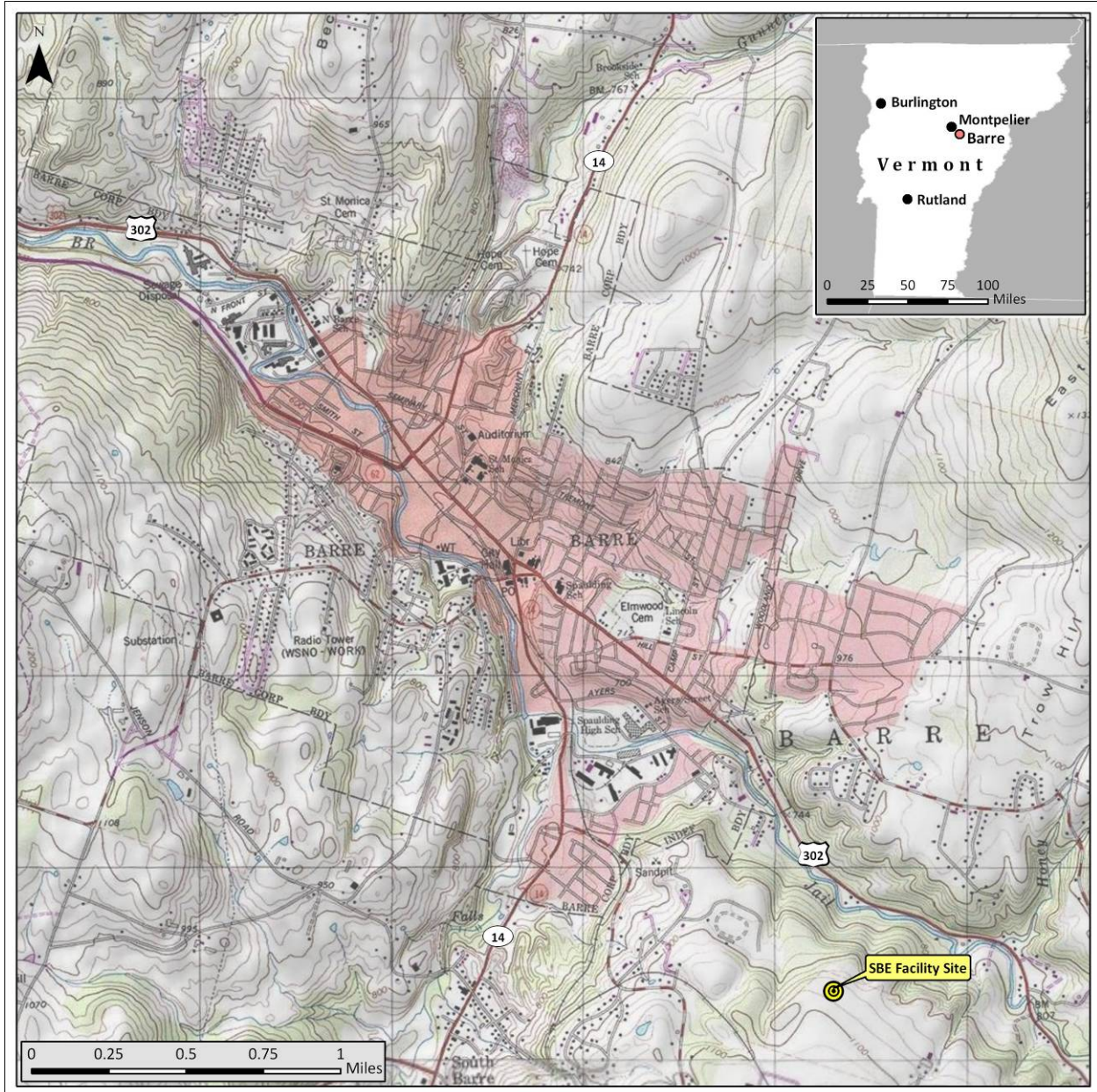


Figure 2.1-1. Vicinity Map

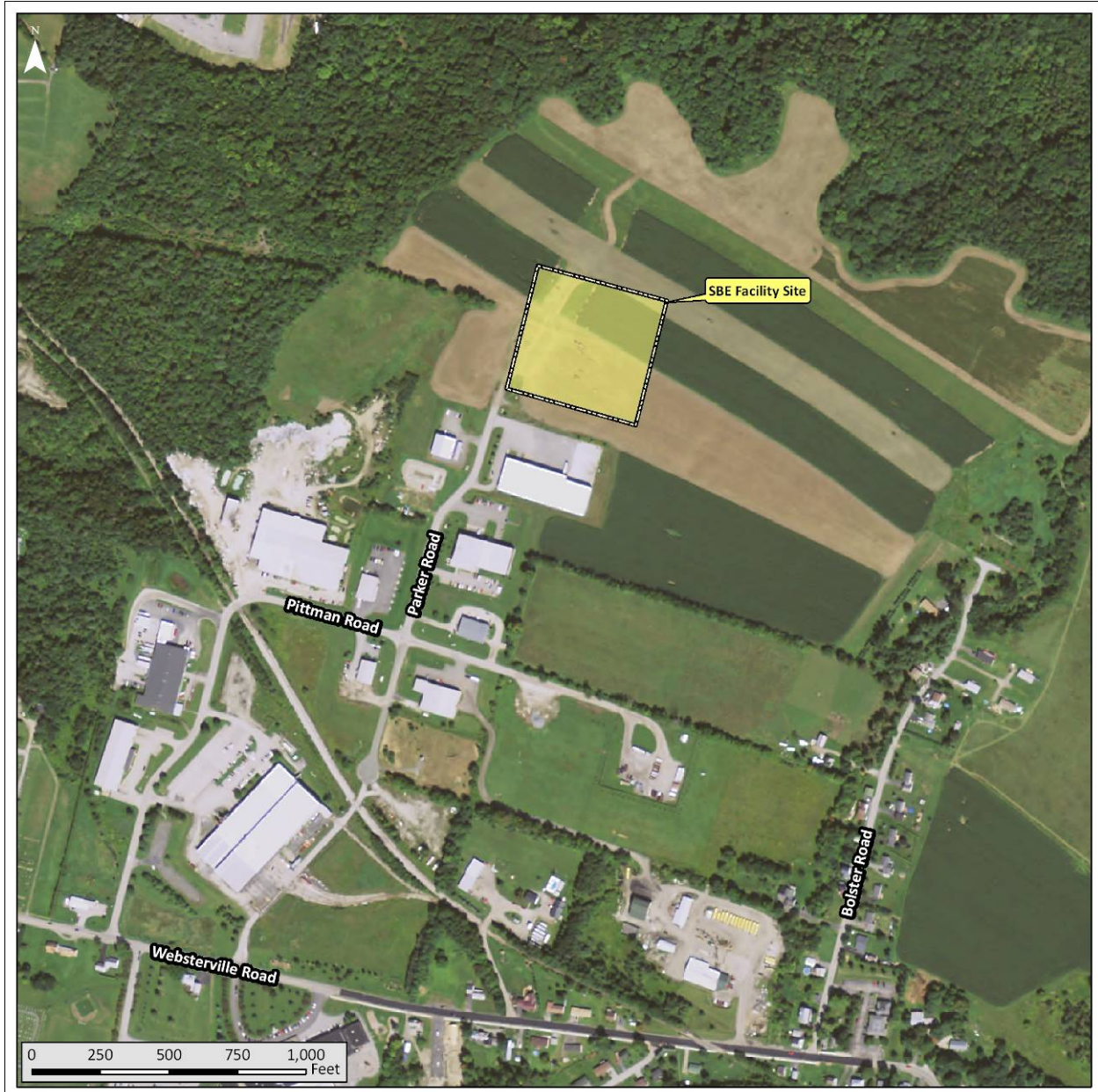


Figure 2.1-2. Project Area Map

## 2.2 Alternatives

DOE's alternatives to this project consist of the 45 technically acceptable applications received in response to the Funding Opportunity Announcement, *Recovery Act - Electric Drive Vehicle Battery and Component Manufacturing Initiative*. Prior to selection, DOE made preliminary determinations regarding the level of review required by the National Environmental Policy Act (NEPA) based on potentially significant impacts identified in reviews of acceptable applications. DOE conducted these preliminary environmental reviews pursuant to 10 CFR 1021.216, although a variance to certain requirements in that regulation was granted by the Department's General Counsel (74 Federal Register 30558, June 26, 2009). These preliminary NEPA determinations and reviews were provided to the selecting official, who considered them during the selection process.

Because DOE's Proposed Action is limited to providing financial assistance in cost-sharing arrangements to projects submitted by applicants in response to a competitive funding opportunity, DOE's decision is limited to either accepting or rejecting the project as proposed by the proponent, including its proposed technology and selected sites. DOE's consideration of reasonable alternatives is therefore limited to the technically acceptable applications and a no-action alternative for each selected project.

## 2.3 No-Action Alternative

Under the No-Action Alternative, DOE would not provide funds to the proposed projects. As a result, these projects would be delayed as they look for other funding sources to meet their needs, or abandoned if other funding sources are not obtained. Furthermore, acceleration of the development and production of various electric drive vehicle systems would not occur or would be delayed. DOE's ability to achieve its objectives under the VT program and the Recovery Act would be impaired.

Although this and other selected projects might proceed if DOE decided not to provide financial assistance, DOE assumes for purposes of this environmental analysis that the project would not proceed without DOE assistance. If projects did proceed without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative (i.e., providing assistance that allows the project to proceed). In order to allow a comparison between the potential impacts of a project as implemented and the impacts of not proceeding with a project, DOE assumes that if it were to decide to withhold assistance from a project, it would not proceed.

## 2.4 Comparison of Impacts

Table 2.4 below comparing impacts of the SBE's proposed project and the No-Action Alternative is based on the premise described in Section 2.3 that the project would not proceed without DOE funds.



<b>Table 2.4. Comparison of Impacts</b>		
<b>Resource</b>	<b>No-Action Alternative</b>	<b>SBE's Proposed Project</b>
Air Quality	No change in air quality	Short-term minor and long-term negligible adverse effects on air quality would be expected. The effects would be from air emissions during construction and from operational sources of air emissions at the proposed bus capacitor facility. Increases in emissions would not exceed <i>de minimis</i> thresholds, be regionally significant, or contribute to a violation of any federal, state, or local air regulation.
Geology and Soils	No change	Proposed construction is limited to surface and near-surface activity that will have no potential to affect minerals and deeper geological strata. Changes in geological or soil stability, permeability, or productivity are limited in extent. Full recovery would occur in a reasonable time*, as provided for in permit conditions for the project.
Water Resources	No change	Slight changes to surface water quality or hydrology would be confined to the immediate project area. Full recovery would occur in a reasonable time, as provided for in permit conditions for the project.
Terrestrial Vegetation	No change	Overall, any changes to native vegetation would be limited to a small area and would not affect the viability of the resources. Full recovery would occur in a reasonable time, considering the size of the project and the affected resource's natural state.
Wildlife	No change	Overall, any changes to native wildlife would be limited to a small area and would not affect the viability of local population. Full recovery would occur in a reasonable time, considering the size of the project and the affected resource's natural state.

<b>Table 2.4. Comparison of Impacts</b>		
<b>Resource</b>	<b>No-Action Alternative</b>	<b>SBE's Proposed Project</b>
Threatened and Endangered Species	No change	Construction activities for the new facility would not disturb or destroy any habitat that could support listed species that may occur in the area
Socioeconomic Resources	No change	Impacts would be beneficial but would not require an influx of workers and employees that could increase the population, change the demographics of the project area, or potentially overburden finite community resources, such as schools, housing, health facilities, or law enforcement capabilities
Infrastructure/Utilities	No change	Some short-term, minor traffic impacts during construction with some infrastructure improvements (mostly electrical) to occur.
Noise	No change	Operation of the proposed facility would not generate disruptive noise levels if BMPs are followed
Human Health and Safety	No change	Appropriate BMPs and adherence to regulations would minimize the risks present with project implementation. With proper safety procedures in place, the impact to human health and safety should be minimal.
Waste Management	No change	With BMPs and appropriate plans updated, the changes and quantities of waste would represent minimal changes to current conditions.
Land Use	No change	A planned and permitted conversion of hayfield and cornfield to industrial use.

\* Recovery in a reasonable time: Constant, sustainable improvement is apparent and measurable when the site is routinely observed, and full recovery is achieved over a period of no more than several years.

## 2.5 Issues Considered But Dismissed from Further Analysis

The Purpose and Need section above highlighted the importance of the overall program of evaluating EDV as one tool among many to address VT and Recovery Act objectives while providing this nation with a secure energy future and job stability. Many potential impact issues associated with EAs were reviewed to compile this EA for DOE. Because of the lack of potential impacts to certain portions of the environment, due to the specific characteristics of SBE's proposed project, the following issues were considered but dismissed from detailed analysis:

## **Wetlands and Floodplains**

There are no wetlands in the National Wetland Inventory or floodplains in or near the proposed site at SBE in Barre, Vermont. Thus, any impacts would be expected to be negligible, if any, and wetlands and floodplains were dismissed from further analysis. If wetlands were found at the site, the work would stop until appropriate authorities were contacted, permits received, and, if necessary, mitigation performed.

