FutureGen Industrial Alliance, Inc.

FINAL

Request for Proposals for FutureGen Facility Host Site

1. Introduction and Background

The FutureGen Industrial Alliance, Inc. (Alliance) invites proposals for sites upon which the Alliance will build and operate the world's first coal-based, near-zero emission power plant. The FutureGen power plant will produce electricity and hydrogen-rich (H_2) synthetic gas from coal while capturing and permanently storing carbon dioxide (CO_2) in a deep geologic formation. Proposals submitted must comply with the instructions and procedures described in this Request for Proposal (RFP). The Alliance reserves the right to exclude from evaluation any proposals that do not comply with the instructions and procedures described in this RFP.

Proposals submitted in response to this RFP must be received by the Alliance no later than 4:00 p.m. Eastern Time on May 4, 2006. If multiple sites are being proposed by a single offeror, each site offered must be submitted as a separate proposal. Clarifying questions on the RFP may be submitted by sending an electronic mail message to SiteRFP@FutureGenAlliance.org no later than 5:00 p.m. Eastern Time on March 16, 2006. The subject line for the electronic mail message should read "RFP Clarifying Question." In addition, offerors must submit a notice of intent to submit a proposal, and the number of sites that will be proposed, no later than 5:00 p.m. Eastern Time on March 24, 2006, by sending an electronic mail message to SiteRFP@FutureGenAlliance.org. The subject line for the electronic mail message should read "Notice of Intent to Submit a Proposal." The names of offerors submitting notices will not be publicly released. A notice may be rescinded at any time, but proposals submitted without prior notice will not be accepted.

1.1. Project Overview

FutureGen is a government-industry cost-shared project to design, build, and operate the world's first coal-based, near-zero emission power plant. The plant will also produce H_2 and byproducts for use by other industries.

On December 2, 2005, the U.S. Department of Energy (DOE) entered into a co-operative agreement with the FutureGen Industrial Alliance, Inc. to begin the site selection process and prepare a conceptual design for the facility.

Alliance member companies are among the largest coal producers and energy generators in the world. The operations of member companies span six continents: North America, Africa, Asia, Australia, Europe, and South America. Alliance members intend to contribute up to $250 million toward the project's costs and, in addition, will bring valuable technical and industrial project management expertise to the project. Further, the Alliance will facilitate the introduction of advanced technologies into the plant that are based upon millions of dollars of past industrial investment. The active role of industry in this project ensures that the public and private sector share the cost and risk of developing the advanced technologies necessary to commercialize the FutureGen concept.

The Alliance is incorporated as a 501(c)(3) (not-for-profit) corporation under rules of the U.S. Internal Revenue Service. As a result, none of the members of the Alliance will realize any direct financial benefit from their contributions to the Alliance. As a not-for-profit entity, the Alliance will own the power plant and sell the electricity, H_2, and other useful byproducts to the marketplace.

FutureGen is unique in a number of respects. Researchers and industry have made great progress advancing technologies to support coal gasification, electricity generation, emissions control, CO_2 capture and permanent geologic storage, and H_2 production. While these technologies exist today in various states of development, they have yet to be integrated and tested at a single plant, which is essential for such plants to be technically and commercially viable. DOE expects that the technologies developed and proven through FutureGen will ultimately lead to plants that produce electricity with less than a 10 percent increase in cost compared to plants that do not use CO_2 capture technology.

The FutureGen plant will be designed to produce electricity that is equivalent to the amount used by 150,000 average U.S. homes. The plant will gasify the coal through a process that will convert the coal’s carbon to synthesis gas consisting of mostly H_2 and carbon monoxide (CO). The synthesis gas will react with steam to produce additional H_2 and a concentrated stream of CO_2. This effort will lay the groundwork for developing similar power plants throughout the world.

The H_2 can be used as a clean fuel in applications such as electricity generation in turbines, fuel cells, or hybrid combinations of these technologies. The captured CO_2 will be separated from the H_2 and permanently stored in deep saline formations, unmineable coal seams, depleted oil and gas formations, and/or other safe geologic formations.

Ninety percent of the total CO_2 produced by the plant is expected to be captured initially. With advanced technologies, this type of plant may eventually be able to capture up to 100 percent of CO_2 emissions.

This RFP seeks proposals for suitable sites upon which to build the FutureGen facility. It describes the site requirements including site access, ownership, CO_2 storage potential, and other related issues. Based on the responses to this RFP and using the selection process described below, the Alliance will identify candidate sites for the FutureGen facility. After the conclusion of the DOE's National Environmental Policy Act (NEPA) compliance process, the Alliance expects to select a preferred host site. For the host site, the Alliance will determine the final design for the power plant and the specifications for safe and permanent CO_2 storage based on the specific characteristics of the selected site. Information requirements in this RFP are commensurate with a facility of the magnitude and type represented by FutureGen.

The Alliance and the successful offeror will enter into contractual negotiations for the Alliance's right to use the site. Appendix A contains a list of terms and conditions that the Alliance proposes for the resulting contract. By submitting a response to the RFP, the offeror agrees to accept the terms and conditions, unless requests for additions or exceptions are made in the proposal. Requests for additions or exceptions to the terms and conditions must be submitted with the offeror's proposal and must be accompanied by an explanation of why the exception is being sought and what specific effect it would have on the offeror's ability to transfer the property or its use to the Alliance. While individual exceptions taken to the terms and conditions will not disqualify an offeror, the extent and nature of exceptions could result in a proposal being viewed as non-responsive.

1.2. Timeline for Solicitation

Proposals submitted in response to this RFP must be received by the Alliance no later than 4:00 p.m. Eastern Time on May 4, 2006. Proposals received after this deadline will not be evaluated. General proposal requirements, including the address to which proposals must be sent, are contained in Section 1.5.

1.3. Site Selection Process

Once the proposals are received, a site evaluation and selection process will begin. It involves four stages, as shown in Figure 1-1 and described below.

