STRATEGIC ENVIRONMENTAL REPORT FRAMEWORK

BLUE ENERGY GLOBAL, INC.

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Executive Summary

This white paper presents a comprehensive strategy for preparing an Environmental Report (ER) to support a Nuclear Regulatory Commission (NRC) Construction Permit (CP) application for a Small Modular Reactor (SMR) project in Victoria County, Texas. The proposed site, located near Bloomington, Texas and near to a barge canal, is currently used for agricultural purposes. Blue Energy is seeking feedback from NRC regarding the strategy and approach to the ER described in this white paper.

The ER will be developed in accordance with 10 CFR Part 51, NUREG-1555, COL/ESP-ISG-027 Interim Staff Guidance on Specific Environmental Guidance for Light Water Small Modular Reactors, and Regulatory Guide (RG) 4.2 revision 3, [[redacted]]abc

[[redacted]]abc The SMR's limited footprint, passive safety features, and minimal anticipated environmental impacts—combined with the absence of sensitive habitats, historic resources, or complex urban interfaces—indicates that a Finding of No Significant Impact (FONSI) is achievable. [[redacted]]

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This strategy positions the Port of Victoria SMR project for a timely, defensible, and policy-aligned environmental review, supporting its role in advancing clean energy and national resilience.

1.0 Introduction and Purpose

The United States is undergoing a transformative shift in its energy infrastructure, driven by rapidly increasing electricity demand for the first time in more than a decade and the dual imperatives of decarbonization and energy security. SMRs offer a promising solution to meet these goals, providing scalable, no-emission baseload power with enhanced safety features. The proposed SMR project in Victoria County, Texas, is a strategic initiative aligned with national energy policy and regional development objectives.

The ER is a foundational document required by the NRC to evaluate the environmental impacts of proposed nuclear facilities. It serves as the applicant's formal submission under the NEPA, providing the basis for the NRC's environmental document(s). This white paper outlines a strategy for preparing the ER in accordance with NRC regulations and guidance, while integrating recent federal reforms that streamline the NEPA process. With this white paper, Blue Energy is seeking feedback and guidance from NRC regarding this proposed approach for the ER.

2.0 Regulatory Framework

2.1 NRC Requirements

The NRC's environmental review process is governed by 10 CFR Part 51, which implements NEPA for nuclear licensing actions. Section 51.45 requires applicants to submit a signed ER as a separate document. The ER's content required at this stage, includes:

- A description of the proposed action
- A discussion of alternatives
- A description of the affected environment
- An analysis of environmental impacts
- A discussion of mitigation measures
- Consideration of fuel cycle and transportation impacts under §§ 51.51 and 51.52
- Monitoring and reporting procedures

The ER must be submitted with the CP application and must be sufficiently detailed to support the NRC's independent review.

Additional guidance and details on NRC's consideration of environmental impacts are contained in NUREG-1555 "Standard Review Plans for Environmental Reviews for Nuclear Power Plants," and COL/ESP-ISG-027 Final Interim Staff Guidance on "Specific Environmental Guidance for Light Water Small Modular Reactors Reviews."

2.2 Regulatory Guide 4.2, Revision 3

RG 4.2, Revision 3 provides detailed guidance on the preparation of ERs for nuclear power stations. It recommends a structured format that includes:

- Executive Summary
- Description of the Proposed Action
- Alternatives
- Affected Environment
- Environmental Consequences
- Mitigation Measures
- Consultations and Compliance
- Appendices and References

The guide emphasizes the importance of clarity, completeness, and the use of visual aids such as maps, figures, and tables to support the analysis.

2.3 Recent Federal Reforms

Several recent developments have reshaped the NEPA landscape:

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These reforms collectively support a more focused, efficient, and legally defensible environmental review process.