## **Environmental Justice**

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic or socioeconomic group, should bear a disproportionate share of the adverse environmental consequences resulting from a proposed federal action.

Federal agencies must identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations (Executive Order 12898). An environmental justice population is defined as a population comprised of at least half minority status or at least half low-income status, or whose representation of these categories is greater than the general population in a meaningful way. The U.S. Census Bureau defines the average poverty threshold as a maximum annual income of \$22,025 or less for a family of four for the year 2008 (HHS, 2009).

The population of Barre is 97% White non-Hispanic. The town has 13.0% of its residents below the federal poverty level, compared to the state rate of 9.4% and the U.S. rate of 12.4%. The very low percentage of “minority” residents (defined as Black or African-American, Hispanic or Latino, Asian, American Indian, Native Hawaiian or other Pacific Islander) and the statistical similarity in poverty rates between Barre and the U.S. overall suggests there would be no disproportionate impacts on minority or low income communities from implementing the SBE’s proposed project. Therefore, environmental justice was dismissed from further analysis.

## **Cultural Resources**

Although there would be ground disturbance at the SBE site, all of these activities would be within an existing industrial site and in a disturbed location. The State Historic Preservation Office and appropriate Tribes have been contacted for any possible concerns regarding this project. While there was no Tribal response, the SHPO concluded no impact to historic properties (Appendix C). Further, no known eligible or listed National Register of Historic Places sites exist within one mile (approximately 1.6 km) of the proposed site. The closest reservation is Saint Regis Indian Reservation, which is 120 miles (190 km) west, and the closest cemetery is Saint Sylvester Cemetery, which is 0.5 miles (0.8 km) southwest. Impacts to these cultural resources are unlikely due to the distances of each site from these sensitive areas and the types of proposed activities. This reduces the incremental impacts, if any, to surrounding sensitive cultural areas.

Also, because cultural resource impacts are generally local (within the radius of the proposed construction site), cultural resource impacts to reservations or cemeteries are unlikely. Therefore, there is a negligible chance of impacting cultural resources, and cultural resources have been eliminated from further analysis. Should any cultural resources be discovered during construction, work in the area would cease, and the discovery would be reported immediately to the appropriate State Historic Preservation Officer and any relevant Native American Tribes.

Below are additional issues considered but dismissed due to absence in the project area.

Right-of-Way Acquisition	There was no need for additional right-of-way.
Wild & Scenic Rivers	There are no designated Wild & Scenic Rivers within proximity of the project site.
Impact Property Values	This is a minor expansion within an existing industrial park.
Alter Local Hydrology Patterns	None of the proposed construction would impact drainage in the local watershed.

### 3.0 THE ENVIRONMENTAL ANALYSIS APPROACH

This chapter describes how the environmental review team analyzed the potential impacts of SBE's proposed project (i.e., the building and operation of the Power Ring Manufacturing Scale-up project). Chapter 4 provides a description of the affected environment and the potential environmental effects of SBE's proposed project along with an analysis of environmental effects if the project were not implemented (No-Action Alternative).

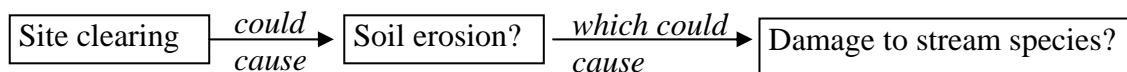
#### 3.1 Approach to the Analysis

An EA is intended to be a clear, focused analysis of impacts. It is not intended to be merely a compilation of encyclopedic information about the project or about the environment. Accordingly, the environmental review team used a systematic approach to identifying, and then answering the relevant impact questions.

The initial step was to develop a detailed description of the components of the Power Ring Manufacturing Scale-up process to be used at the proposed site to study the potential of furthering VT and Recovery Act objectives. This description was presented in Chapter 2.

For each project component (e.g., construction of the facility), the team sought to identify all the types of direct effects which that activity could cause on relevant environmental resources. For example, clearing a site of vegetation could cause soil erosion. In doing this preliminary identification of the types of impacts that potentially could occur, the team drew upon their experience with previous projects.

For each potential direct effect, the team then sought to identify the potential indirect effects on other environmental resources. For example, soil erosion could cause sedimentation in nearby streams, which could in turn harm the fish and other species in the stream.



This served as the framework of the analysis of impacts. That is, the team focused their efforts on answering these questions as to whether these effects would in fact occur, and if so, how extensive, how severe, and how long lasting they would be. This was then compared to the significance levels found in Table 3.2 below.

#### 3.2 Analysis of Significance

The review team used a systematic process to evaluate the importance, or significance, of the predicted impacts. This process involved comparing the predictions to the significance criteria established by the team and set out below in Table 3.2. These significance criteria were based on legal and regulatory constraints and on team members' professional technical judgment.

<b>Table 3.2. Impact Significance Thresholds</b>	
<b>Resource Area</b>	<b>Impact Significance Thresholds</b>
	<b>An impact would be significant if it EXCEEDS the following conditions.</b>
Air Quality	The project would not produce emissions that would exceed applicability thresholds, be regionally significant, or contribute to a violation of any federal, state, or local air regulation.
Geology and Soils	Any changes in soil stability, permeability, or productivity would be limited in extent. Full recovery would occur in a reasonable time*, considering the size of the project. Mitigation, if needed, would be simple to implement.
Surface Water	Any changes to surface water quality or hydrology would be confined to the immediate project area. Full recovery would occur in a reasonable time, considering the size of the project and the affected area's natural state.
Groundwater	Any changes to groundwater quality and quantity would be at the lowest detectable levels. Full recovery would occur in a reasonable time. Mitigation, if needed, would be simple to implement.
Terrestrial Vegetation	Any changes to native vegetation would be limited to a small area and would not affect the viability of the resources. Full recovery would occur in a reasonable time, considering the size of the project and the affected resource's natural state. Mitigation, if needed, would be simple to implement.
Wildlife	Any changes to wildlife would be limited to a small portion of the population and would not affect the viability of the resource. Full recovery would occur in a reasonable time, considering the size of the project and the affected species' natural state.
Threatened or Endangered Species	Any effect to a federally listed species or its critical habitat would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population. This negligible effect would equate to a "no effect" determination in U.S. Fish and Wildlife Service terms.
Socioeconomic Resources	Changes to the normal or routine functions of the affected community are short-term or do not alter existing social or economic conditions in a way that is disruptive or costly to the community.
Infrastructure/ Utilities	The project would not noticeably affect or disrupt the normal or routine functions of public institutions, roads, electricity, and other public utilities and services in the project area.
Noise	Noise levels in the project area would not exceed ambient noise level standards as determined by the Federal, state, and/or local government.
Human Health and Safety	The project, with current and updated safety procedures, would pose no more than a minimal risk to the health and safety of on-site workers and the local population.

<b>Table 3.2. Impact Significance Thresholds</b>	
<b>Resource Area</b>	<b>Impact Significance Thresholds</b>
	<b>An impact would be significant if it EXCEEDS the following conditions.</b>
Waste Management	The action, along with planned mitigation measures, would not cause air, water, or soil to be contaminated with hazardous material that poses a threat to human or ecological health and safety.
Land Use	Any change in land use would be limited to a small area and would not noticeably alter any particular land use at the industrial park or in the adjacent areas. The affected areas would fully recover in a reasonable time once the project is completed.

\* Recovery in a reasonable time: Constant, sustainable improvement is apparent and measurable when the site is routinely observed, and full recovery is achieved over a period of no more than several years.

## **4.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS**

### **4.1 Air Quality**

#### **4.1.1 Description**

The USEPA Region 1 and the Vermont Department of Environmental Protection (VDEP), regulate air quality in Vermont. The CAA (42 USC 7401-7671q) gives USEPA the responsibility to establish the primary and secondary NAAQS (40 CFR Part 50) that set acceptable concentration levels for seven criteria pollutants: PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, CO, NO<sub>x</sub>, ozone (O<sub>3</sub>), and lead. Short-term standards (1-, 8-, and 24-hour periods) have been established for pollutants that contribute to acute health effects, while long-term standards (annual averages) have been established for pollutants that contribute to chronic health effects. Each state has the authority to adopt standards stricter than those established under the federal program; however, Vermont accepts the federal standards. Federal regulations designate Air-Quality Control Regions (AQCRs) that are in violation of the NAAQS as nonattainment areas and those in accordance with the NAAQS as attainment areas.

Washington County (and therefore the proposed bus capacitor facility) is in the Vermont Intrastate AQCR (40 CFR 81.346). USEPA has designated Washington County as in attainment for all criteria pollutants (USEPA, 2009a). Because the project is in an attainment area, the air conformity regulations do not apply. However, the projects emissions and the applicability thresholds under the general conformity rules were carried forward to determine the level of impact under NEPA.

#### **4.1.2 Effects of SBE's Proposed Project**

Short-term minor and long-term negligible adverse effects on air quality would be expected. The effects would be from air emissions during construction, and minute emissions from the operation of the proposed bus capacitor facility. Increases in emissions would not exceed applicability thresholds, be regionally significant, or contribute to a violation of any federal, state, or local air regulation.

***Estimated Emissions and General Conformity.*** The general conformity rules require federal agencies to determine whether their action(s) would increase emissions of criteria pollutants above preset threshold levels (40 CFR 93.153(b)). These *de minimis* (of minimal importance) rates vary depending on the severity of the nonattainment and geographic location. Because the region is in attainment, the air conformity regulations do not apply. All direct and indirect emissions of criteria pollutants for SBE's proposed project have been estimated and compared to *de minimis* threshold levels of 100 tons per year (tpy) to determine the proposed project's impact under NEPA. The total direct and indirect emissions associated with the following activities were accounted for:

- Constructing the new facilities
- Operating vehicles for construction workers
- Paving parking areas



- Operating personal vehicles for employees
- Operating new stationary sources of air emissions

The total direct and indirect emissions associated with SBE’s proposed project would not exceed *de minimis* threshold levels (Table 4.1.2). Because the region is an attainment area, there is no existing emission budget. Because of the limited size and scope of SBE’s proposed project, however, it is not expected that the estimated emissions from the development and operation of the proposed facility would make up 10 percent or more of regional emissions for any criteria pollutant, and they would, therefore, not be regionally significant. A detailed breakdown of construction and operational emissions are in Appendix A.

Activity	Annual emissions (tpy)						<i>De minimis</i> threshold (tpy)	Would emissions exceed applicability thresholds? [Yes/No]
	CO	NO <sub>x</sub>	VOC	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>		
Construction	5.32	6.28	1.16	<0.01	0.95	0.41	100	No
Operational	8.29	1.15	0.87	<0.01	<0.01	<0.01	100	No

Note: VOC is Volatile Organic Compounds, and SO<sub>x</sub> is sulfur oxides.

In addition to criteria pollutants, the facility would emit insignificant amounts of tin-zinc and zinc. This would utilize half the dust collector capacity and produce 1.4 lbs of emissions per year based on the unit’s 99.999% efficiency. These effects would be negligible.

For the purposes of calculating emissions, it was assumed that approximately 100 permanent personnel would be employed at the proposed bus capacitor facility. Moderate changes in the size or type of equipment ultimately selected or the number of personnel would not substantially change the total direct or indirect emissions or the level of impact under NEPA. Therefore, the impacts would be expected to be less than the significance threshold.

**Regulatory Review.** Stationary sources of air emissions associated with SBE’s proposed project may be subject to federal and state air permitting regulations. These requirements include, but are not limited to, minor new source review, nonattainment new source review, prevention of significant deterioration, and new source performance standards for selected categories of industrial sources. The proposed bus capacitor facility would not be equipped with any new stationary sources of air emissions. No permits to construct or operate would be required.

Other non-permitting requirements may be required through the use of compliant practices and/or products. These regulations are outlined in VAC Title 10, Part 1, Chapter 23: Vermont Air Pollution Control Regulations. They include:

- Open Burning Prohibited (Subsection 5-201)
- Permissible Open Burning (Subsection 5-202)
- Prohibition of Particulate Matter (Subsection 5-231)
- Prohibition of Nuisance and Odor (Subsection 5-241)
- Control of Volatile Organic Compounds (Subsection 5-253)

In addition to those outlined above, no person shall handle, transport, or store any material in a manner which may allow unnecessary amounts of air contaminants to become airborne. During construction, reasonable measures may be required to prevent unnecessary amounts of particulate matter from becoming airborne (Subsection 5-401). This listing is not all-inclusive; SBE and any contractors would comply with all applicable air pollution control regulations. Outside of these best management practices, no mitigation measures would be required for the construction and operation of the proposed bus capacitor facility. With BMPs in place, the projected impacts would be less than the significance threshold.