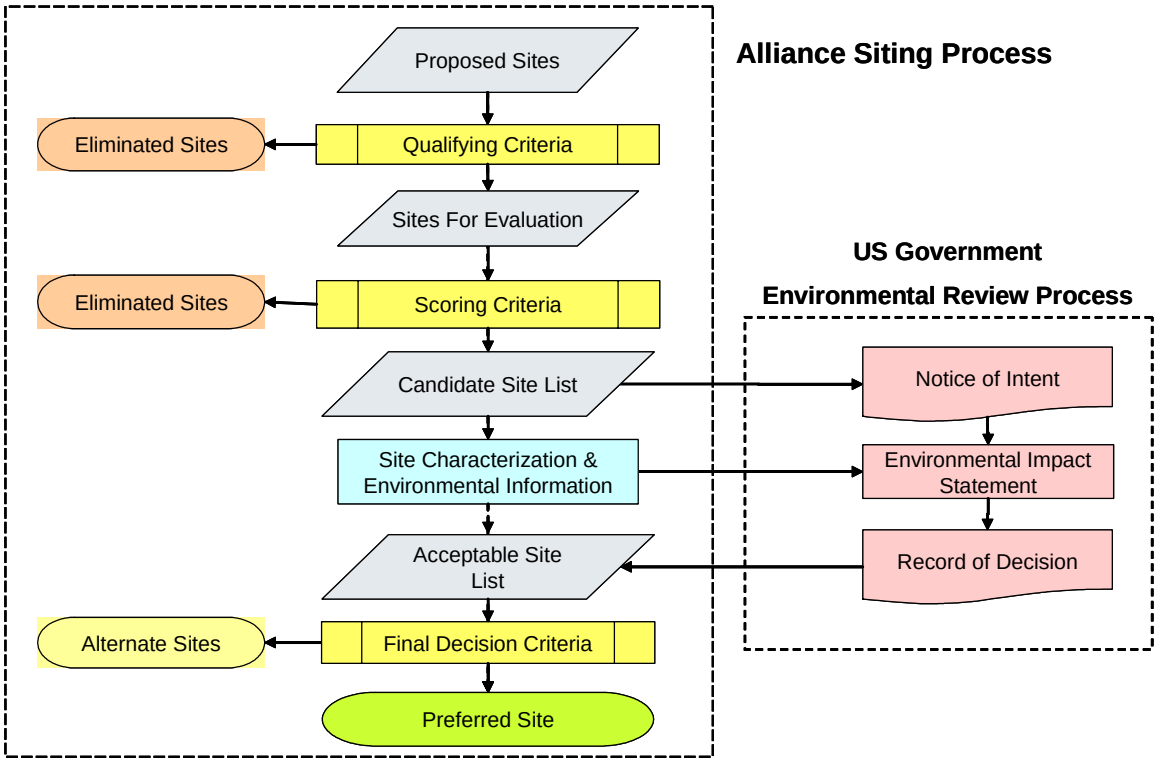

Figure 1-1. Overview of the Site Evaluation and Selection Process

- All proposals will be evaluated against the qualifying criteria described in this RFP (Section 3, Parts 1 and 2). These criteria are mandatory requirements, and any proposals that do not meet all of the qualifying criteria will be excluded from further consideration. Potential offerors are urged to ensure that their proposed sites meet each qualifying criterion before submitting a proposal.

- The proposed sites that meet the qualifying criteria will be evaluated using the scoring criteria described in this RFP (Section 3, Parts 3 and 4). The Alliance will also conduct a best value assessment (Section 3, Part 5). Based on its evaluation of the proposals, the Alliance will develop a Candidate Site List, consisting of those sites that are best qualified to host the FutureGen facility. The Alliance will announce the Candidate Site List in summer 2006.

- Giving consideration to the Candidate Site List, DOE will determine the reasonable site alternatives to be addressed in the environmental impact statement (EIS). To develop the EIS, the reasonable site alternatives will be evaluated by DOE for potential environmental impacts as required under NEPA. To support DOE's NEPA process, the site offeror will be required to assist the Alliance and DOE with further characterization of their candidate site, including providing documentation for an

environmental information volume (EIV) that will be provided by the Alliance to DOE. Each offeror whose site is included in the Candidate Site List will be expected to contribute data and information and to cover all their costs associated with assisting the Alliance in the preparation of the EIV. Based on findings during the NEPA process and the EIS prepared in accordance with the NEPA process, DOE may provide the Alliance with a list of acceptable sites in a Record of Decision. A Record of Decision is expected approximately one year after the announcement of the Candidate Site List.

- Following the DOE Record of Decision, the Alliance expects to select a final site among the sites found acceptable by DOE in the Record of Decision. The Alliance reserves the right, at its sole discretion, to request a Best and Final Offer from offerors with sites on the Acceptable Site List provided by DOE after completion of the NEPA process. The Alliance intends to announce the final, preferred site for the FutureGen facility in September 2007.

1.4. Points of Contact

To ensure fairness in the site selection process, from the date this RFP is issued until the Alliance announces the Candidate Site List, potential offerors and their representatives are prohibited from discussing this procurement with any Alliance member companies or staff, unless authorized in writing by the Alliance Chief Executive Officer (see Section 1.5.2). Any unauthorized contact may disqualify the offeror from further consideration. Clarifying questions on the RFP may be submitted in writing to SiteRFP@FutureGenAlliance.org no later than 5:00 p.m. Eastern Time on March 16, 2006. The subject line for the electronic mail message should read “RFP Clarifying Question.” Should any issues arise with electronic submittal due to a malfunction of the FutureGen Alliance website, the website technician may be contacted at 202-429-8430. The website technician will not be able to answer questions on the RFP itself.

1.5. General Requirements and Conditions

1.5.1. Non-Responsive or Incomplete Proposals

Offerors should familiarize themselves with the entire solicitation and must furnish all the information sought. Proposals must be organized along the outline specified in this RFP and adhere to the page limits specified herein. The Alliance reserves the right to refuse to evaluate, deem non-responsive, and/or disqualify from further consideration those proposals that are missing any requested information, are difficult to read or understand, or do not follow the format for responding to the RFP. Elaborate brochures or other presentations beyond those sufficient to present a complete and effective response to this RFP are not desired. Material deemed extraneous will not be considered in the proposal evaluation.

1.5.2. Conflict of Interest

In preparing and submitting their proposals, offerors or their representatives may not consult with any individual or organization that is currently involved in the activities of the FutureGen Alliance on any matter relating to the proposed FutureGen facility, including

- The member companies of the FutureGen Industrial Alliance (American Electric Power, Anglo American, BHP-Billiton, China Huaneng Group, CONSOL Energy, Foundation Coal Corporation, Kennecott Energy/Rio Tinto, Peabody Energy, Southern Company) or their affiliated entities;
- Battelle Memorial Institute or any Battelle-affiliated company or National Laboratory managed or co-managed by Battelle;
- Atlantic Partners LLC;
- The law firm of Van Ness Feldman;
- DOE and DOE's National Energy Technology Laboratory (NETL);
- NETL's site support contractors subject to organizational conflict of interest restrictions;
- Any individual or organization that has reviewed or had other access to this RFP prior to its release; and
- Members of the Alliance Technical Experts Group (TEG) or their organizations. TEG members and their organizations are listed on the Alliance's website at www.FutureGenAlliance.org/Alliance/other.stm.

1.5.3. Proposal Reviewers

In order to evaluate the proposals, the Alliance may obtain assistance and technical expertise from qualified reviewers who are not Alliance employees or employees of the Alliance member companies. By submitting proposals, the offerors agree to such reviews by non-Alliance personnel. The Alliance will obtain assurances in advance from all reviewers that proposal information will be kept confidential and will be used only for evaluation purposes. Further, after the Alliance concludes its review of the proposals, the Alliance will make all the proposals received available to the DOE, along with a report covering the Alliance's findings and the Alliance's proposed Candidate Site List. DOE may review all of these documents before initiating the NEPA process. By submitting proposals, the offerors agree to such reviews by DOE personnel and non-conflicted DOE contractor personnel.

1.5.4. Amendment to the RFP

This RFP can be modified only by express, formal amendment of the RFP and publication by the Alliance. No other communication, whether oral or in writing, will modify the terms of this RFP. Any amendments to the RFP will be posted on the Alliance website (www.FutureGenAlliance.org). Offerors are responsible for regularly checking the website for any such amendments throughout the proposal response period.

1.5.5. Additional Information

The Alliance expects to develop the Candidate Site List based entirely on proposals submitted in response to the final RFP. For that reason, offerors are advised to submit their most complete and responsive proposals. However, the Alliance reserves the right to request clarifications and/or supplemental information from some or all offerors through written submissions and/or oral presentations. The Alliance also reserves the right, at its sole discretion, to request a Best and Final Offer from offerors with sites on the Acceptable Site List provided by DOE after completion of the NEPA process.