3.0 Project Description and Purpose

The proposed SMR facility will be located on a parcel of land in Victoria County, Texas, currently used for agricultural purposes. However, prior to the start of construction of the SMR, a combined cycle natural gas power plant will be constructed on the site and will be fully operational. The project will involve the construction and operation of one or more modular reactor units, along with associated infrastructure including:

- Reactor buildings and containment structures
- Access roads, parking, and security fencing
- Support facilities

Each SMR reactor building and containment structure will be located on [redacted]

[[redacted]]abc

The SMR will contribute to Texas's energy diversification, support national decarbonization goals, and enhance energy security. The project is also aligned [[redacted]]abc

4.0 Site Characterization

The proposed Port of Victoria SMR project will be constructed on a site that will have an operating combined cycle gas plant at the time the SMR construction is initiated. A thorough environmental characterization of the site is essential to understand baseline conditions and to evaluate potential environmental impacts.

4.1 Land Use

The site is in a semi-rural area and is currently used for agricultural purposes. The site consists of [[redacted]]c west of Bloomington, Texas (population 1409). Prior to the start of construction of the SMR, the site will have been converted to industrial use with the development of the combined cycle gas power plant. This conversion of farmland to industrial use is part of a broader trend in the area.

4.2 Physical Environment

Geological surveys will assess soil stability, erosion potential, and seismic risk. The site lies within a region of relatively stable geology, but localized subsidence and floodplain dynamics must be considered. Hydrologically, while not anticipated, the nearby canal provides a potential source of cooling water, but its flow characteristics, seasonal variability, and ecological sensitivity require detailed analysis. Groundwater resources will be evaluated for potential contamination risks and long-term sustainability.

4.3 Biological Environment

The terrestrial environment includes riparian zones, and agricultural fields that may serve as habitats for insects, migratory birds, reptiles, and mammals. The aquatic environment of the Black Bayou and the barge canal may support fish, macroinvertebrates, and aquatic vegetation. RG 4.11 may be used to support the planning of terrestrial surveys should they be deemed necessary. However, at a minimum, a preliminary site investigation and terrestrial survey will be prepared, and some surveys may be done as a precautionary measure and to support environmental due diligence. RG 4.24 will guide the design and implementation of aquatic surveys should they be necessary, including seasonal sampling and species inventories. However, RG 4.24 primarily directs surveys of waterways that will be impacted by intakes for or discharges from a nuclear power plant. The nature and extent of future terrestrial or aquatic surveys will be done in coordination with the U.S. Fish and Wildlife Service (USFWS), the Texas

Parks and Wildlife Department (TPWD) The presence of threatened or endangered species will be assessed in consultation with the USFWS.

4.4 Meteorology and Climate

Victoria County experiences a humid subtropical climate with hot summers, mild winters, and periodic extreme weather events such as hurricanes and flooding. Regional meteorological data will be used to model dispersion of airborne emissions, assess cooling system efficiency, and evaluate climate resilience. Long-term climate projections will inform adaptive design features and emergency preparedness.

4.5 Cultural and Historic Resources

The proposed site is currently disturbed ground used for agricultural purposes and, according to the Phase I Environmental Site Assessment, has been used for such purposes for at least the past 80 years. Nonetheless cultural resource surveys will be conducted to identify any archaeological sites, historic structures, or tribal interests within the project area. Consultation with tribal governments and the Texas Historical Commission will ensure compliance with the National Historic Preservation Act. Any identified resources will be documented and, if necessary, preserved or mitigated through design modifications.

5.0 Environmental Impact Analysis

The environmental impact analysis will evaluate the potential effects of the proposed SMR project across multiple domains, using both qualitative and quantitative methods. [[redacted]]bc

For NEPA reviews agencies are required to avoid *segmenting* projects and considering only one piece of a project at a time. [[redacted]]abc

5.1 Construction Impacts

Although the SMR is an advanced reactor, designed to largely be fabricated offsite in a modular fashion and then assembled on site, construction activities on site are typical of industrial development. The construction will involve land grading, excavation, and infrastructure development; however, most of the site will already be developed with the construction of a combined cycle gas plant prior to the start of the SMR construction. The SMR construction activities may result in:

- Soil erosion and sedimentation
- Airborne dust and particulate emissions
- Increased traffic and noise
- Temporary impacts on local water quality (i.e. Black Bayou, and the barge canal)

Likely mitigation measures will include erosion control plans, dust suppression techniques, traffic management strategies, and coordination with local stakeholders. Again, these mitigation measures are typical for industrial construction activities.