#### **4.1.3 Effects of No-Action**

Selecting the No-Action Alternative would result in no impact to ambient air-quality. No construction would be undertaken, and no new facility operations would take place. Ambient air-quality conditions would remain as described in Sections 4.1.1.

#### **4.1.4 Cumulative Effects**

The State of Vermont takes into account the effects of all past, present, and reasonably foreseeable emissions during the development of the State Implementation Plan. The state accounts for all significant stationary, area, and mobile emission sources in the development of this plan. Estimated emissions generated by SBE's proposed project would be *de minimis* and would not be regionally significant. Therefore, SBE's proposed project would not contribute significantly to adverse cumulative effects to air quality.

### **4.2 Geology and Soils**

#### **4.2.1 Description**

Surface geology in the project area was primarily influenced by the Laurentide ice sheet, the last continental-scale glacier that covered all of New England. The ice sheet formed in Hudson's Bay, Canada 80,000 – 100,000 years ago and advanced toward New England as the climate cooled. It flowed south and east up the Lake Champlain valley and tributary valleys that included the Winooski River Valley in the project area and retreated back across Vermont approximately 14,000 years ago (Wright and Larsen, 2004).

The most common surface material deposited by the ice sheet is a mixture of clay, sand, gravel, and boulders known as glacial till. The weight of the ice sheet compressed the material very densely, making it difficult to dig in and earning the alternative name of "hardpan" (Wright and Larsen, 2004).

When the ice melted, the stream sediments deposited in a geologic tunnel that carried meltwater beneath the glacier were left standing high and dry. The resulting landform is an *esker*. An esker extends along parts of the Stevens Branch valley from Williamstown to Barre and from there north to East Montpelier. Big gravel pits in the valley are located along segments of this esker (Wright and Larsen, 2004).

Specifically, soil on the project site is more than 90% Buckland silt loam. This soil is a moderately well drained soil derived from coarse-loamy basal till and is generally found on till plains and knolls at slopes on the project site ranging from 3% to 25% (USDA, 2009).

Throughout history, the project area has had some instances where tremors and earthquakes have been felt by residents, although the origins of the quakes and tremors were elsewhere. This area is located in seismic zone 2A, as defined by the Uniform Building Code, which has relatively minor enforceable requirements for structural design (Von Hake, 1973).

The nearby city of Barre, VT promotes itself as the "Granite Center of the World," which in addition to sand and gravel extraction pits, represent commercial value found in some of the mineral resources in the area. There is no active mining on the project site.

The State of Vermont Agency of Natural Resources (ANR) has issued Construction General Permit 3-9020, Authorization of Notice of Intent # 6228-9020 (VANR, 2009a), to the project proponents. ANR has indicated acceptance of proposed procedures for stormwater management and construction practices that prevent runoff of unprotected soils. The project proponent has submitted and received approval from ANR for plans that include a stormwater detention basin and other standard erosion control measures.

#### **4.2.2 Effects of SBE's Proposed Project**

Construction activities associated with the project would have the greatest potential to generate effects on geological and soil resources. Proposed construction is limited to surface and near-surface activity that would have no potential to affect minerals and deeper geological strata. Seismic activity in this region is very minor and would be adequately addressed through compliance with local building codes.

Soil loss and erosion are the major geological resources to be considered and managed with this project. Planned best management practices that can effectively prevent major effects to this resource include use of erosion control blankets where soil would otherwise be exposed, avoidance of excessive soil stockpiling where soil is exposed to wind and rain, a sediment settling basin as part of the runoff control program, use of water and dust palliatives on soils that are temporarily exposed to erosive elements, and proper use of temporary or permanent landscaping that would hold soils in place and prevent unwanted soil movement.

Changes in geological or soil stability, permeability, or productivity are limited in extent. Full recovery would occur in a reasonable time, as provided for in permit conditions for the project; therefore, the projected impacts to geology and soils would be less than the significance threshold.

### **4.2.3 Effects of No-Action**

Without Department of Energy funding (No-Action Alternative), none of the proposed construction activity, nor the operations activities would occur. The absence of construction or operations activities would cause no effects on this resource.

### **4.2.4 Cumulative Effects**

There are no past, present, or foreseeable future projects, which can be analyzed collectively with SBE's proposed project that would result in a greater cumulative effect on this resource than what would occur singularly as a result of the proposed project.

## **4.3 Water Resources**

### **4.3.1 Description**

The project site, together with the city and town of Barre, VT are located within the 129 square mile (334 square kilometer (km<sup>2</sup>)) watershed of the Stevens Branch of the Winooski River. The Stevens Branch waterway flows in a northerly direction past a point approximately one mile west of the project site. The Jail Branch joins the Stevens Branch in Barre City after flowing northwesterly past a point 1/3- mile (0.5 km) north of the project site. Beyond this confluence, on the western side of Barre City Stevens Branch is channelized to protect adjacent development and there is a waste management zone designation below the Barre Wastewater Treatment Plant (VANR, 2008a).

The project proponents have obtained wastewater system and potable water supply permits from the State of Vermont (VANR, 2009b), indicating that facilities and procedures are or would be in place to assure compliance with governing state rules and regulations relating to wastewater discharge and water supply. Potable water supply and wastewater discharge would utilize existing public systems owned and operated by the Town of Barre. The Town of Barre has confirmed the capacity necessary to accommodate this project (BARRE, 2009).

Since the water supply would be from a public source and construction is limited to near-surface activity, groundwater sources would not be affected and will not be analyzed further in this environmental assessment.

The ANR has issued No Exposure Certification No. 6228-9003 (VANR, 2009c) and Construction General Permit 3-9020, Authorization of Notice of Intent # 6228-9020 (VANR, 2009a), to the project proponents. With these issuances, the ANR has indicated acceptance of proposed procedures for stormwater management and construction practices that are protective of runoff-receiving waters.

Central Vermont receives 40 inches of annual precipitation, with 30 inches (76 centimeters (cm)) as rain and 10 inches (25 cm) that represent approximately 108 inches (274 cm) of snowfall. The average high temperature in July is 81 degrees Fahrenheit (°F) (27 degrees Celsius (°C)) with an

average low of 55°F (13°C). In January, the average high is 27°F (-3°C) with an average low of 4°F (-16°C) (CVCoC, 2009).

### **4.3.2 Effects of SBE's proposed project**

Both construction and operations activities have the potential to affect water resources in the project area. During the construction and operations phases, erosion control measures are planned that are the basis for compliance with a construction general permit and No Exposure Certification that have been obtained by the project proponents.

Potential infrastructure capacity issues have been addressed through a review process that has resulted in approval received from the state of Vermont and confirmation of capacity from the Town of Barre, Vermont. Since water supply and wastewater treatment would be accomplished through public sources with the Town of Barre, any potential concerns with groundwater sources and on-site waste disposal are avoided.

Slight changes to surface water quality or hydrology are confined to the immediate project area. Full recovery would occur in a reasonable time, as provided for in permit conditions for the project; therefore, the projected impacts would be less than the significance threshold.

### **4.3.3 Effects of No-Action**

Under the No-Action Alternative, neither the proposed construction activity, nor the operations activities would occur. The absence of construction or operations activities would cause no effects on this resource.

### **4.3.4 Cumulative Effects**

There are no past, present, or foreseeable future projects, which can be analyzed collectively with the SBE's proposed project that would result in a greater cumulative effect on this resource than what would occur singularly as a result of the proposed project.

## **4.4 Terrestrial Vegetation**

### **4.4.1 Description**

The vacant land proposed for the new SBE facility was historically a dairy farm and has been used for hay fields since the issuance of the land use permits that created the Wilson Industrial Park in 1996 (Vermont, 1996). Weeds and opportunistic plants such as thistles, mustard, and sunflowers generally emerge on fallow agricultural land.

Executive Order 13112 Invasive Species directs federal agencies to make efforts to prevent the introduction and spread of invasive plant species. Invasive species are usually destructive, difficult to control or eradicate, and generally cause ecological and economic harm. A noxious weed is any plant designated by a federal, state, or county government as injurious to public

health, agriculture, recreation, wildlife, or property. The control of noxious weeds is regulated by the Vermont Agency of Agriculture.

#### **4.4.2 Effects of SBE's proposed project**

The project site is approximately 10 acres (4 hectares) (SBE, 2009). Grading the site for construction would directly impact approximately 4 acres (1.6 hectares) of hay field. Although this would be a loss of agricultural vegetation, the site has been permitted for industrial development since 1996. Therefore, use of the land as a hay field has been secondary and impact to vegetation is negligible. Disturbed areas around the new facility would be landscaped with native vegetation. Thus, there would be negligible impacts to existing vegetation due to the small population affected and not likely to jeopardize the viability of the resources.

Noxious weeds and invasive plant species are generally found in disturbed soil conditions. Surface disturbance and construction activities could facilitate the establishment and spread of noxious weeds. Aggressive non-native species could become established if ground disturbance during construction is extensive and lengthy. However, the size of disturbance for the proposed manufacturing facility and the short length of time before the ground surface is stabilized would minimize the risk of noxious weeds becoming established and therefore any potential impacts would be negligible.

Preventive measures such as monitoring and eradication would be implemented to reduce weeds from emerging after ground disturbance occurs. Any hay bales used to control surface runoff during construction would be certified as free from weed seeds. Heavy equipment transferring among construction sites could also introduce noxious weeds; however, because of the relatively small scale of the proposed facility, it is likely that equipment would mobilize to the site only once and thereby minimize this risk. With preventative measures implemented, the risks of invasive species should be minimized.

Overall, any changes to native vegetation would be limited to a small area and would not affect the viability of the resources. Full recovery would occur in a reasonable time, considering the size of the project and the affected resource's natural state. Therefore, impacts on terrestrial vegetation would not be expected to exceed the significance threshold.

#### **4.4.3 Effects of No-Action**

Site conditions would remain unchanged under the No-Action Alternative. The surface soils would not be disturbed for construction and existing agricultural vegetation would not be removed. Because the site is permitted for industrial development, the vegetation would likely be disturbed at some future time.

#### **4.4.4 Cumulative Effects**

Conversion of agricultural land to industrial development would have a cumulative effect to native vegetation in the area; however, there are no reasonably foreseeable projects in the vicinity that would have such an effect with SBE's proposed project. Cumulative impacts from

the proposed project when added to other past, present, and reasonably foreseeable future actions would be minimally adverse and would not be expected to exceed the threshold of significance.

## **4.5 Wildlife**

### **4.5.1 Description**

Wildlife that could typically be found in an agricultural/urban interface area, similar to the project area, include white-tailed deer, coyote, fox, rabbit, porcupine, chipmunk, squirrel, skunk, and different species of mice, moles, shrews, and bats. Avian species may include passerines (such as sparrows, wrens, finches, warblers, swallows, and meadowlarks), doves, woodpeckers, crows, ravens, and raptors (hawks and owls). Ruffed grouse may be found in adjacent wooded areas. The lack of water sources on the property would limit the presence and density of reptile and amphibian species such as turtles, salamanders, and frogs.

Most birds are protected by the Migratory Bird Treaty Act that prohibits the destruction of active nesting habitat. The hay fields on the industrial park may provide habitat for foraging and nesting for grassland birds such as sparrows and meadowlarks.

### **4.5.2 Effects of SBE's Proposed Project**

Construction activities would displace common wildlife species that inhabit or use the area for forage or cover and potentially cause direct mortality of less mobile species. Similar habitat on adjacent agriculture land would support the displaced species and thus potential impacts would be negligible. The typical species that could be impacted are widely distributed and thus loss of some individuals and habitat would not impact the populations throughout their range. Thus, there would be negligible impacts to existing wildlife due to the small population affected and not likely to jeopardize the viability of the resources.

Construction activities would displace any birds foraging or roosting in the hayfields on the industrial park property; however, potential impacts would be negligible because of available adjacent habitat and the mobility of the species. If clearing and grading activities are scheduled to occur during breeding season (generally April through August), the construction area should be surveyed to confirm the absence of nests and nesting activity. Construction would be curtailed around active nests (containing eggs or young) until the nests are no longer active or the young birds have fledged. The area to be avoided would be appropriate to the species present.

Overall, any impacts on wildlife from SBE's proposed project would be limited to a small portion of the population and would not affect the viability of the resource. Full recovery would occur in a reasonable time, considering the size of the project and the affected species' natural state. Therefore, overall impacts on wildlife would not be expected to exceed the significance threshold.

### **4.5.3 Effects of No-Action**

The No-Action Alternative would not impact wildlife in the area. No construction that would disturb habitat or displace wildlife species would occur.

### **4.5.4 Cumulative Effects**

Conversion of agricultural land to industrial development would have a cumulative effect to wildlife species in the area; however, there are no reasonably foreseeable projects in the vicinity that would have such an effect with SBE's proposed project. Cumulative impacts from the proposed project when added to other past, present, and reasonably foreseeable future actions would be minimally adverse and are not expected to exceed the threshold of significance.