1.5.6. Site Visits

The Alliance reserves the right to visit one or more of the offered sites prior to the completion of the Candidate Site List.

1.5.7. Supplemental Information

As noted above, the site offeror will be required to assist the Alliance with further characterization of their candidate site and document this characterization in an EIV that will be provided to DOE in order to support DOE's NEPA process. Each offeror whose site is included in the Candidate Site List will be expected to contribute data and information and to cover all their costs associated with assisting the Alliance in the preparation of the EIV. Offerors should expect to spend between $100,000 and $200,000 to prepare the EIV for a site; however, the actual cost will depend on the level of information required by DOE to fulfill its NEPA obligations and the quality and quantity of information that is readily available, among other factors (see www.netl.doe.gov/business/solicitations/2001pdf/41428/EIV_GUIDE.pdf for information on the content of DOE EIVs). Requests for additional information will be made when the Candidate Sites List is announced or shortly thereafter. It is anticipated that the supplemental information would be due 30 to 120 days after the request is made. The amount of information requested will be commensurate with that required for DOE to conduct the NEPA process and the Alliance to begin site characterization. Offerors must cooperate with the Alliance, DOE, and its NEPA contractor(s) in information collection and analysis (at their own expense) in order to remain on the Candidate Site List.

1.5.8. Multiple Proposals

Offerors may, at their option, submit multiple proposals for different sites. In such cases, the Alliance will evaluate each proposal independently. A separate, free-standing, complete proposal must be submitted for each offered site.

1.5.9. Cost of Preparing Proposals

Responses to the information requested in this RFP are expected to be based on existing information to the maximum extent possible. Geologic sampling of proposed sites and other time-consuming or expensive activities are neither encouraged nor required. This RFP is based on the premise that a well-organized and operating proposal team, with an appropriate mix of expertise, and an appropriate site can respond in the timeframe provided for response. Any costs incurred by offerors with respect to this RFP, and for subsequent requests for information, are not reimbursable by the Alliance under any circumstances.

1.5.10. Proposal Submission, Modifications, and Withdrawal

One original and one unbound hard copy of the proposal (and any subsequent modifications thereof) must be submitted. Offerors must also submit 15 compact discs (CD) containing an electronic version of the complete proposal, including appendices, attachments, support documents, and supporting information. The material on the CD must be provided in a logical order and in a PDF format to the fullest extent possible. The two hard copies and 15 CDs must be placed in sealed envelopes or packages addressed to the following address:

FutureGen Industrial Alliance, Inc.
International Square
1875 I Street, N.W.
5th floor
Washington, D.C. 20006
Attn: Site Selection Team

The Alliance will confirm receipt of the proposal, within 48 hours, if an email address is provided by the offeror in the cover letter transmitting their proposal.

Proposals submitted by electronic mail will not be considered. Proposals may be modified in writing, if the modification is received by the deadline for receipt of proposals. Proposals may be withdrawn by written notice received by the Alliance, at the address above, at any time before the final site selection.

1.5.11. Disclosure of Offerors

Offerors are advised that the Alliance may release to the public immediately after the RFP due date a list of the offerors and the sites proposed in response to this RFP.

1.5.12. Release of Proposals

The Alliance reserves the right to release all or parts of the proposals received, or summaries of the proposals, except for any portion of a proposal identified by the offeror as proprietary. The Alliance, in consultation with federal and/or state agencies as applicable, will decline to release information regarding electric or natural gas transmission or other systems that is deemed to pose security concerns. Proposals will not be returned.

2. Project Information

This section provides additional information about the scope of the FutureGen program, the overall goals for both the facility and the program, and implications for the facility.

2.1. Project Scope

As mentioned previously, the objective of the FutureGen is to design, build, and operate the world's first coal-fueled, near-zero emission power plant. The FutureGen power plant will produce electricity and H_2 from coal while capturing and permanently storing CO_2 in a deep geologic formation. The nominal 275-megawatt (MW) prototype plant will operate as a production plant, generating commercially significant electric power. It will also provide a large-scale engineering laboratory for testing new clean power, CO_2 capture, and coal-to-hydrogen technologies, and the facility will include a test bed for testing and developing new technologies. The FutureGen program intends to build and operate the cleanest coal-fueled power plant in the world.

Many aspects of the FutureGen plant will employ cutting-edge technology. Rather than using traditional coal combustion technology, the plant will be based on the coal gasification process in which the coal's carbon is converted to a "synthesis gas" made up primarily of H_2 and CO. Advanced technology will be used to react the synthesis gas with steam to produce additional H_2 and separate out a concentrated stream primarily of CO_2 from the synthesis gas. The H_2 will be used as a clean fuel for electric power generation in turbines, or fuel cells, or hybrid combinations of these technologies, or for other commercial uses.

The separated CO_2 stream will be permanently stored in one or more subsurface geologic formations. This process is commonly referred to as geologic sequestration or geologic storage. Candidate geologic formation(s) will include deep saline formations (which are the most widely prevalent type of reservoir both in the United States and worldwide) and could also include depleted oil and gas reservoirs, unmineable coal seams, and other geologic formations. The target formation(s) will be intensively monitored to verify the permanence of CO_2 storage and increase the world's scientific understanding of CO_2 storage in geologic formations. Varying compositions of the injected CO_2 stream are possible, with the final composition driven by the final facility design.

2.2. Program Goals

The FutureGen facility will be designed to meet the following overall program goals:

- Design, build, and operate a commercial-scale power plant that produces electricity and H_2 with near-zero emissions. The size of the plant (perhaps as large as 275 MW) will be adequate to produce commercially relevant data, including meeting the

requirement for producing 1 million metric tons (MMT) per year of CO_2. The scientific and engineering communities generally agree that this volume of CO_2 is required to adequately validate the integrated operation of the gasification-based power plant and the geologic formation(s) receiving CO_2.

- Consistent with the requirements and capabilities of the major components of the power plant, capture and permanently store at least 90 percent of CO_2 emissions from the plant, with the future potential to capture and permanently store nearly 100 percent.

- Prove the effectiveness, safety, and permanence of CO_2 storage.

- Establish standardized technologies and protocols for CO_2 measuring, monitoring, and verification that document permanent geologic CO_2 storage.

- Validate the engineering, economic, and environmental viability of advanced, coal-based near-zero emission technologies that by 2020 will produce electricity and H_2.

2.3. Implications for FutureGen Facility

Both the overall FutureGen program and the facility have aggressive goals. The successful operation of the plant will build industrial and public acceptance for future near-zero emission coal-fueled power plants of similar design characteristics. In order for this first plant to effectively contribute toward that goal, it needs to provide the broad engineering and scientific basis and understanding for building a new generation of coal-based power plants. Some desired features of the design and siting of the FutureGen facility need to incorporate additional requirements to improve wide applicability and technology transferability. Thus, the siting criteria for the FutureGen plant are far more stringent than criteria that would be used to site future, commercial, near-zero emission coal-fueled power plants. Two examples of more stringent design and siting criteria that apply to the FutureGen facility but that would not apply to future commercial power plants include (1) design flexibility for multiple coal types (i.e., the ability to deliver and operate multiple ranks of coal), and (2) the intent to demonstrate effective CO_2 storage in typical saline formations, which are the most spatially pervasive category of geologic target formations both in the United States and around the world.