The major components of the SMR will be transported to site via barge. Blue Energy is currently evaluating an existing pier near to the site to determine if it can handle the weight of the SMR components. If the pier needs to be upgraded, then some construction activities would occur in the canal and mitigation measures suitable for an aquatic environment would need to be implemented. Except for that potential pier modification, all construction activities will occur on dryland. There will be no water intake or discharge to the environment.

5.2 Operational Impacts

Operational impacts will be assessed over the expected life of the facility, including:

- **Radiological Emissions**: Routine and accidental releases will be modeled using NRC-approved software. Emergency planning zones will be delineated, and public safety measures will be described.
- **Air Emissions**: Cooling tower emissions of particulate matter and the potential for fogging will be evaluated

5.3 Cumulative Impacts

In discussions about NEPA reform, analyses of “cumulative” and “indirect” impacts have been targeted as areas that cause delays in reviews. NEPA itself does not explicitly require evaluation of either cumulative or indirect impacts. It only requires review of “reasonably foreseeable” impacts.

The explicit requirement to consider cumulative impacts came first from the now-repealed CEQ regulations. Those regulations defined a cumulative impact as one that: “results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions.”[1]

Although the CEQ regulations have been repealed, NRC has only recently begun its process to revise its own NEPA regulations. NRC has also long taken the position that as an independent agency it was not directly bound by the CEQ regulations. The existing NRC regulations and

[1] https://ceq.doe.gov/docs/ceq-publications/ccenepa/sec1.pdf

guidance continue to require an assessment of cumulative impacts (including, for example, in 10 CFR 51.45(c) and 51.47(d), as well as Regulatory Guide 4.2, Chapter 7).

[redacted]]abc

5.4 Socio-economic Impacts

Several recent changes have eliminated the requirement to include explicit environmental justice analyses in NEPA reviews (or other agency processes). Executive Order 14173 revoked a 1990s era EO that had outlined the criteria for agencies to consider in analyzing environmental justice issues. In response, the NRC revoked its own environmental justice guidance in May of 2025 and has directed staff not to include environmental justice analyses in their reviews.

[redacted]]]abc

6.0 Alternatives Analysis

The ER will present a robust analysis of alternatives to the proposed action. Typically, alternatives analyses included:

- **No-Action Alternative**: Maintaining the site as a combined cycle gas plant, with no reduction in emissions due to the proposed SMR development
- **Alternative Sites**: Evaluating other locations within the region that may offer similar benefits with fewer environmental impacts
- **Alternative Technologies**: Considering renewable energy options, such as solar or wind, and larger-scale nuclear reactors
- **Comparative Impacts**: Assessing each alternative for its environmental footprint, economic feasibility, and alignment with strategic objectives.

In response to various legal developments, NRC in its direction to staff on revising the NEPA regulations emphasized that the new regulations should: “limit the alternative[s] analysis to avoid analysis of forms of generation outside the NRC’s regulatory and licensing authority,

including a focus on the no action alternative." Therefore, developing alternatives for non-NRC-approved technologies is no longer required. The NRC staff guidance has noted that the future regulations will focus alternatives on the Proposed Project and the No Action alternative.

As part of the No Action alternative, however, the ER should still include an analysis of the reasonably foreseeable impacts of alternative generation sources that would be required to meet the load that the Blue Energy SMR will serve. Doing so is necessary to provide the necessary information to the NRC to make its statutory required judgments.

The preferred alternative will be justified based on its ability to meet project goals while minimizing adverse environmental effects.

7.0 Mitigation and Monitoring

Mitigation measures will be integrated into project design and operations to reduce environmental impacts. These typically include:

- **Construction Mitigation**: Erosion control, dust suppression, noise abatement, and traffic management. Implementation of best management practices
- **Operational Mitigation**: Radiological monitoring systems, and habitat restoration programs
- **Emergency Response**: Coordination with local emergency services, development of evacuation plans, and public education initiatives

Monitoring programs will be established to track environmental performance and ensure compliance with permit conditions.