## **4.6 Threatened and Endangered Species**

### **4.6.1 Description**

A species listed under the ESA is so designated because of danger of its extinction as a consequence of economic growth and development without adequate conservation. The Indiana bat (*Myotis sodalis*) is a federally listed species known to occur in the State of Vermont. It was listed as endangered by the U.S. Fish and Wildlife Service under the Endangered Species Preservation Act of 1966 and was extended full protection under the ESA of 1973. The Indiana bat is also listed by the State of Vermont as endangered.

The northern most location for maternity colony habitat for the Indian bat is in Vermont in Chittenden County and near the Town of Middlebury (USFS, 2009). Females form maternity colonies under the loose bark of trees or in tree cavities during the summer. The summer range is limited to the southern Champlain Valley along the western border of Vermont (VANR, 2008b).

### **4.6.2 Effects of SBE's Proposed Project**

The known summer range of the Indiana bat in Vermont is over 50 miles (80 km) to the west of the project area. Construction activities for the new facility would not directly disturb any forested areas that could potentially be suitable roosting or foraging habitat. Because of the distance to known habitat and no disturbance to potential habitat, the proposed project would not affect the Indiana bat. USFWS concurred with the determination of no impacts to threatened and endangered species (Appendix B). Unless a discovery of previously unknown threatened and endangered species occurs, impacts from implementing this alternative would be expected to be less than the significance threshold.

### **4.6.3 Effects of No-Action**

There would be no construction and no potential to impact suitable Indiana bat habitat. Therefore, the No-Action Alternative would not affect the Indiana bat.



#### **4.6.4 Cumulative Effects**

Because SBE's proposed project would have no effect to the Indiana bat, it would not contribute to any cumulative effects on the species due to loss of potential habitat from other development in the project area. Cumulative impacts from the proposed project when added to other past, present, and reasonably foreseeable future actions would be minimally adverse and are not expected to exceed the threshold of significance.

#### **4.7 Socioeconomic Resources**

Socioeconomic factors describe the local demographics, economy, and employment that could be influenced by SBE's proposed project.

##### **4.7.1 Description**

The new manufacturing facility proposed by SBE would be built in the existing Wilson Industrial Park, which is near the company's existing complex in Barre, Vermont, central Vermont's largest municipality. Barre, located in Washington County, Vermont, had a 2000 population of 9,291 (Census, 2000a).

The economy of Barre is dominated by educational services, health care and social assistance, which employed 22% of the labor force in 2000. Retail trade employs 14%, manufacturing employs 12%, and public administration employs 11% of the employed workforce (Census, 2000b). The most current official unemployment data puts the State unemployment rate at 6.5% in October 2009, well below the national average of 9.5% (BLS, 2009a).

##### **4.7.2 Effects of SBE's Proposed Project**

SBE's proposed project would involve constructing a 52,800 ft<sup>2</sup> (4,905 m<sup>2</sup>) manufacturing facility. This action would generate minor increases in economic activity in the following ways:

- (1) The construction of the facility would be expected to create from 20-30 full-time-equivalent (FTE) construction jobs over the 8-12 months of construction. Project proponents estimate capital construction costs of approximately \$6.2 million and a construction labor cost of approximately \$1.7 million. Roughly, 80% of capital construction costs—\$4.9 million—and all of the labor costs would be spent on construction goods and services within the regional economy.
- (2) Once operational, the facility would be expected to produce 100 FTE operational and maintenance positions. The addition of these permanent manufacturing jobs to the community would have a positive impact on economic activity in the region, as the salaries and wages paid to facility staff flow through the local and regional economy in the purchase of goods and services.
- (3) The sale of manufactured products creates employment both "backwards"—in mining and construction—and "forward", in the transportation, finance and wholesale trade sectors. The

U.S. Department of Commerce estimated that every dollar in final sales of manufactured products supports \$1.37 in other sectors of the economy (NAM, 2006).

(4) Increase in Vermont export market sales to out-of-state automotive manufacturers.

NETL anticipates that both the temporary construction jobs and the ongoing operations jobs could be filled from local or nearby communities. Therefore, SBE's proposed project would not require an influx of workers and employees that could increase the population, change the demographics of the project area, or potentially overburden finite community resources, such as schools, housing, health facilities, or law enforcement capabilities; therefore, while the potential economic impacts would be beneficial, the overall impact should be considered less than significance threshold.

#### **4.7.3 Effects of No-Action**

If the construction facility were not built, the opportunity to create short-term construction jobs, long-term manufacturing jobs, and the benefits of resulting economic activity would be lost, which would be less than the significance threshold because this alternative would represent a lost opportunity for a relatively small number of jobs and income in the community. Thus, this alternative would not worsen current conditions. Therefore, the impacts would be less than the significance threshold.

#### **4.7.4 Cumulative Impacts**

SBE's proposed project would not add to local economic development pressures in the Barre community, since the new facility is proposed within the existing Wilson Industrial Park footprint. Also, cumulative economic impacts are unlikely because SBE's proposed project is not large enough to result in enough increased demands for goods and services to trigger further economic development, and because there are no other planned or reasonable foreseeable projects affecting the same resources. Therefore, the cumulative impacts would be less than the significance threshold.

### **4.8 Infrastructure/Utilities**

Characterization of the infrastructure and utilities within the project area focuses on the ability of these elements to serve existing demand as well as any increase that may result from implementation of SBE's proposed project.

#### **4.8.1 Description**

Traffic in Barre is generated primarily by personal operating vehicles. Roadways are predominately paved two- or four-lane asphalt. Regional access to Barre is provided by Interstate 89 (I-89) from the north and south, with state routes 62 and 63 providing east-west access to I-89. Interstate 91 (I-91) travels south to north from Massachusetts to Canada, approximately 20 miles east of Barre. Travelers would approach and access the site most efficiently via Route 63 once entering the area, and depending on their point of origin, could

approach via Route 302. The site itself is at the end of Parker Road. There are no utility transmission lines within the boundaries of the proposed site.

#### **4.8.2 Effects of SBE's Proposed Project**

Short- and long-term minor adverse effects on transportation infrastructure and utilities would be expected from implementing SBE's proposed project. The changes would be due to construction vehicles and small changes in localized traffic patterns from the additional personnel. The project would not noticeably affect or disrupt the normal or routine functions of public institutions, roads, electricity, and other public utilities and services in the project area.

Traffic would increase because of additional construction vehicles and traffic delays near the construction site. These effects would be temporary in nature and would end with the construction phase. The local roadway infrastructure would be sufficient to support any increase in construction vehicle traffic. Such effects would be minimized by placing construction staging areas where they interfere with traffic the least. All construction vehicles would be equipped with backing alarms, two-way radios, and Slow Moving Vehicle signs when appropriate.

Access to the site would be through both the Pitman Road and Bolster Road connections to Parker Road. This would result in effects that are more noticeable on streets near the site than on any of the regional roadways. The roadway is being extended and connected to Bolster Road to the east, and surface parking will be provided for all employees. SBE's proposed project would introduce approximately 100 permanent employees at the proposed bus capacitor facility. These personnel would constitute approximately 334 more vehicle trips per normal weekday, and fewer on the weekend (ITE, 2003). Only a fraction of these trips would occur during peak traffic periods. This small increase in traffic would not affect the capacity of any of nearby roadway segments or intersections. These effects would be minor. Moderate changes in the number of additional personnel would not substantially change the number of daily trips, the times of travel, or the level of impact under NEPA.

Because the employees would be within driving distance of the proposed bus capacitor facility, SBE's proposed project would have negligible effect on public transit, rail, bus, or air traffic in the area. Parking would be adequate for the additional personnel.

The site would require utility upgrades and services to support the proposed facility, primarily electrical in nature. In the final design stages, all upgrades would be reviewed carefully to ensure compatibility with the site as well as local zoning ordinances. There would be limited potential to alter or disturb power or other infrastructure services to the area because of the proposed project. These impacts would be minor and below the significance threshold.

#### **4.8.3 Effects of No-Action**

Selecting the No-Action Alternative would result in no impact to infrastructure and utilities. No construction or changes in facility operations would take place. Conditions would remain unchanged when compared to the existing conditions.

#### 4.8.4 Cumulative Impacts

Cumulative impacts would not be anticipated in association with the SBE’s proposed project. There are no planned or reasonably foreseeable actions for the project area which when added to the effect of the proposed project would substantially change local road use or traffic patterns. There would be limited potential to alter or disturb power or other infrastructure services to the area due to the SBE’s proposed project. These impacts would be negligible, which would be less than the significant threshold.

#### 4.9 Noise

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, the distance between the noise source and the receptor, receptor sensitivity, and time of day.

Sound varies by both intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz (Hz) are used to quantify sound frequency. The human ear responds differently to different frequencies. A-weighting, described in a-weighted decibels (dBA), approximates this frequency response to express accurately the perception of sound by humans. Sounds encountered in daily life and their approximate levels in dBA are provided in Table 4.9.

<b>Table 4.9. Common Sounds and Their Levels</b>		
<b>Outdoor</b>	<b>Sound level (dBA)</b>	<b>Indoor</b>
Snowmobile	100	Subway train
Tractor	90	Garbage disposal
Noisy restaurant	85	Blender
Downtown (large city)	80	Ringling telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Source: (Harris, 1998)

The dBA noise metric describes steady noise levels. Very few noises are, in fact, constant, so a noise metric, day-night sound level (DNL) has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to nighttime levels (10 p.m. to 7 a.m.). DNL is a useful descriptor for noise because it averages ongoing yet intermittent noise, and it measures total sound energy over a 24-hour period. In addition, equivalent sound level ( $L_{eq}$ ) is often used to describe the overall noise environment.  $L_{eq}$  is the average sound level in dB.

The Noise Control Act of 1972 (Public Law (P.L.) 92-574) directs federal agencies to comply with applicable federal, state, interstate, and local noise control regulations. In 1974, the EPA provided information suggesting that continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals. Vermont has no statewide noise regulation. The City of Barre maintains a general nuisance noise ordinance. The code, however, does not set explicit not-to-exceed sound levels (Barre Municipal Code 4.3.04 – Zoning Conditional Use).

#### 4.9.1 Description

Existing sources of noise near the proposed site include local road traffic, rail traffic, high aircraft overflights, and natural noises such as leaves rustling and bird vocalizations. The site is one-quarter mile south of Route 302, a two-lane regional roadway, and is adjacent to an active rail spur. The nearest airfield is Edward F Knapp State Airport (MPV) and is 4 miles west of the site.

Existing noise levels (DNL and  $L_{eq}$ ) were estimated for the proposed site and surrounding areas using the techniques specified in the *American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound Part 3: Short-term measurements with an observer present* (ANSI, 2003). Table 4.9.1 outlines the closest noise-sensitive areas such as residents, schools, churches, and hospitals, and the estimated existing noise levels at each location. Notably, the area is primarily industrial/commercial and there are no residences, churches, schools, or hospitals within 1,500 feet (ft) (about 457 meters (m)) of the site.

Closest noise-sensitive area			Estimated existing sound levels (dBA)		
Distance	Direction	Type	DNL	$L_{eq}$ (Daytime)	$L_{eq}$ (Nighttime)
1600 ft (500 m)	Southwest	Suburban Residential	55	53	47
1950 ft (600 m)	North				

Source: (ANSI, 2003)

#### 4.9.2 Effects of SBE’s proposed project

Short-term minor and long-term moderate adverse effects on the noise environment would be expected. Noise levels would not exceed federal, state, or local noise standards. Increases in noise would be from heavy equipment during construction. Noise from facility operations would be minor to moderate due to the heavy machinery that is expected to be placed outside of the proposed building.

The SBE’s proposed project would require the construction of new facilities at the site. Individual pieces of construction equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet (15 m) (Table 4.9.2). With multiple items of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within

several hundred feet of active construction sites. The zone of relatively high construction noise levels typically extends to distances of 400 to 800 feet (120 to 240 m) from the site of major equipment operations. There are no residences closer than 800 feet (240 m) to the site that would experience appreciable amounts of construction noise. Given the temporary nature of the construction, and the distance to the nearest sensitive receptor, these effects would be minor.

<b>Construction phase</b>	<b>dBA L<sub>eq</sub> at 50 ft (15 m) from source</b>
Ground Clearing	84
Excavation, Grading	89
Foundations	78
Structural	85
Finishing	89

Source: (USEPA, 1974)

Although construction-related noise effects would be minor, contractors would limit construction to occur primarily during normal weekday business hours, and properly maintaining construction equipment mufflers. It is not expected, therefore, that construction noise would violate the local noise ordinance. Noise effects on construction personnel could be limited by ensuring that all personnel wear adequate personal hearing protection to limit exposure and ensure compliance with federal health and safety regulations.

Operation of the proposed bus capacitor facility would include a filtration unit for the thermal end spray (TAFAs) system, which would be located outside the building. The TAFAs Dust Control System would contain two 10 horsepower blowers drawing 4,000 cubic feet per minute each. The unit would be 85 dBA or less at 90 feet and would attenuate rapidly thereafter. At the nearest residence (1,600 feet), the sound level would be approximately 61 dBA. To conform to the Barre nuisance noise ordinance and zoning regulations, SBE would minimize, insofar as practical, any adverse impact noise levels of the immediate surroundings. These effects would be minor to moderate and below the significance threshold.