Some key determinants for siting the facility include:

- Availability of coal and water resources
- Sound geology for geologic storage of CO_2
- Appropriate infrastructure (e.g., rail, transmission lines, and site access)
- Ready market for electricity

- Favorable business environment, including cost-share opportunities
- Strong community support

3. Qualifying and Scoring Criteria

The proposals will be evaluated against the stated criteria (Parts 1 through 4) and the cost contribution and risk considerations (Part 5) set forth in this section in accordance with the procedures described below. DOE will review the potential environmental impacts of the sites on the Candidate Site List to fulfill its requirements under NEPA regarding the proposed federal action of cost-shared funding for the proposed project.

As explained in Section 1.3, the criteria for site selection are divided into three categories: qualifying criteria (the mandatory requirements for any proposed site to be considered for the facility), scoring criteria (consisting of desirable attributes for the proposed site, on which all offerors who meet the qualifying criteria will be evaluated), and best value assessment criteria. Offerors should ensure that they provide sufficient evidence against the stated criteria in Parts 1 through 4 of this section, and adequately address the best value assessment criteria described in Part 5.

The qualifying and scoring criteria for the FutureGen facility host site are divided into two broad categories: those pertaining to the power plant (all aboveground facilities, including transmission, transportation [road, rail, and barge], and pipeline corridors) and those pertaining to the target CO_2 storage formation(s). Figure 3-1 shows the organization of the qualifying criteria. Figures 3-2 and 3-3 show the organization of the scoring criteria.

The criteria and the data required for each criterion are explained in Parts 1 through 5 of this section. Offerors to the RFP must adhere to the criteria numbering scheme used in this section. **Unless specified otherwise, offerors must present the evidence required against each qualifying and scoring criterion (e.g., Criterion 1.1.1, 1.1.2, etc.) in one page or less, not including supporting documentation.**

The following definitions are applicable:

- *Improved road* means a road rated to carry at least 20-ton trucks.
- *Major surface body of water* is one that is greater than 150 feet (46 meters) deep or greater than 20 square miles (52 square kilometers).
- *Offeror* means an entity that submits a proposal to the Alliance with sufficient information in response to the RFP and is capable of legally executing a contract with the Alliance for the use of the offered site.
- *Owner* means an entity that holds legal title to property.

- *Proposed power plant site* means the minimum 200-acre area needed for the coal-fueled power plant, associated processing facilities, fuel storage, on-site disposal (if available), and a buffer zone.

- *Public access area* (PAA) means a state or local park or national park or preserve, national monument, national seashore, national lakeshore, national wildlife refuge, designated wilderness area, designated wild and scenic river, or study area for any of the preceding designations.

- *Sensitive feature* means a dam, water reservoir, hazardous materials storage facility, or Class 1 injection well.

- *Target formation* means a geologic formation capable of storing CO_2 at the rates and capacities specified in this RFP (see Criteria 2.5.1, 2.5.2, and 2.5.3). Offerors must propose at least one primary deep saline formation and may propose one or more additional target formations of any type. Total injection rate and capacity for target formations in use at one time must equal or exceed 1 MMT of CO_2 storage per year, and the total storage capacity of all target formations in aggregate must equal or exceed 50 MMT of CO_2. Requested information must be provided for each proposed target formation.

- *Suitable transmission line* means one that can carry at least 115 kilovolts (kV) and has adequate capacity to accommodate FutureGen's output without line upgrades.

- *Underground source of drinking water* means an aquifer, or its portion, which (1) serves as a source of drinking water for human consumption, or (2) contains both (a) a sufficient quantity of water to supply a public water system, and (b) fewer than 10,000 milligrams per liter of total dissolved solids or constituents that do not exceed maximum concentration limits specified by the U.S. Environmental Protection Agency (EPA) in National Primary Drinking Water Regulations (40 CFR 141.62).