8.0 Consultation and Public Engagement

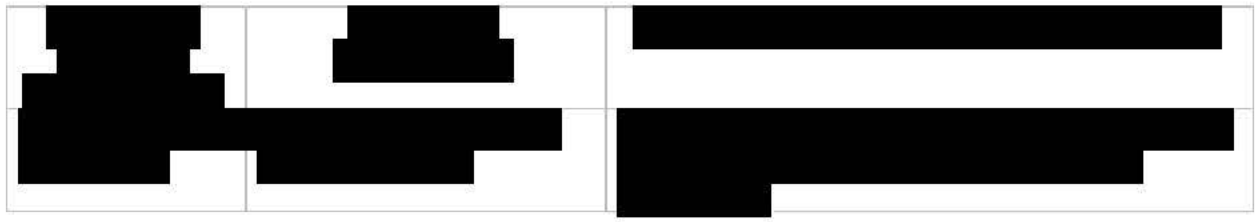
Stakeholder engagement is a cornerstone of the NEPA process and is crucial to successful infrastructure development even in the absence of NEPA reviews. Even if Blue Energy elects to structure an ER around the expectation that NRC will be able to satisfy NEPA by preparing an EA rather than an EIS, it will still prepare and engage in a robust public engagement strategy.

In its directive to Staff on revising NEPA regulations, the Commission emphasized the need to preserve transparency and robust public engagement.

The ER will document consultations with:

- **Federal Agencies**: NRC, EPA, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and the CEQ
- **State Agencies**: Texas Commission on Environmental Quality, Texas Parks and Wildlife Department, Texas Department of Agriculture
- **Local Governments**: Victoria County, City of Bloomington
- **Tribal Entities**: Consultation with tribes with ancestral ties to the region
- **Public Stakeholders**: Scoping meetings, public comment periods, and outreach campaigns

Engagement will be inclusive, transparent, and responsive to community concerns.



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11.1 Limited Scope and Scale of the Project

- **SMR Design**: The proposed facility uses modular reactor technology with a smaller footprint, lower thermal output, and passive safety features compared to traditional large reactors.
- **Land Use**: Prior to development of the SMR project, the land will be used to support a combined cycle natural gas power plant. The site has no known sensitive habitats, historic landmarks, or complex urban interfaces.

- **Infrastructure**: The site is accessible by a canal and a planned rail line, and the combined cycle natural gas power plant's power distribution system will be in place reducing the need for infrastructure development.

[[ ]]abc The NRC has recognized in its Staff Guidance for light water SMRs that the lack of water-cooling intakes for SMRs eliminates the need for some more detailed (and longer duration) aquatic resource studies.

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- [[ ]]abc
- **Radiological Profile**: SMRs have lower emissions and accident risk profiles, and generic analyses under 10 CFR §§ 51.51 and 51.52 may suffice.

The absence of significant, long-term, or irreversible impacts supports a Finding of No Significant Impact (FONSI).

[[

[redacted]

12.4 Recommendations

To maximize regulatory alignment and review efficiency, the following recommendations are proposed:

1. [[redacted]]abc

By following this strategy, the Blue Energy Port of Victoria SMR project is well-positioned for a timely, legally sound, and policy-aligned environmental review. The ER will serve not only as a regulatory document but as a strategic tool for advancing clean energy deployment in a rapidly evolving national landscape.

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[a] Withheld pursuant to 10 CFR 2.390(a)(4) as information which discloses process, method, or apparatus, including supporting data and analyses, where prevention of its use by Blue Energy competitors without license or contract from Blue Energy constitutes a competitive economic advantage over other companies in the industry.

[b] Withheld pursuant to 10 CFR 2.390(a)(4) as information, which if used by a competitor, would reduce his or her expenditure of resources or improve his or her competitive position in design, manufacture, shipment, installation, assurance of quality.

[c] Withheld pursuant to 10 CFR 2.390(a)(4) as information which reveals aspects of past, present, or future Blue Energy or customer funded development plans or programs, of potential commercial value to Blue Energy.