### 4.9.3 Effects of No-Action

Selecting the No-Action Alternative would result in no effect on the ambient noise environment. No construction would be expected. Ambient noise conditions would remain as described in Section 4.9.1.

### 4.9.4 Cumulative Impacts

SBE's proposed project would introduce short-term and long incremental increases to the noise environment. These changes would have a minor cumulative effect to noise for areas adjacent to the proposed facility. However, taken as a whole, cumulative impacts from the proposed project when added to other past, present, and reasonably foreseeable future actions would be minimally adverse and are not expected to exceed the threshold of significance.

## **4.10 Human Health and Safety**

### **4.10.1 Description**

Air pollution causes human health problems. Air pollution can cause breathing problems; throat and eye irritation; cancer; birth defects; and damage to immune, neurological, reproductive, and respiratory systems (USEPA, 2009b). National and state ambient air quality standards represent the maximum allowable atmospheric concentrations that may occur while still protecting public health and welfare with a reasonable margin of safety (See Section 4.1). In addition, OSHA regulations specify appropriate protective measures for all employees.

Spills from the construction of SBE's proposed project and its operation could also be a source of possible impacts to human health and safety. Spills can introduce soil contamination and allow exposure pathways to workers and the public. The risks and effects of a spill depend on its composition and extent of pollution. Similarly, waste management also is a source of possible human health and safety risks from exposure to contaminants (See Section 4.11).

A primary concern to human health and safety within the project area would be industrial accidents. Although the proposed project would be using innovative technology, the new building construction and operation would not present unusual risks for the workers due to the BMPs and safety protocols present and the similar nature to the tasks already occurring. Thus, the workers on the project would be subject to the same types of health risks that are generally associated with their professions. The most fatalities of any industry in the private sector in 2008 occurred in the construction industry with 404 deaths in 2008 (BLS, 2009b). The construction incident rate of total recordable cases of non-fatal occupational injuries and illnesses in 2008 was 4.7 per 100 full-time workers. The motor vehicle electrical and electronic equipment manufacturing industry had an incidence rate of total recordable cases of non-fatal occupational injuries and illnesses in 2008 of 3.7 per 100 full-time workers (BLS, 2009c).

### **4.10.2 Effects of SBE's Proposed Project**

The objective of the proposed project, as addressed in Chapter 2 of this EA is for SBE, Inc. to construct and qualify a state of the art Direct Current Bus Capacitor facility, which is capable of meeting a 100,000 Electric Drive Vehicle production capacity level. If SBE's proposed project were implemented, all personnel would be trained on the manufacturing processes and production equipment that they would be performing. Many of SBE's training programs would be vendor supplied due to the specific nature of the training related to the proper operation of the equipment. A few examples of the vendor related training are: operator training for the end spray equipment and dust collector operation, training on the operation and maintenance of the cure ovens, training for liquid mixing and dispensing equipment.

An all new safety program would be created for the new facility. It would be similar to the one utilized at the existing facility, sharing only the document framework and layout. The plan would address various scenarios such as fire, explosion, and material spills. No process-type gasses are envisioned for this type of manufacturing; therefore, the threat of a gas release has been removed.

If SBE's proposed project is implemented, the equipment and operations used in the project should only present minimal risks to human health and safety when operated under normal conditions. Thus, if BMPs, maintenance, and regulations are followed, the equipment should pose little threat to human health and safety. All personnel would be trained regarding the safety measures and procedures (such as handling hazardous materials) associated with the job. All necessary safety equipment would be worn during operating hours or while on the premises. If necessary, the SBE safety manuals would be updated. By following safety protocols and other measures, occupational hazards would be minimized.

Since all of the construction and operation of SBE's proposed project would be on SBE property, the increase in traffic from workers and delivery of equipment and materials would be partially limited to onsite, which reduces risk to pedestrians and the general public. However, the proposed project would still represent an increase in traffic, which increases the potential for accidents. The current roads near the sites should be able to handle the increase in vehicles associated with this project. Thus, the impact to human health and safety from the increase in transportation would be expected to be less than the significance threshold (See Section 4.8).

Air emissions from SBE's proposed project are anticipated to be less than significant (See Section 4.1). Thus, the impacts to human health from air emissions would not be expected to exceed the significance threshold. Following mitigation measures and BMPs would reduce any impacts to human health from air quality. Further, workers would follow OSHA procedures, which would further reduce the impact to human health. Therefore, there would be a minimal risk to human health and safety as long as safety procedures are followed.

The soils are not highly erodible (See Section 4.2); therefore, water contamination from increased runoff, which could lead to human health and safety risks, is not a major issue (See Section 4.3). If significant changes were to occur to stormwater runoff, a new or modified NPDES permit would be required. Further, wastewater would be collected and treated according to applicable regulations and by qualified personnel (Section 4.3.2). Therefore, the overall effect of SBE's proposed project to surface water quality is not expected to exceed the significance threshold.

If safety procedures and BMPs were followed, spills and leaks from equipment and processes (other than the hazardous wastes) would be of low concentrations as well as nonhazardous and not toxic. This would represent a low risk to human health and safety. Under normal conditions, hazardous and toxic materials can be used safely when appropriate safety precautions are followed. Some hazardous materials would be used/created during the project but in quantities small enough not to affect the small generator status. All generated waste materials would be handled and disposed in accordance with applicable regulations.

With regard to the handling of hazardous materials, SBE would effectively control chemicals and exposure through hazardous materials control programs developed to protect health, safety and the environment. Procedures would include chemical right-to-know regarding the chemicals in operations, need and use of personal protective equipment, lock out tag out, hearing protection, electrical hazards, eye protection, respirator fit and use, etc.



Appropriate monitoring equipment and systems that are consistent with all BMPs and regulations would be in place for the materials and wastes produced. This operating procedure would detect leaks and equipment malfunctions to ensure the safety of the workers and allow appropriate early responses to any problems. This would reduce the risk to human health and safety on the site as well as in the local community. As a further precaution, and when necessary as required by regulatory mandate, the local communities and other relevant agencies would be notified of the materials present so that appropriate emergency plans could be modified.

Facility decommission would represent the same types of risks as the operation. Thus, with proper safety procedures, the impact to human health and safety should be minimal. Appropriate BMPs and adherence to regulations would minimize the risks present with project implementation. Therefore, the overall impact to human health and safety would be not expected to exceed the significance threshold.

#### **4.10.3 Effects of No-Action**

Under the No-Action Alternative, there would be no construction, operation, or decommissioning of the proposed project. Thus, none of the risks listed in the previous section would occur, which would mean no impacts to human health and safety. The exception would be the fact that the proposed project's purpose, which is to further the research for advanced battery component manufacturing and provide economic stimulation, would not be implemented. However, many other projects are in operation or are being proposed to assist in the EDV technology and stimulate the economy. Thus, not all possible issues with delaying the advancement of EDV research and economic stimulation are attributable to implementing the No-Action Alternative (DOE refusing to fund SBE's proposed project) for this project. Nevertheless, while the No-Action Alternative does represent some risk to human health and safety by not facilitating the construction and operation of a DC Bus Capacitor facility, implementation of the No-Action Alternative would be below the significance threshold.

#### **4.10.4 Cumulative Effects**

The cumulative impacts of existing activities in and around the project area do not represent a substantial risk to human health and safety with existing and upcoming mitigation and safety procedures in place. Further, the proposed project would contribute minimally to cumulative impacts due to the minimal risk to human health and safety with BMPs in place. Therefore, the cumulative impacts with implementing SBE's proposed project would not be expected to exceed the significance threshold.

Since the current projects in the area do not pose a substantial risk to human health and safety, the No-Action Alternative does not represent any additional risks to human health and safety. As described in the previous section, the exception is that not implementing SBE's proposed project (thus, implementing the No-Action Alternative) would have an adverse impact on progress towards solutions for electric drive component manufacturing and economic stimulation. However, since this is a single project of many, the cumulative impacts to human health and safety for the No-Action Alternative are not expected to exceed the threshold of significance.

## **4.11 Waste Management**

### **4.11.1 Description**

The SBE facility generates less than 100 kilograms (220 pounds) of hazardous waste per month and thus meets the conditionally exempt small quantity generator (CESQG) status under the Resource Conservation and Recovery Act regulations. The SBE facility meets the requirements of CESQG by identifying all hazardous waste generated, accumulating no more than 1,000 kilograms (2,200 pounds) on site at any time, and ensuring the hazardous waste is transported off-site to a treatment or disposal facility.

Most of the non-hazardous materials associated with the SBE facility operations are recycled (E. F. Wall & Associates, 2009). Types of non-hazardous solid waste would generally include office trash, scrap metal by-products, and packaging and shipping materials. Materials not recycled are collected as solid waste by Casella Waste Systems and transported to a transfer station near Rutland, Vermont.

### **4.11.2 Effects of SBE's Proposed Project**

Construction activities present the potential to encounter previously unidentified contaminated soils or groundwater. Based on a database search of known locations of hazardous sources and reported activity, the likelihood of encountering contamination is low and impacts from contaminants expected during construction would be negligible. Small amounts of potentially hazardous waste materials (e.g., waste oils, lubricants, solvents, cleaners, paints) would be generated during construction, but proper use and storage of the materials would ensure no impact to workers and the environment. Use or storage of hazardous materials on site during construction would be in accordance with applicable regulations, and appropriate spill prevention measures would be implemented. If hazardous materials are spilled or deposited on the site during or after construction, the responsible party would immediately notify appropriate regulatory parties, take all necessary actions to clean up and properly dispose of the materials, and complete all reporting requirements.

The principal hazardous materials that would be used at the new facility include flux, rubbing alcohol, epoxies, and metal cleaning agents. These materials would be stored as suggested by the manufacturers or required by Material Safety Data Sheets to prevent spills or releases.

Operation of the new manufacturing facility is not expected to generate hazardous waste of a different type or amount than what is currently generated at the SBE facility, and therefore, no change to SBE's status as a CESQG is anticipated. The manufacturing process involves no materials that have the potential to contaminate surface soils, surface water, or groundwater if released or discharged (SBE, 2009). No permit from or registration with the Vermont Agency of Natural Resources Hazardous Materials Management Program is necessary for the new facility and manufacturing process (E.F. Wall & Associates, 2009). SBE's emergency response procedures and spill contingency plans would be revised to include the new facility and new manufacturing process.

Increases in office trash are expected with the additional 100 employees expected to operate the new facility. Non-hazardous solid waste generated by the new manufacturing process would be approximately 5 tons (4.5 metric tons) annually (SBE, 2009) or approximately 0.02 ton (0.02 metric ton) average daily volume. The amount of solid waste requiring disposal by the new manufacturing process would have a negligible impact on the volume received at the transfer station for disposal in a landfill. Therefore, overall impacts to waste management from implementing this alternative would be expected to be less than the significance threshold.

#### **4.11.3 Effects of No-Action**

The new manufacturing facility would not be constructed under the No-Action Alternative. There would be no new manufacturing processes affecting the management of existing hazardous and solid waste at the SBE facility.

#### **4.11.4 Cumulative Impacts**

Increased manufacturing of parts for electric drive vehicles would have a cumulative beneficial effect on the environment from improved electric drive vehicles. There are no reasonably foreseeable projects in the vicinity that would have similar effects as SBE's proposed project. Cumulative impacts from the proposed project when added to other past, present, and reasonably foreseeable future actions would be minimally adverse and would not be expected to exceed the threshold of significance.

### **4.12 Land Use**

#### **4.12.1 Description**

The proposed SBE site is in the existing Wilson Industrial Park in Barre, Vermont. The proposed site is currently being used for hay and corn production (Gordon, 2010). However, the permit from 1996 states this use would cease once the sites in the park are developed (Vermont, 1996). Other nearby uses include industrial, agriculture, and forestland.

#### **4.12.2 Effects of SBE's Proposed Project**

If SBE's proposed project were implemented, the proposed construction of an approximately 52,800 ft<sup>2</sup> (4,905 m<sup>2</sup>) building with 3.89 acres (1.57 hectares) in total project footprint, which includes the new building, parking, and driveways, at the proposed Barre site would occur. This construction, as well as associated operational activities, would be compatible with current land use at that the Barre site as they would consist of similar types of activities to those being currently conducted in the existing permitted and zoned industrial park. Further, the proposed project would be implemented in such a way as to ensure avoidance and mitigation of any land use issues at that site. While some farmland would be displaced, the conversion of farmland to industrial use is planned and permitted, so this minimizes impacts to land use (Vermont, 1996). Consequently, the project does not require any zoning changes. Additionally, there are no prime farmlands at the site. Moreover, the nearest park is Ainsworth State Park, which is six miles

(about ten kilometers (km)) southwest. Thus, the proposed project is unlikely to impact parks and recreation. The closest Class I Area is Dry River Wilderness, which is 50 miles (80 km) east. Due to the project being a new building in an industrial zoned area with existing similar buildings and the distance to the nearest Class I area, it is also unlikely to impact visual resources more than negligibly. Therefore, because this conversion of farmland in an existing and permitted industrial park is a planned change, the impacts from implementing this alternative are expected to be less than the significance threshold.