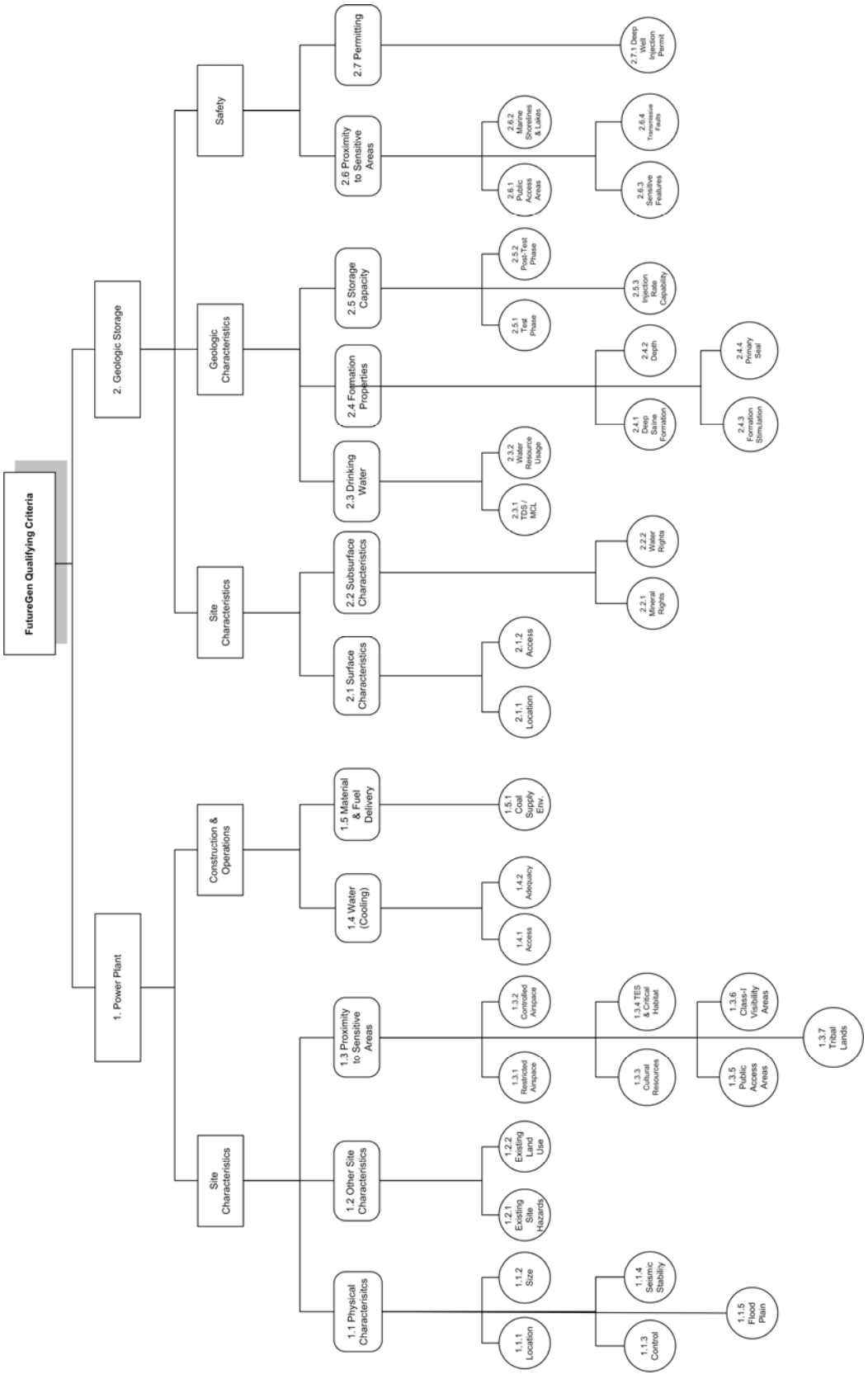

Figure 3-1. Qualifying Criteria for FutureGen Facility

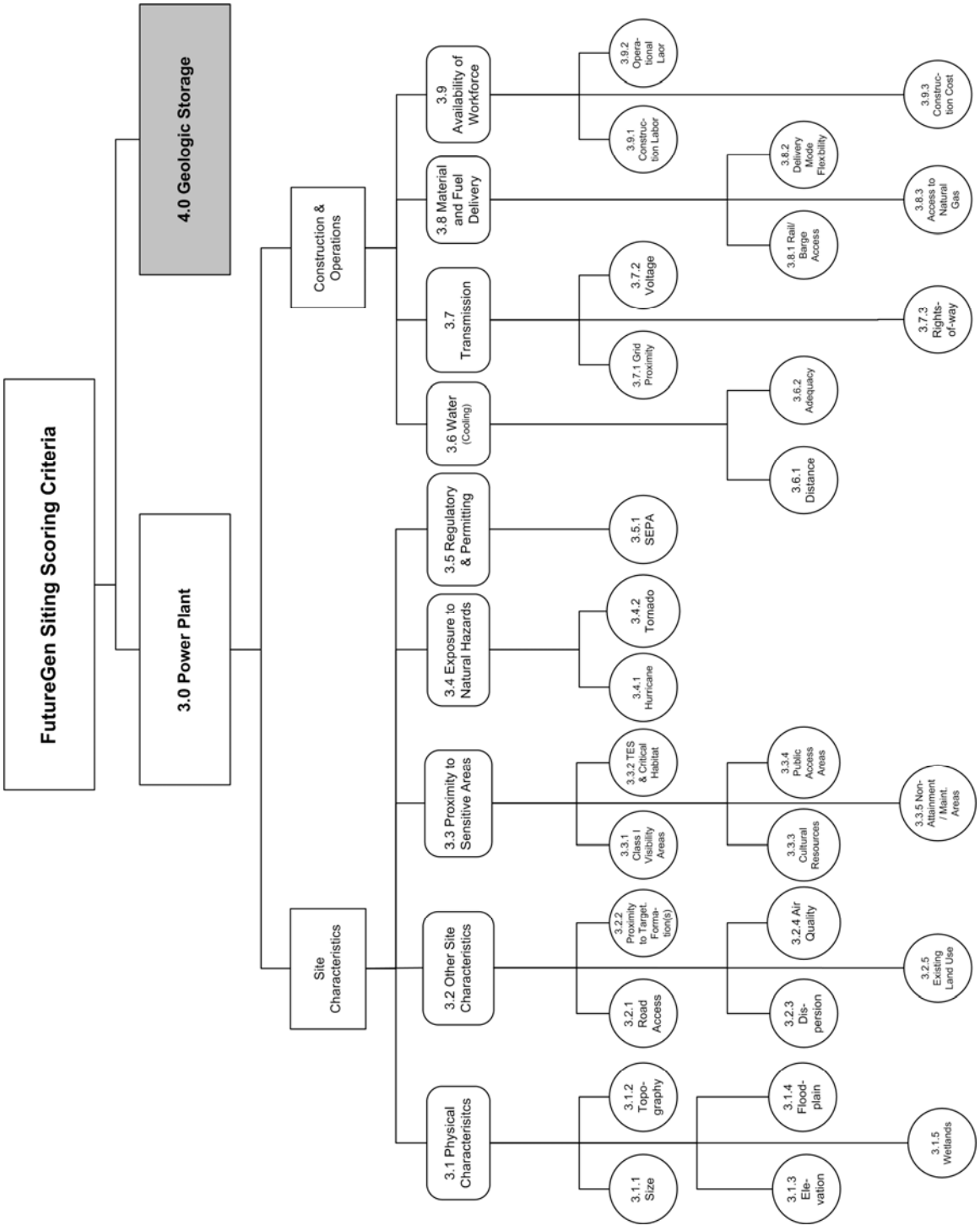

Figure 3-2. Scoring Criteria for FutureGen Facility Power Plant Site

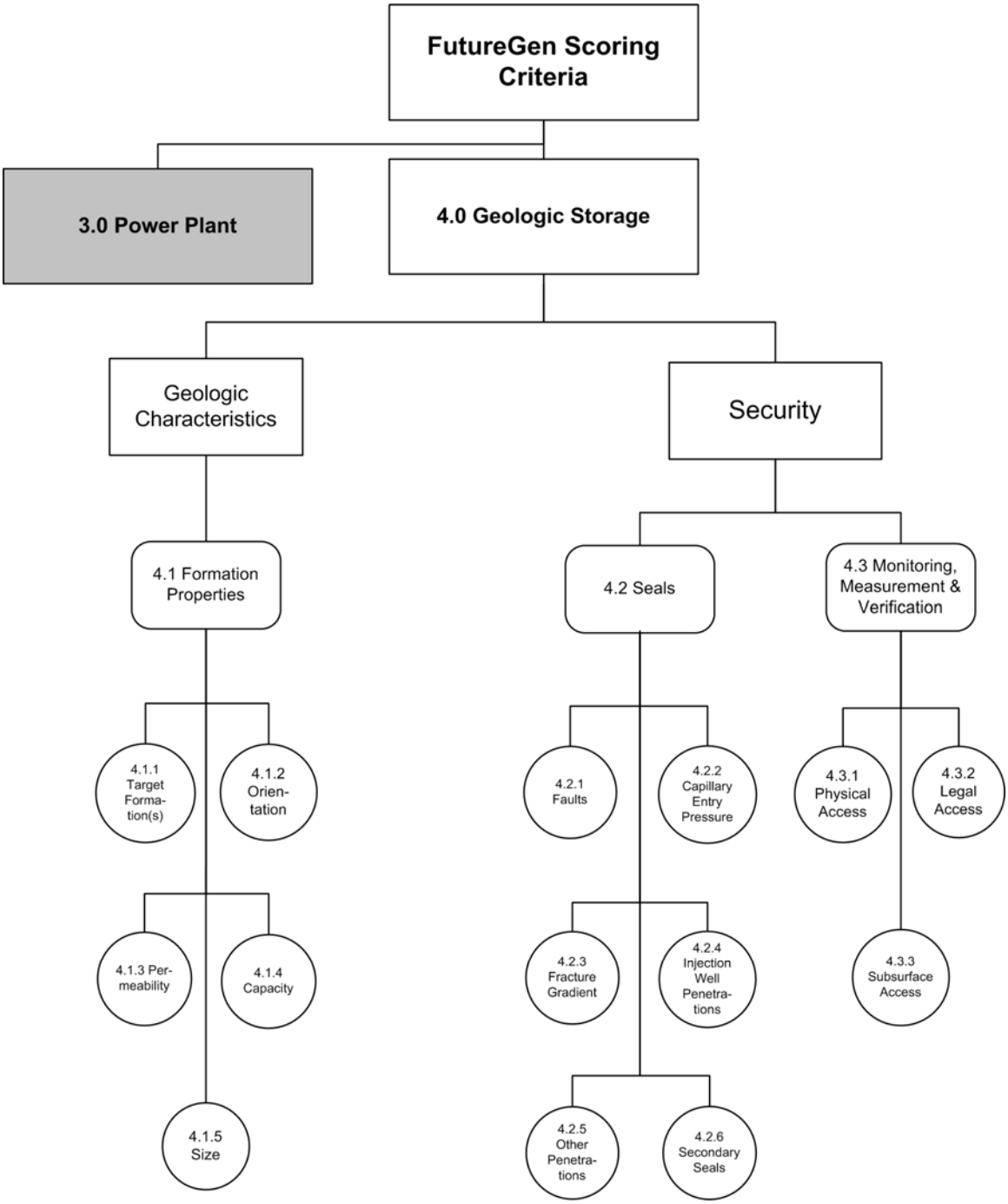

Figure 3-3. Scoring Criteria for FutureGen Facility Geologic Storage

1. PART 1--Power Plant Qualifying Criteria

1.1. Physical Characteristics. Under this category of criteria, offerors must provide the following information:

1.1.1. Geographic Location. The proposed power plant site and the entire CO_2 target formation(s) must be located within the United States with no risk of subsurface migration of CO_2 outside the territory of the United States. The methodology for calculating plume migration is provided in Appendix B. [See also Criterion 2.1.1]