#### 4.12.3 Effects of No-Action

Under the No-Action Alternative, the site at Barre, Vermont would continue current uses and ownership of a hayfield and cornfield (Gordon, 2010). Thus, continuing this current use would result in no impacts to land use except to not fulfill the planned and intended use of the area for an industrial park, which would be less than the significance threshold.

#### 4.12.4 Cumulative Impacts

Other land use development in the industrial park or nearby would occur according to permits and regulations. Under the No-Action Alternative, the land would remain in hay and corn production, which would have a negligible contribution to cumulative land use impacts as this has occurred since 1996 (Vermont, 1996). This proposed project would expand industrial development in this industrial park, so cumulative impacts would likely be minor with regard to most unplanned development that may occur in this area, which should be considered compatible with the current industrial nature and the planned and permitted use of the land.

### 4.13 Sustainability

Executive Order (EO) 13541 on Federal Sustainability issued on 5 October 2009, states in part that it is the **policy** of the Federal government “*to create a clean energy economy*” and that “*Federal agencies shall increase energy efficiency; measure, report, and reduce their greenhouse gas emissions from direct and indirect activities; conserve and protect water resources through efficiency, reuse, and stormwater management; eliminate waste, recycle, and prevent pollution; ... design, construct, maintain, and operate high performance sustainable buildings in sustainable locations; and strengthen the vitality and livability of the communities in which Federal facilities are located.*”

Section 2(f)(iv) of the EO states that each agency shall “*advance regional and local integrated planning by ... identifying and analyzing impacts from energy usage and alternative energy sources in all Environmental Impact Statements and Environmental Assessments for proposals for new or expanded Federal facilities under the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.).*”

The proposed project reviewed by this EA is part of a larger national effort to move this country to a more sustainable future. Efforts are underway to begin the move from non-renewable fuel sources to renewable fuel sources to power our economy. A major part of that non-renewable fuel use is in personnel transportation and the use of internal combustion engines in our

automobiles. A move to electric vehicles can be seen as a very visible move to a more sustainable future.

The action proposed and reviewed in this EA is a part of the national move to a sustainable future. If SBE's proposed project were initiated, SBE would work diligently with design engineers on building specifications and efficiency to build a state of the art building with the following efficiency items among others:

1. Low Water Usage Toilets and Urinals
2. All Mechanical Heating, Ventilation, & Air Conditioning (HVAC) units would be equipped with economizers (Economizers use external air, when applicable, to meet the desired internal temperature requirements instead of using the unit to heat or cool air, thus saving energy.)
3. All HVAC equipment to be highly efficient beyond just using economizers
4. All lighting would be the most efficient available
5. Roof, wall, and foundation insulation would be of quality that helps with the sustainability of the building.
6. Use of Exterior window glazing

## **5.0 CONSULTATION AND COORDINATION**

A kick-off meeting was held on October 20, 2009, at NETL's office in Morgantown, West Virginia, with representatives from NETL and Mangi Environmental Group to begin formally the EA process. Subsequent to that meeting, a review was made of available information necessary for the completion of the EA and data gaps were sent to NETL and SBE.

### **5.1 Agency Coordination**

The CEQ's regulations for implementing NEPA allows federal agencies to invite comment from Tribal, state, and local agencies, as well as other federal agencies in the preparation of EAs. The purpose of this coordination is to obtain special expertise with respect to environmental and cultural issues in order to enhance interdisciplinary capabilities and otherwise ensure successful, effective consultation in decision-making. The below entities were contacted for this effort.

#### **5.1.1 U.S. Fish and Wildlife Service (USFWS)**

The mission of the USFWS is to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of American people. Consultation with USFWS also assists with the Endangered Species Act compliance.

See Appendix B for correspondence with this agency.

#### **5.1.2 State Historic Preservation Office (SHPO)**

The National Historic Preservation Act (NHPA) requires DOE to consult with the SHPO prior to any construction to ensure that no historical properties would be adversely affected by a proposed project. DOE must also afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed project.

See Appendix C for correspondence with this agency.

#### **5.1.3 Bureau of Indian Affairs**

The American Indian Religious Freedom Act, 42 USC § 1996, establishes policy to protect and preserve the inherent and Constitutional right of Native Americans to believe, express, and exercise their traditional religions. The law ensures the protection of sacred locations; access of Native Americans to those sacred locations and traditional resources that are integral to the practice of their religions; and establishes requirements that would apply to Native American sacred locations, traditional resources, or traditional religious practices potentially affected by construction and operation of proposed facilities.

See Appendix D for correspondence with the Bureau of Indian Affairs and Tribal Councils.

## **5.2 Public Involvement**

The public comment period on the Draft EA was from February 21 to March 23, 2010. An article informing the public of the availability of the Draft EA at the Aldrich Public Library in Barre, VT ran February 21 to February 23, 2010 in Times Argus. DOE received no public comments.

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## 8.0 GLOSSARY

**Air-Quality Control Region** - A contiguous area where air quality is relatively uniform. AQCRs may consist of two or more cities, counties or other governmental entities, and each region is required to adopt consistent pollution control measures across the political jurisdictions involved.

**Ambient** - The natural surroundings of a location.

**Anode** - The terminal to which an electron flows.

**Attainment Areas** - A zone within which the level of a pollutant is considered to meet United States National Ambient Air Quality Standards.

**Average Poverty Threshold** - The maximum amount of annual income permitted for a family of four as of 2008, which is \$22,025 or less.

**A-Weighted Decibels** - An expression of the relative loudness of sounds in air as perceived by the human ear.

**Best Management Practices** - Methods or techniques found to be the most effective and practical means in achieving an objective (such as preventing or minimizing pollution) while optimally using the firms resources.

**Capacitor** - A device that is utilized to produce an electric field and regulate electric currents.

**Capital Construction Costs** - The initial necessary expenditures required to begin construction including mechanical equipment, land, etc.

**Cathode** - The terminal from which current flows.

**Channelization** - The process of eliminating sinuosity and decreasing channel length by therefore creating a straight path of flow.

**Chemical Right-To-Know** - Occupational Safety and Health Administration information regarding chemical data and hazards communicated through Material Safety Data Sheets.

**Clean Air Act (CAA)** - Legislation enacted to monitor and control air pollution therefore improving air quality.

**Confluence** - The area where two or more streams meet to form one larger flowing body of water.

**Criteria Pollutants** - Six primary air pollutants found throughout the United States as defined by USEPA pursuant to the Clean Air Act. They include particulates, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead.

**Cumulative Effects** - Those effects on the environment that result from the incremental effect of the action when added to past, present and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions.

**Day-Night Sound Level** - The A-weighted equivalent sound level for a 24 hour period with an additional 10 dB imposed on the equivalent sound levels for night time hours of 10 p.m. to 7 am.

**Decibel** - A unit of measurement that expresses the magnitude of a physical quantity (usually intensity) relative to a specified or implied reference level. The decibel is useful for a wide variety of measurements in science (for this application, it is sound).

***De Minimis*** - Of minimal importance.

**Diversity** - The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

**Environmental Assessment (EA)** - A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).

**EDV** - Electric drive vehicle.

**Environmental Impact Statement (EIS)** - A detailed written statement required by Section 102(2) (C) of the National Environmental Policy Act, analyzing the environmental impacts of a Proposed Action, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources (40 CFR 1508.11).

**Electrolytes** - In chemistry, an electrolyte is any substance containing free ions that make the substance electrically conductive.

**Endangered Species** - A species that is threatened with extinction throughout all or a significant portion of its range.

**Environmental Justice** - The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic or socioeconomic group should bear a disproportionate share of the adverse environmental consequences resulting from a proposed federal action.

**Environmental Justice Population** - A population comprised of at least half minority status or at least half low-income status, or whose representation of these categories is greater than the general population in a meaningful way.

**Environmental Justice** - The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

**Equivalent Sound Level** - The level of a steady-state noise without impulses or tone components that is equivalent to the actual noise emitted over a period of time.

**Esker** - A glacial deposit of sand and gravel.

**Executive Order (EO)** - Official proclamation issued by the President that may set forth policy, direction or establish specific duties in connection with the execution of federal laws and programs.

**Fledging** - Fowl newly able to fly.

**Finding of No Significant Impact (FONSI)** - A document prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, that briefly presents why a Federal action will have no significant effect on the human environment and for which an environmental impact statement, therefore, will not be prepared (40 CFR 1508.13).

**Forage** - The search for food (v) or grasses, small shrubs and other plant material that can be used as food sources for grazing animals and livestock (n).

**Greenhouse Gas** - Gases present in the earth's atmosphere that reduce the loss of heat into space and therefore contribute to global temperatures.

**Habitat** - Suite of existing environmental conditions required by an organism for survival and reproduction. This is the location where said organism typically lives.

**Hazardous Waste/Materials** - Waste substances that can pose a substantial or potential hazard to human health or the environment when improperly managed.

**Hertz** - A unit of frequency equal to one cycle per second.

**Invasive Species** - An alien (nonnative to the ecosystem) species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

**Ion** - An atom or molecule where the total number of electrons is not equal to the total number of protons, giving it a net positive or negative electric charge.

**Laurentide Ice Sheet** - The most recent continental-scale glacier covering all of New England.

**Level of Service** - A measurement of the effectiveness of elements in transportation infrastructure. LOS is most commonly used to analyze highways, but the concept has also been applied to intersections, transit, and water supply.

**Lithium** - A soft, silver-white metal that belongs to the alkali metal group of chemical elements.

**Loam** - Soil that contains even amounts of sand and silt, while slightly less clay.

**Lock Out/Tag Out** - A safety procedure that ensures equipment disabling without the releasing stored energy.

**Lubricants** - A friction reducing substance applied on the surface of two or more mechanical objects.

**Material Safety Data Sheets** - Source of information regarding specific chemical characteristics and properties provided by OSHA.

**Melt Water** - Water released by the melting of snow or ice, including glacial ice.

**Migratory Bird Treaty Act of 1918** - Legislation enacted to protect migratory birds traveling between the United States and Canada.

**Minor New Source Review** - A program to ensure that facilities producing small amounts of pollutants remain within the threshold for minimal emissions.

**Minority** - Defined as Black or African-American, Hispanic or Latino, Asian, American Indian, Native Hawaiian or other Pacific Islander.

**Mitigation** - Methods or actions taken to improve site conditions by limiting, reducing or controlling adverse impacts to the environment.

**National Ambient Air Quality Standards** - Guidelines established by the EPA that apply to outdoor air throughout the country. Primary standards are designed to protect human health, with an adequate margin of safety, including sensitive populations such as children, the elderly, and individuals suffering from respiratory disease.

**National Emissions Standards for Hazardous Air Pollutants** - Emissions standards set by the United States EPA for an air pollutant not covered by NAAQS that may cause an increase in fatalities or in serious, irreversible, or incapacitating illness.

**Native Vegetation** - Plant life that occurs in a natural system notwithstanding human influence.

**National Environmental Policy Act (NEPA)** - Requires all agencies, including Department of Energy, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions.

Federal agencies must integrate NEPA with other planning requirements, and prepare appropriate NEPA documents to facilitate better environmental decision making (40 CFR 1500).

**National Pollutant Discharge Elimination System (NPDES)** - The national program for administering permits (and pretreatment requirements) under sections 307, 402, 318, and 405 of the Clean Water Act. The term includes state or tribal” approved programs.”

**New Source Performance Standards** - Pollution control standards issued by the EPA. The term is used in the Clean Air Act Extension of 1070 to refer to air pollution emission standards, and in the Clean Water Act referring to standards for discharges of industrial wastewater to surface waters.

**Noise** - Any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive.

**Nonattainment Areas** - The Clean Air Act and Amendments of 1990 define a "nonattainment area" as a locality where air pollution levels persistently exceed national standards or that contributes to ambient air quality in a nearby area that fails to meet standards. Designating an area as nonattainment is a formal rulemaking process, and EPA normally takes this action only after air quality standards have been exceeded for several consecutive years.

**Nonpoint Source Pollution** - Water pollution affecting a water body from diffuse sources, rather than a point source that discharges to a water body at a single location.

**Non-renewable Energy** - Sources of energy that cannot be replenished within an economically feasible timeframe, i.e. coal and oil.

**Open Burning** - The combustion of materials and subsequent release of pollutants into ambient air without a filtering process.

**Opportunistic Plants** - Vegetation that grows and reproduces without regard to particular environmental circumstances or inhibitions.

**Occupational Safety and Health Administration** - A Department of Labor Agency that establishes and enforces standards for workplace safety.

**Overburden** - The term used in mining and archaeology to describe material that lies above the area of economic or scientific interest.

**Particulate Matter** - Small solid particles and liquid droplets in the air.

**PM<sub>10</sub>** - Particulate matter less than 10 microns in diameter.

**PM<sub>2.5</sub>** - Particulate matter less than 2.5 microns in diameter.



**Potable water** - Water of sufficiently high quality so that it can be consumed or used without risk of immediate or long-term harm.

**Refurbishment** - The process of major maintenance or minor repair of an item, either aesthetically or mechanically.

**Renewable Energy** - Sources of energy produced from naturally occurring resources i.e. wind, water.

**Resource Conservation and Recovery Act of 1976** - Mandates laws for monitoring hazardous and solid waste disposal.

**Roosting** - Fowl resting periods.

**Sediment Settling Basin** - A location in which sediment from construction is stored.

**Seismic Zone 2A** - An area with moderate seismic risk.

**Significance Criteria/Threshold** - The level determined to be the indicator as to whether an action will have a significant impact.

**Soil Erosion** - The removal and loss of soil by the action of water, ice, gravity, or wind.

**Solvents** - A substance that forms a solution by dissolving another solid, liquid, or gas.

**Sound Pressure Level** - The scale used to quantify sound intensity described in decibels (dB).

**State Implementation Plan** - The state plan for complying with the federal Clean Air Act. A SIP consists of narrative, rules, technical documentation, and agreements that an individual state will use to clean up area not meeting the National Ambient Air Quality Standards.

**Storm Water Management Plan** - A plan that identifies the possible paths of contaminants into storm water runoff and methods of reducing or mitigating such contamination.

**Storm Water** - Water discharges generated by runoff from land and impervious areas such as paved streets, parking lots, and building rooftops during rainfall and snow events. Storm water often contains pollutants in quantities that could adversely affect water quality.

**The Noise Control Act Of 1972** - A directive for federal agencies in compliance with applicable federal, state, interstate, and local noise control regulations

**Till Plains** - An extensive flat plain of glacial till that forms when a sheet of ice becomes detached from the main body of a glacier and melts in place depositing the sediments.

**Tributary** - A stream or other body of water that contributes to another stream.

**Uniform Building Code** - An international standard established to ensure safety and continuity in new construction projects.

**Volatile Organic Compounds** - Chemical compounds that vaporize in normal conditions.

**Watershed** - An extent of land where water from rain or snow melt drains downhill into a body of water, such as a river, lake, reservoir, estuary, wetland, sea or ocean.

**APPENDICES**

**Appendix A Air Emission Calculations**

<b>Table A-1. Construction Equipment Use</b>				
<b>Equipment type</b>	<b>Number of units</b>	<b>Days on site</b>	<b>Hours per day</b>	<b>Operating hours</b>
<b>Excavators Composite</b>	1	115	4	460
<b>Rollers Composite</b>	1	173	8	1384
<b>Rubber Tired Dozers Composite</b>	1	115	8	920
<b>Plate Compactors Composite</b>	2	115	4	920
<b>Trenchers Composite</b>	2	58	8	928
<b>Air Compressors</b>	2	115	4	920
<b>Cement &amp; Mortar Mixers</b>	2	115	6	1380
<b>Cranes</b>	1	115	7	805
<b>Generator Sets</b>	2	115	4	920
<b>Tractors/Loaders/Backhoes</b>	2	230	7	3220
<b>Pavers Composite</b>	1	58	8	464
<b>Paving Equipment</b>	2	58	8	928

<b>Equipment</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>CO<sub>2</sub></b>
<b>Excavators Composite</b>	0.5828	1.3249	0.1695	0.0013	0.0727	0.0727	119.6
<b>Rollers Composite</b>	0.4341	0.8607	0.1328	0.0008	0.0601	0.0601	67.1
<b>Rubber Tired Dozers Composite</b>	1.5961	3.2672	0.3644	0.0025	0.1409	0.1409	239.1
<b>Plate Compactors Composite</b>	0.0263	0.0328	0.0052	0.0001	0.0021	0.0021	4.3
<b>Trenchers Composite</b>	0.5080	0.8237	0.1851	0.0007	0.0688	0.0688	58.7
<b>Air Compressors</b>	0.3782	0.7980	0.1232	0.0007	0.0563	0.0563	63.6
<b>Cement and Mortar Mixers</b>	0.0447	0.0658	0.0113	0.0001	0.0044	0.0044	7.2
<b>Cranes</b>	0.6011	1.6100	0.1778	0.0014	0.0715	0.0715	128.7
<b>Generator Sets</b>	0.3461	0.6980	0.1075	0.0007	0.0430	0.0430	61.0
<b>Tractors/Loaders/Backhoes</b>	0.4063	0.7746	0.1204	0.0008	0.0599	0.0599	66.8
<b>Pavers Composite</b>	0.5874	1.0796	0.1963	0.0009	0.0769	0.0769	77.9
<b>Paving Equipment</b>	0.0532	0.1061	0.0166	0.0002	0.0063	0.0063	12.6

Source: (CARB, 2007) Note: CO<sub>2</sub> is carbon dioxide

<b>Equipment</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>CO<sub>2</sub></b>
<b>Excavators Composite</b>	0.1341	0.3047	0.0390	0.0003	0.0167	0.0167	0.1341
<b>Rollers Composite</b>	0.3004	0.5956	0.0919	0.0005	0.0416	0.0416	0.3004
<b>Rubber Tired Dozers Composite</b>	0.7342	1.5029	0.1676	0.0011	0.0648	0.0648	0.7342
<b>Plate Compactors Composite</b>	0.0121	0.0151	0.0024	0.0000	0.0010	0.0010	0.0121
<b>Trenchers Composite</b>	0.2357	0.3822	0.0859	0.0003	0.0319	0.0319	0.2357
<b>Air Compressors</b>	0.1740	0.3671	0.0567	0.0003	0.0259	0.0259	0.1740
<b>Cement and Mortar Mixers</b>	0.0309	0.0454	0.0078	0.0001	0.0031	0.0031	0.0309
<b>Cranes</b>	0.2419	0.6480	0.0716	0.0006	0.0288	0.0288	0.2419
<b>Generator Sets</b>	0.1592	0.3211	0.0494	0.0003	0.0198	0.0198	0.1592
<b>Tractors/Loaders/Backhoes</b>	0.6542	1.2470	0.1939	0.0012	0.0964	0.0964	0.6542
<b>Pavers Composite</b>	0.1363	0.2505	0.0455	0.0002	0.0178	0.0178	0.1363
<b>Paving Equipment</b>	0.0247	0.0492	0.0077	0.0001	0.0029	0.0029	0.0247
<b>Total</b>	<b>2.84</b>	<b>5.73</b>	<b>0.82</b>	<b>0.0051</b>	<b>0.35</b>	<b>0.35</b>	<b>2.84</b>

<b>Table A-4. Painting</b>			
<b>VOC Content</b>	0.84	pounds (lbs)/gallon	
<b>Coverage</b>	400	ft <sup>2</sup> /gallon	
<b>Emission Factor</b>	0.0021	lbs/ft <sup>2</sup>	
<b>Building/Facility</b>	Wall Surface	VOC (lbs)	VOC (tpy)
<b>All Buildings Combined</b>	72000	151.2	0.076
<b>Total</b>	<b>72000</b>	<b>151.20</b>	<b>0.08</b>

<b>Table A-5. Delivery of Equipment and Supplies</b>							
<b>Number of Deliveries</b>	2						
<b>Number of Trips</b>	2						
<b>Miles Per Trip</b>	30						
<b>Days of Construction</b>	230						
<b>Total Miles</b>	27600						
<b>Pollutant</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>CO<sub>2</sub></b>
<b>Emission Factor (lbs/mile)</b>	0.0219	0.0237	0.0030	0.0000	0.0009	0.0007	0.0219
<b>Total Emissions (lbs)</b>	605.80	654.47	82.60	0.71	23.63	20.41	605.80
<b>Total Emissions (tpy)</b>	<b>0.30</b>	<b>0.33</b>	<b>0.04</b>	<b>0.0004</b>	<b>0.01</b>	<b>0.01</b>	<b>0.30</b>
Source: (CARB, 2007)							

<b>Table A-6. Paving Off Gasses</b>			
<b>VOC Emissions Factor</b>	2.62	lbs/acre	
<b>Building/Facility</b>	<b>Area (acres)</b>	<b>VOC (lbs)</b>	<b>VOC (tpy)</b>
<b>All Combined Parking</b>	0.23	0.60	0.0003
<b>Total</b>	<b>0.23</b>	<b>0.60</b>	<b>0.0003</b>
Source: (SCAQMD, 1993)			

<b>Table A-7. Surface Disturbance</b>						
<b>TSP Emissions</b>	80	lbs/acre				
<b>PM<sub>10</sub>/TSP</b>	0.45					
<b>PM<sub>2.5</sub>/PM<sub>10</sub></b>	0.15					
<b>Period of Disturbance</b>	30	days				
<b>Capture Fraction</b>	0.5					
<b>Building/Facility</b>	<b>Area (acres)</b>	<b>TSP (lbs)</b>	<b>PM<sub>10</sub> (lbs)</b>	<b>PM<sub>10</sub> (tons)</b>	<b>PM<sub>2.5</sub> (lbs)</b>	<b>PM<sub>2.5</sub> (tons)</b>
<b>Demolition</b>	1.1	2539	1143	0.57	86	0.04
<b>Total</b>	<b>1.1</b>	<b>2539</b>	<b>1143</b>	<b>0.57</b>	<b>86</b>	<b>0.04</b>

Sources: (USEPA, 1995; USEPA, 2005). Note: TSP is Total Suspended Particles.

<b>Table A-8. Worker Commutes</b>							
<b>Number of Workers</b>	30						
<b>Number of Trips</b>	2						
<b>Miles Per Trip</b>	30						
<b>Days of Construction</b>	230						
<b>Total Miles</b>	414000						
<b>Pollutant</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>CO<sub>2</sub></b>
<b>Emission Factor (lbs/mile)</b>	0.0105	0.0011	0.0011	0.0000	0.0001	0.0001	0.0105
<b>Total Emissions (lbs)</b>	4367.05	456.59	446.79	4.45	35.21	21.91	4367.05
<b>Total Emissions (tpy)</b>	<b>2.18</b>	<b>0.23</b>	<b>0.22</b>	<b>0.0022</b>	<b>0.02</b>	<b>0.01</b>	<b>2.18</b>

Source: (CARB, 2007)

<b>Table A-9. Total Construction Emissions (tons per year)</b>						
<b>Activity/Source</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>
<b>Construction Equipment</b>	2.84	5.73	0.82	0.0051	0.35	0.35
<b>Painting</b>	0.00	0.00	0.08	0.0000	0.00	0.00
<b>Delivery of Equipment and Supplies</b>	0.30	0.33	0.04	0.0004	0.01	0.01
<b>Paving Off Gasses</b>	0.00	0.00	0.00	0.0000	0.00	0.00
<b>Surface Disturbance</b>	0.00	0.00	0.00	0.0000	0.57	0.04
<b>Worker Commutes</b>	2.18	0.23	0.22	0.0022	0.02	0.01
<b>Total Construction Emissions</b>	<b>5.32</b>	<b>6.28</b>	<b>1.16</b>	<b>0.0077</b>	<b>0.95</b>	<b>0.41</b>

<b>Table A-10. Boiler Emissions</b>						
<b>Gross Area</b>	36000	ft <sup>2</sup>				
<b>Heating Requirements</b>	99000	BTU/ft <sup>2</sup>				
<b>Total Annual Heat Required</b>	3564	MMBTU				
<b>Heating Value</b>	150	MMBTU/1,000 Gallons				
<b>Total #2 Oil Used</b>	23.8	Thousand Gallons				
<b>Pollutant</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>
<b>Emission Factor (lb/1,000 gallons)</b>	5	24	2.493	0.1	2	2
<b>Total Emissions (tons)</b>	<b>0.06</b>	<b>0.29</b>	<b>0.03</b>	<b>0.00</b>	<b>0.02</b>	<b>0.02</b>
Notes: Emission factors for all pollutants were obtained from EPA's AP-42, Section 1.3. (USEPA, 1995); Conservatively assume that PM <sub>10</sub> = PM.; Assumed sulfur concentration 1%; and Heating requirements obtained from Commercial Buildings Energy Consumption Survey, DOE 2003 (DOE, 2003). Also, BTU is British Thermal Units, and MMBTU is Million British Thermal Units.						