- Required evidence: Provide maps showing the location of the proposed power plant site, including any proposed transportation corridors and corridors for water, CO_2, H_2, and natural gas pipelines and transmission lines to the site. Locations must be shown on the most recent edition of standard United States Geological Survey (USGS) topographic quadrangles at an appropriate scale (e.g., 1:24,000 to 1:250,000).

1.1.2. Size. The area and linear dimensions of the proposed power plant site must accommodate the FutureGen power plant and associated facilities. The proposed site must not be less than 200 contiguous acres. The Alliance has based this acreage on the area required for typical power plants, while taking into account FutureGen's need for additional space for multiple coal piles, research facilities, and carbon capture facilities.

- Required evidence: Same as for Criterion 1.1.1.

1.1.3. Control. The offeror must provide proof that the proposed power plant site is or will be available for the proposed use. The offeror must state the nature (whether to sell, lease, or donate) and terms (including proposed cost) for the transfer of land title or leasehold rights to the Alliance for the proposed site. The offeror must also demonstrate the availability of rights-of-way for all necessary transmission line, transportation, and pipeline (water, CO_2, H_2, and natural gas) corridors.

- Required evidence: Provide preliminary title reports, a land survey plat or plats, and a draft of the contracts that establish the rights to be conveyed. The successful offeror must be able to close the real estate transfers to the Alliance within 180 days of the announcement by the Alliance of the selection of a site to host FutureGen and following the publication of a Record of Decision by the DOE to proceed with the proposed project at a site selected by the Alliance.

1.1.4. Seismic Stability. The proposed power plant site must be free of risk from significant seismic events.

- Required evidence: Provide supporting geological data and calculations demonstrating peak ground acceleration less than 30 percent g, with a 2 percent chance of exceedance in 50 years, based on USGS seismic hazard data.

1.1.5. Floodplain. The proposed power plant site must have low potential for flood damage and plant shutdown. At least 100 contiguous acres of the proposed power plant site must be above the 100-year floodplain.

- Required evidence: Provide documentation demonstrating that at least 100 acres of the proposed power plant site lie above the 100-year floodplain, as indicated on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, USGS flood-prone area maps, or other government-sponsored maps. Areas above delineated 100-year (and if known, 500-year) recurrence interval flood levels should be indicated on the site map(s) prepared in response to Criterion 1.1.1.

1.2. Other Site Characteristics. Under this category of criteria, offerors must provide the following information:

1.2.1. Existing Site Hazards. The site proposed for the facility, whether a greenfield or brownfield site, must be free of hazardous or radioactive chemicals and materials and free of wastes requiring special handling, treatment, and/or disposal. Specifically, the proposed site must not currently be on the National Priorities List established under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). For any proposed site that has been remediated pursuant to CERCLA, the degree of cleanup must satisfy the requirements in Section 121(d) of CERCLA [42 U.S. Code (USC) § 9621(d)]. For any proposed site that has been remediated pursuant to state law, the degree of cleanup obtained must assure protection of human health and the environment. Such assurance is assumed if the degree of cleanup satisfies Section 121(d) of CERCLA. No hazardous wastes identified or listed pursuant to Section 3001 of the Resource Conservation and Recovery Act (RCRA) (42 USC § 6921) may be currently generated, treated, or stored at the proposed site. The proposed site may not currently be subject to regulation by the Nuclear Regulatory Commission (NRC) or by an NRC Agreement State operating pursuant to Section 274 of the Atomic Energy Act.

- Required evidence: Provide documentation demonstrating that the proposed power plant site is free of hazardous or radioactive materials or wastes as described above. The offeror must certify that it is not aware of any unremediated hazardous wastes identified or listed pursuant to Section 3001 of RCRA that have been disposed of at the proposed power plant site.

1.2.2. Existing Land Use. Current use, if any, on the proposed power plant site and surrounding existing land use must be consistent with the construction and operation of the FutureGen facility. If zoning regulations apply to the proposed plant site, the site must be zoned heavy industrial/industrial; alternatively, the offeror must demonstrate that the area could be zoned or rezoned for heavy industrial/industrial use in a timeframe consistent with Alliance and project schedule.

- Required evidence: Submit a copy of a local zoning map showing compatibility with intended use. If no current zoning exists, the offeror must include a letter from appropriate local authority affirming that the proposed site would not conflict with existing land uses.

1.3. Proximity to Sensitive Areas. Under this category of criteria, offerors must provide the following information:

1.3.1. Restricted Air Space. The proposed power plant site must be compatible with existing military restricted use airspace.

- Required evidence: Submit the most current Federal Aviation Administration (FAA) Sectional Chart(s) for the airspace above the site, with the proposed site location annotated on the chart(s).

1.3.2. Controlled Air Space. Assuming a 250-foot maximum height for a startup and test phase stack, the proposed power plant site must be compatible with existing and projected protected airspace of affected airports.

- Required evidence: Use FAA Part 77 Airspace analysis standards to demonstrate compatibility with nearby airports as necessary.

1.3.3. Cultural Resources. The portion of the proposed power plant site that would be physically disturbed must be free of structures that are listed on, or eligible for listing on, the National Register of Historic Places, and be free of known cultural or archeological resources, including Traditional Cultural Properties.

- Required evidence: Submit a recent cultural resources report or concurrence letters from State Historic Preservation Office (SHPO) and/or Tribal Historic Preservation Office (THPO) demonstrating that a significant portion of the proposed power plant site is free of structures that are listed on, or eligible for listing on, the National Register of Historic Places, and are free of known cultural or archeological resources, including Traditional Cultural Properties.

1.3.4. Threatened and Endangered Species (TES) and Critical Habitat. The portion of the proposed power plant site to be disturbed must be free of known federally-listed TES and critical habitat for TES (excluding migratory birds).

- Required evidence: Submit a recent biological survey or a letter from the U.S. Fish and Wildlife Service demonstrating the absence of TES or critical habitat for TES on a significant portion of the site. If TES or critical habitat occurs on the site, the affected areas must be shown on the site survey map submitted under Criterion 1.1.1.

1.3.5. Proximity to Public Access Areas. The proposed power plant site must be located outside of and not adjacent to the boundaries of any PAA.

- Required evidence: Provide a site map showing that the proposed power plant site is not on or adjacent to a PAA. The site survey map provided under Criterion 1.1.1 should indicate the presence of such areas, if any.