<b>Table A-11. Worker Commutes</b>						
<b>Number of Workers</b>	100					
<b>Number of Trips</b>	2					
<b>Miles Per Trip</b>	30					
<b>Days of Work</b>	260					
<b>Total Miles</b>	1560000					
<b>Pollutant</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>
<b>Emission Factor (lbs/mile)</b>	0.0105	0.0011	0.0011	0.0000	0.0001	0.0001
<b>Total Emissions (lbs)</b>	16455.56	1720.50	1683.54	16.77	132.69	82.57
<b>Total Emissions (tons)</b>	<b>8.23</b>	<b>0.86</b>	<b>0.84</b>	<b>0.01</b>	<b>0.07</b>	<b>0.04</b>
Source: (CARB, 2007)						

<b>Table A-12. Total Operational Emissions (tons)</b>						
<b>Activity/Source</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>
<b>Boiler Emissions</b>	0.06	0.29	0.03	0.00	0.02	0.02
<b>Worker Commutes</b>	8.23	0.86	0.84	0.01	0.07	0.04
<b>Total Operational Emissions</b>	<b>8.29</b>	<b>1.15</b>	<b>0.87</b>	<b>0.01</b>	<b>0.09</b>	<b>0.07</b>

## Appendix B USFWS Consultation



**NATIONAL ENERGY TECHNOLOGY LABORATORY**  
Albany, OR · Morgantown, WV · Pittsburgh, PA



November 13, 2009

U.S. Fish and Wildlife Service  
70 Commercial Street, Suite 300  
Concord, NH 03301-5087

Subject: Proposed Power Ring Manufacturing Scale-up in Barre, Vermont

Dear Sir or Madam:

The Department of Energy's (DOE) National Energy Technology Laboratory (NETL) manages the research and development portfolio of the Vehicle Technologies (VT) Program for the Office of Energy Efficiency and Renewable Energy. A key objective of the VT program is accelerating the development and production of electric drive vehicle systems in order to substantially reduce the United States' consumption of petroleum. Another of its goals is the development of production-ready batteries, power electronics, and electric machines that can be produced in volume economically so as to increase the use of electric drive vehicles.

Congress appropriated significant funding for the VT program in the American Recovery and Reinvestment Act of 2009, Public Law 111-5 (Recovery Act) in order to stimulate the economy and reduce unemployment in addition to furthering the existing objectives of the VT program. NETL is considering funding the proposed Power Ring Manufacturing Scale-up as one of 30 DOE selected for funding under the Recovery Act.

The objective of the proposed project is for SBE, Inc., in two phases, to construct and qualify a state of the art direct current (DC) bus capacitor facility that is capable of meeting a 100,000 Electric Drive Vehicle capacity level. In Phase I, SBE would use its existing facility in Barre, Vermont, to development new equipment, perform testing, and have an actual production run as part of SBE's existing DC bus capacitor line. Phase I would end with the design of a new building to be located at the Barre facility site (see attached maps). Phase II would begin with completion of a new building design. The facility would be designed and pre-permitted for efficient expandability.

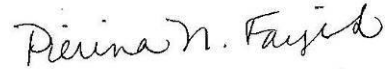
As part of our coordination and consultation responsibilities and to comply with both Section 7 of the Endangered Species Act of 1973, as amended, and provisions of the Fish & Wildlife Coordination Act, we would appreciate receiving any information you have on important wildlife resources, including endangered and threatened species or critical habitat, in the project area.

Based on the scope of the proposed project, DOE plans to prepare an Environmental Assessment (EA), in accordance with requirements of the National Environmental Policy Act, to analyze, document, and disseminate information on the potential environmental consequences of the proposed project. Information that you provide will be incorporated and appropriately addressed in the EA. If your initial review concludes that no endangered or threatened species (or their habitat) are present in the project area and that neither protected species nor their habitat would be affected by the proposed action, a written acknowledgement of that conclusion would be appreciated. In any case, the information that you provide will be considered in preparing a draft EA, which will be provided to you for review upon availability.



Should you require additional information, please contact me by telephone at (412) 386-5428 or by email at [pierina.fayish@netl.doe.gov](mailto:pierina.fayish@netl.doe.gov).

Sincerely,



Pierina Fayish  
NEPA Document Manager

Enclosures



United States Department of the Interior



FISH AND WILDLIFE SERVICE

New England Field Office  
70 Commercial Street, Suite 300  
Concord, NH 03301-5087  
<http://www.fws.gov/newengland>

REF: EA, research facility  
Barre, VT

December 22, 2009

Pierina Fayish  
U.S. Dept. of Energy  
National Energy Technology Laboratory  
P.O. Box 10940  
Pittsburgh, PA 15236-0940

Dear Ms. Fayish:

We received your letter (enclosed) requesting an endangered species review in regard to the proposed project identified above.

The New England Field Office has developed measures to streamline the endangered species consultation process and other requests for technical assistance. The information you have requested is available on our website at:

<http://www.fws.gov/newengland/endangeredspec-consultation.htm>

Please review these streamlining measures. We are confident they will adequately address your request. For assistance in navigating the website, please contact Anthony Tur at 603-223-2541.

Sincerely yours,

Eric L. Derleth  
Acting Supervisor  
New England Field Office

Enclosure



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

New England Field Office  
70 Commercial Street, Suite 300  
Concord, NH 03301-5087  
<http://www.fws.gov/newengland>



January 4, 2010

To Whom It May Concern:

This project was reviewed for the presence of federally-listed or proposed, threatened or endangered species or critical habitat per instructions provided on the U.S. Fish and Wildlife Service's New England Field Office website:

<http://www.fws.gov/newengland/EndangeredSpec-Consultation.htm>

Based on the information currently available, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service (Service) are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

This concludes the review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your cooperation. Please contact Mr. Anthony Tur at 603-223-2541 if we can be of further assistance.

Sincerely yours,

A handwritten signature in blue ink, appearing to read "T. Chapman", written over a horizontal line.

Thomas R. Chapman  
Supervisor  
New England Field Office

## Appendix C SHPO Consultation



**NATIONAL ENERGY TECHNOLOGY LABORATORY**  
Albany, OR • Morgantown, WV • Pittsburgh, PA



November 19, 2009

Ms. Judith Ehrlich  
Director of Operations and Project Review  
Vermont Division for Historic Preservation  
National Life Building, 2nd Floor  
Montpelier, VT 05620-1201

Subject: Proposed Power Ring Manufacturing Scale-up in Barre, Vermont

Dear Ms. Ehrlich:

The Department of Energy's (DOE) National Energy Technology Laboratory (NETL) manages the research and development portfolio of the Vehicle Technologies (VT) Program for the Office of Energy Efficiency and Renewable Energy. A key objective of the VT program is accelerating the development and production of electric drive vehicle systems in order to substantially reduce the United States' consumption of petroleum. Another of its goals is the development of production-ready batteries, power electronics, and electric machines that can be produced in volume economically so as to increase the use of electric drive vehicles.

Congress appropriated significant funding for the VT program in the American Recovery and Reinvestment Act of 2009, Public Law 111-5 (Recovery Act) in order to stimulate the economy and reduce unemployment in addition to furthering the existing objectives of the VT program. NETL is considering funding the proposed Power Ring Manufacturing Scale-up as one of 30 DOE selected for funding under the Recovery Act.

The objective of the proposed project is for SBE, Inc., in two phases, to construct and qualify a state of the art direct current (DC) bus capacitor facility that is capable of meeting a 100,000 Electric Drive Vehicle capacity level. In Phase I, SBE would use its existing facility in Barre, Vermont, to development new equipment, perform testing, and have an actual production run as part of SBE's existing DC bus capacitor line. Phase I would end with the design of a new building to be located at the Barre facility site (see attached maps). Phase II would begin with completion of a new building design. The facility would be designed and pre-permitted for efficient expandability.

As part of our coordination and consultation responsibilities and to comply with the implementing provisions of Section 106 of the National Historic Preservation Act of 1966, we would appreciate receiving any information you have regarding historic or cultural properties in the project area.

Based on the scope of the proposed project, DOE plans to prepare an Environmental Assessment (EA), in accordance with requirements of the National Environmental Policy Act, to analyze, document, and disseminate information on the potential environmental consequences of the proposed project. Information that you provide will be incorporated and appropriately addressed in the EA. If your initial review concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed action, a written acknowledgement of that conclusion would be appreciated. In any case, the information that you provide will be considered in preparing a draft EA, which will be provided to you for review upon availability.

Should you require additional information, please contact me by telephone at (412) 386-5428 or by email at [pierina.fayish@netl.doe.gov](mailto:pierina.fayish@netl.doe.gov).

Sincerely,



Pierina Fayish  
NEPA Document Manager

Enclosures



**State of Vermont**  
**Division for Historic Preservation**  
One National Life Drive, Floor 2  
Montpelier, VT 05620-1201  
[www.HistoricVermont.org](http://www.HistoricVermont.org)

[phone] 802-828-3211  
[Division fax] 802-828-3206

*Agency of Commerce and  
Community Development*

December 7, 2009

Pierina Fayish M/S 922-M217  
National Energy Technology Laboratory  
PO Box 10940  
Pittsburgh PA 15236

**Re: Proposed New Manufacturing Facility for SB Electronics, Wilson Industrial Park, Websterville, Vermont. Departments of Energy, Housing and Urban Development Section 106 Review.**

Dear Pierina:

Thank you for the opportunity to comment on the above-referenced project. The following comments will assist the U.S. Department of Energy (DOE), the U.S. Department of Housing and Urban Development (HUD), and any other federal agency in their review responsibilities under Section 106 of the National Historic Preservation Act.

The Division for Historic Preservation (Division) is providing the DOE and HUD with the following comments pursuant to 36 CFR 800.4, regulations established by the Advisory Council on Historic Preservation to implement Section 106 of the National Historic Preservation Act. Project review consists of identifying the project's potential impacts to historic buildings, structures, historic districts, historic landscapes and settings, and known or potential archeological resources.

The proposed project consists of the construction of a new manufacturing facility for SB Electronics within the existing Wilson Industrial Park in Websterville, Barre Town, Vermont. No historic sites or archeologically sensitive areas were identified during a desk review of the project area. Accordingly, the Division concludes that a finding of **No Historic Properties Affected** is warranted for this undertaking.

Thank you for your cooperation in protecting Vermont's irreplaceable historic and archeological heritage. R. Scott Dillon reviewed this project and prepared this letter. I concur with the findings and conclusions described above.

Sincerely:

VERMONT DIVISION FOR HISTORIC PRESERVATION

A handwritten signature in black ink that reads "Nancy E. Boone".

Nancy E. Boone

Acting State Historic Preservation Officer

Cc: Josh Hanford, ACCD

Laurie Emery, Central Vermont Regional Planning Commission



## Appendix D Contact with the Bureau of Indian Affairs and Tribal Councils



**NATIONAL ENERGY TECHNOLOGY LABORATORY**  
Albany, OR • Morgantown, WV • Pittsburgh, PA



November 18, 2009

Bureau of Indian Affairs, Eastern Regional Office  
545 Marriott Drive, Suite 700  
Nashville, TN 37214

Subject: Proposed Power Ring Manufacturing Scale-up in Barre, Vermont

Dear Sir or Madam:

The Department of Energy's (DOE) National Energy Technology Laboratory (NETL) manages the research and development portfolio of the Vehicle Technologies (VT) Program for the Office of Energy Efficiency and Renewable Energy. A key objective of the VT program is accelerating the development and production of electric drive vehicle systems in order to substantially reduce the United States' consumption of petroleum. Another of its goals is the development of production-ready batteries, power electronics, and electric machines that can be produced in volume economically so as to increase the use of electric drive vehicles.

Congress appropriated significant funding for the VT program in the American Recovery and Reinvestment Act of 2009, Public Law 111-5 (Recovery Act) in order to stimulate the economy and reduce unemployment in addition to furthering the existing objectives of the VT program. NETL is considering funding the proposed Power Ring Manufacturing Scale-up as one of 30 DOE selected for funding under the Recovery Act.

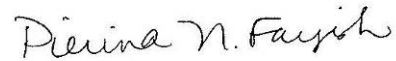
The objective of the proposed project is for SBE, Inc., in two phases, to construct and qualify a state of the art direct current (DC) bus capacitor facility that is capable of meeting a 100,000 Electric Drive Vehicle capacity level. In Phase I, SBE would use its existing facility in Barre, Vermont, to development new equipment, perform testing, and have an actual production run as part of SBE's existing DC bus capacitor line. Phase I would end with the design of a new building to be located at the Barre facility site (see attached maps). Phase II would begin with completion of a new building design. The facility would be designed and pre-permitted for efficient expandability.

As part of our coordination and consultation responsibilities and to comply with the implementing provisions of The American Indian Religious Freedom Act, 42 United States Code § 1996, we would appreciate receiving any information you have regarding Native American sacred locations, traditional resources, or traditional religious practices potentially affected by the proposed project.

Based on the scope of the proposed project, DOE plans to prepare an Environmental Assessment (EA), in accordance with requirements of the National Environmental Policy Act, to analyze, document, and disseminate information on the potential environmental consequences of the proposed project. Information that you provide will be incorporated and appropriately addressed in the EA. If your initial review concludes that no Native American sacred locations, traditional resources, or traditional religious practices would potentially be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated. In any case, the information that you provide will be considered in preparing a draft EA, which will be provided to you for review upon availability.

Should you require additional information, please contact me by telephone at (412) 386-5428 or by email at [pierina.fayish@netl.doe.gov](mailto:pierina.fayish@netl.doe.gov).

Sincerely,



Pierina Fayish  
NEPA Document Manager

Enclosures