1.3.6. Proximity to Class I Visibility Areas. The proposed power plant site must be located at least 60 miles (100 kilometers) beyond the boundaries of any Mandatory Class I Visibility Area.

- Required evidence: Provide the distance to the nearest Class I Visibility Area from proposed power plant site.

1.3.7. Proximity to Tribal Lands. A proposed power plant site located on or adjacent to tribal lands must be supported by the affected Native American tribe(s).

- Provide evidence that the affected tribal government(s) supports the FutureGen plant and associated CO_2 storage activities located on or adjacent to tribal lands.

1.4. Cooling Water. Under this category of criteria, offerors must provide the following information:

1.4.1. Access to Cooling Water. To avoid disruption to plant operations, the proposed power plant site must have access to reliable supplies of industrial water at

minimum sustainable flow rates. Industrial water for the power plant must be available at a sustainable flow rate of not less than 2500 gallons per minute (gpm) 24 hours a day year-round. This quantity of water is based on water requirements at existing integrated gasification combined-cycle coal-fueled power plants. The offeror must provide evidence of sustainable flow rates as indicated above, which will depend on the source of the water supply.

- Required evidence: Identify the proposed water source. For sites with access to public water supplies, include a statement from the public service provider that adequate supply is available and that supply lines of sufficient size exist near the site boundary or a commitment that adequate lines will be installed at no cost to the project. If surface water usage is anticipated from lakes or streams with allocated surface water rights or permits, the proposal must so state and provide proof of an unencumbered right to withdraw water at the minimum sustainable flow rates identified above. If groundwater usage is proposed in a state with allocated groundwater rights, the proposal must so state and provide proof of an unencumbered right to draw water at the minimum sustainable flow rates identified above.

1.4.2. Adequacy under Low Flow Conditions. For the water source identified in Criterion 1.4.1, the offeror must provide evidence that the source is capable of supplying plant make-up requirements of 2500 gpm under low flow conditions.

- Required evidence: For the water source identified under Criterion 1.4.1, provide the 7Q10 statistic for the lowest streamflow for seven consecutive days that occurs on average once every 10 years.

1.5. Material and Fuel Delivery. Under this category of criteria, offerors must provide the following information:

1.5.1. Coal Supply Environment. In order for the FutureGen facility to fulfill its programmatic goals, including reliability, it needs to be capable of operating with more than one major coal rank. Therefore, it is required that more than one major coal rank be able to be delivered to the proposed plant site by more than one transportation mode, at competitive prices. Generally, sites with access to competing fuel transporters and alternate, low-cost fuels are preferable to sites without this access.

- Required evidence: Provide evidence that more than one major coal rank can be delivered to the proposed power plant site by more than one transportation mode. Discuss the cost of fuel per ton and the cost of transporting the fuel for

each system (e.g., rail, truck, and/or barge) capable of servicing the proposed site, for each fuel projected to be used (e.g. anthracite, bituminous, sub-bituminous, or lignite).

2. PART 2—Geologic Storage Qualifying Criteria

Offerors must propose at least one primary deep saline formation and may propose one or more additional formations of any type. Requested information must be provided for each proposed target formation.

2.1. Surface Characteristics. Under this category of criteria, offerors must provide the following information:

2.1.1. Location. The proposed geologic formation(s) must be located within the United States with no risk of subsurface migration of CO_2 outside the territory of the United States. Based on the professional judgment of technical experts, the Alliance believes that a 50-MMT CO_2 plume would have a very low probability of migrating up to 10 miles (16 kilometers) from the bottomhole of an injection well. Because FutureGen is a first-of-a-kind demonstration project and because monitoring wells may need to be placed at the maximum extent of the expected plume, the Alliance believes that an injection well should be no closer than 20 miles (32 kilometers) from a U.S. border as a conservative safe distance. The methodology for calculating plume migration is provided in Appendix B. [See also Criterion 1.1.1]

- Required evidence: Provide a map showing the location of the proposed power plant site and the proposed target formation(s) (see also Criterion 1.1.1). Locations must be shown on the most recent edition of a standard USGS topographic map at an appropriate scale. Provide a conceptual well configuration plan to meet the CO_2 storage capacity and injectivity requirements described in Criteria 2.5.1 through 2.5.3. The location of any injection well in this plan must be a minimum distance of 20 miles (32 kilometers) from a U.S. border.

2.1.2. Access. While ownership of the land above the projected subsurface CO_2 plume is not required, the Alliance must have sufficient access to the land surface above the proposed target formation(s) to implement a rigorous monitoring program. At least 60 percent of the land above the proposed target formation(s) must be physically accessible for installation of surface and subsurface monitoring equipment.

- Required evidence: Provide a USGS map at an appropriate scale showing access restrictions to the land above the proposed target formation(s). Access restrictions include, but are not limited to, lakes, rivers, or other bodies of water, PAAs, and infrastructure including roads, buildings, or other developed property. Identify the type (local, state, or federal government or private) and number of landowners above the target formation(s) and any known landowner-imposed access restrictions to the site.

2.2. Subsurface Site Characteristics. This category of criteria is designed to ensure the free and unencumbered rights of the Alliance to use the proposed target formation(s) for injection and storage of CO_2. Under this category of criteria, offerors must provide the following information:

2.2.1. Mineral Rights. The offeror must own or have a demonstrated ability to obtain, purchase, or obtain a waiver of subsurface mineral rights within and immediately adjacent to proposed target formation(s) to accommodate an injection capacity of 50 MMT of CO_2. The requirement applies to mineral rights within all target formations and immediately above the shallowest primary seal, as well as to mineral rights below the target formations if mineral resources below cannot be reasonably or securely accessed without disrupting the integrity of the target formation and the primary seal.

- Required evidence: Provide proof of ownership or ability to obtain by purchase, lease, or eminent domain the subsurface mineral rights in the area encompassing the proposed target formation(s). Provide proof of title (mineral rights), contract options to purchase, or letters of commitment from governmental authorities with the power of eminent domain. Provide proof of rights or waiver of rights to underlying mineral deposits (e.g., oil, gas or coal), if these resources cannot be reasonably or securely accessed by the current title holder after the CO_2 storage occurs.

2.2.2. Water Rights. The offeror must own or have a demonstrated ability to obtain, purchase, or obtain a waiver of subsurface water rights within and immediately adjacent to the proposed target formation(s) to accommodate the injection of 50 MMT CO_2. The requirement applies to water rights within all target formations and immediately above the shallowest primary seal, as well as to water rights below the target formations if water resources below cannot be reasonably or securely accessed without disrupting the integrity of the target formation and the primary seal.

- Required evidence: Provide proof of ownership or ability to obtain by purchase, lease, or eminent domain any subsurface water rights in the area encompassing the proposed target formation(s). Provide proof of title, contract options to purchase, or letters of commitment from governmental authorities with the power of eminent domain. Provide proof of rights, or waiver of existing rights, to underlying water, if this resource cannot be reasonably or securely accessed by the current title holder after the CO_2 storage occurs.

2.3. Drinking Water. This category of criteria is designed to protect current and future sources of drinking water. The offeror must provide reasonable evidence that the proposed target formation(s) is not a current or future source of drinking water. The following criteria address this requirement.

2.3.1. Total Dissolved Solids or Maximum Concentration Levels. Proposed target formation(s) must not be an underground source of drinking water.

- Required evidence: Provide evidence that the proposed target formation(s) is not a current source of drinking water or an underground source of drinking water.

2.3.2. Water Resource Usage. The broad definition of an underground source of drinking water was mandated by Congress to ensure that future underground sources of drinking water would be protected, even where those aquifers are not currently being utilized as a drinking water source or could not be used without some form of water treatment.

- Required evidence: Provide evidence that the proposed target formation(s) is not a potential source of drinking water. In addition, identify water resources listed by the local water board that will be used to meet local water usage needs for the next 10 years.

2.4. Formation Properties. Under this category of criteria, offerors must provide the following information:

2.4.1. Deep Saline Formation. At least one proposed target formation must be a geologically distinct deep saline formation suitable for CO_2 injection.

- Required evidence: Provide evidence that at least one proposed target formation is a deep saline formation capable of meeting at least 60 percent of the injectivity and capacity requirements given in Criteria 2.4.2 through 2.5.3.

2.4.2. Depth. CO_2 is a supercritical fluid at temperatures above 31°C and a pressure of approximately 73 atm. To help ensure consistent physical properties for the CO_2 in the proposed target formation, and to facilitate modeling of the CO_2 injection and dispersal within the target formation, the primary deep saline formation must have in situ hydrostatic pressure and temperature conditions above the CO_2 critical point.

- Required evidence: Provide pressure and temperature data for the primary deep saline formation. The shallowest portion of the target formation below the primary seal must be above the CO_2 critical point.

2.4.3. Formation Stimulation. The proposed primary deep saline formation must have sufficient storage capacity to meet the project goals without dependence on large-scale physical or chemical stimulation techniques.

- Required evidence: Provide calculations and supporting geologic data that minimal injectivity targets of 1 MMT CO_2 per year can be met in the primary deep saline formation, with hydraulic fracture stimulation, acoustic stimulation, or chemical stimulation accounting for no more than 25 percent of the injectivity goal.

2.4.4. Primary Seal. The proposed target formation(s) must have a primary seal (caprock) capable of long-term containment of the injected CO_2. A primary seal must have sufficient thickness (greater than 20 feet [6 meters]), be regionally extensive, and be continuous over the entire projected CO_2 plume boundary after injection of 50 MMT of CO_2. It also must have sufficiently low vertical permeability and have sufficiently high capillary entry pressure to provide a barrier to the migration of CO_2 out of the target formation.

- Required evidence: Provide calculations and supporting hydrogeologic data demonstrating the hydraulic characteristics, quality, and continuity of the primary seal.

2.5. **Storage Capacity**. The proposed target formation(s) must have sufficient capacity for CO_2 storage to ensure that project goals are met. Total injection rate and capacity for target formations in use at one time must equal or exceed 1 MMT of CO_2 storage per year. Total storage capacity of all target formations in aggregate must equal or exceed 50 MMT. Therefore, under this category of criteria, offerors must provide the following information:

2.5.1. Storage Capacity During Test Phase. FutureGen project goals call for injecting a minimum of 1 MMT CO_2 per year over the project Test Phase, which consists of the first four years after startup.

- Required evidence: Provide calculations and supporting hydrogeological data demonstrating CO_2 storage capacity of at least 4 MMT in the proposed target formation(s) over the first four years of the project (test phase). Hydrogeological data used in the calculation must be based on well logs, core data, or field testing data representative of the target formation(s) obtained within 10 miles (16 kilometers) of the proposed injection well(s) for the demonstration phase unless geological data show convincing evidence of regional lateral continuity of target formation properties, in which case data may be obtained from areas within this region of proven lateral continuity.

2.5.2. Storage Capacity Post-Test Phase. Power plants have a typical operating life of at least 30 years. The FutureGen facility will be designed and constructed in a manner that allows operation for this timeframe. Should CO_2 capture and storage continue past the Test Phase, storage capacity is required to meet this objective.

- Required evidence: Provide calculations and supporting hydrogeological data demonstrating CO_2 storage capacity of at least 50 MMT in the target formation(s) over the minimum 30-year life of the plant. Hydrogeological data used in the calculations must be based on well logs, core data, or field testing data representative of the regional geological setting of the proposed target formation(s).

2.5.3. Injection Rate Capacity. In addition to the required total storage capacity of the site (see Criteria 2.5.1 and 2.5.2), the proposed target formation(s) also must support a CO_2 injection rate goal of 1 MMT of CO_2 per year for up to 30 years.

- Required evidence: Provide calculations and supporting hydrogeological data that demonstrate the ability to safely inject a minimum of 1 MMT of CO_2 per year. The well configuration (number of wells, horizontal, deviated, or vertical orientation) required to obtain this injection rate must also be provided.

2.6. Safety and Security. The Alliance is committed to ensuring the security of the injected CO_2 in the target formation(s) and minimizing the risk to the surrounding environment. Therefore, under this category of criteria, offerors must provide the following information:

2.6.1. Public Access Areas. The land above the proposed target formation(s) must not be on a PAA. The bottomhole location of any injection well must be no closer than

10 miles (16 kilometers) from any PAA. Based on the professional judgment of technical experts, the Alliance believes that a 50-MMT CO_2 plume would have a very low probability of migrating up to 10 miles (16 kilometers) from the bottomhole of an injection well. Because this is a first-of-a-kind demonstration project, 10 miles was chosen as a conservative safe distance.

- Required evidence: Provide a topographic map at an appropriate scale showing the location and plan outline of all PAAs relative to the proposed target formation(s) and planned injection wells.

2.6.2. Marine Shorelines and Lakes. The proposed target formation(s) must not intersect marine shorelines or other major surface bodies of water. The bottomhole location of any injection well must be no closer than 10 miles (16 kilometers) to marine shorelines and major surface water bodies. Based on the professional judgment of technical experts, the Alliance believes that a 50-MMT CO_2 plume would have a very low probability of migrating up to 10 miles (16 kilometers) from the bottomhole of an injection well. Because this is a first-of-a-kind demonstration project, 10 miles was chosen as a conservative safe distance.

- Required evidence: Provide a topographic map at an appropriate scale showing outlines of marine shorelines and major surface bodies of water relative to the proposed target formation(s) and planned injection wells. Provide evidence either that (1) CO_2 cannot impact any body of water due to the presence of primary or secondary seals, or (2) the plume migration will not intersect an overlying lake.

2.6.3. Sensitive Features. The land above the proposed target formation(s) must not intersect dams, water reservoirs, hazardous materials storage facilities, Class 1 injection wells, or other sensitive features. The bottomhole location of any injection well must be no closer than 10 miles (16 kilometers) to any sensitive feature. Based on the professional judgment of technical experts, the Alliance believes that a 50-MMT CO_2 plume would have a very low probability of migrating up to 10 miles (16 kilometers) from the bottomhole of an injection well. Because this is a first-of-a-kind demonstration project, 10 miles was chosen as a conservative safe distance.

- Required evidence: Provide a topographic map at an appropriate scale showing the location of the proposed target formation(s) and planned injection wells relative to regional sensitive features. For Class 1 wells, a letter from the Underground Injection Control (UIC) permitting agency stating that there are no Class 1 wells intersecting the target formation is sufficient.

2.6.4. Relation of Primary Seal to Active or Transmissive Faults. The primary seal must not be intersected by any known historically active or hydraulically transmissive faults.

- Required evidence: Submit a geologist's summary documenting that no known active or transmissive faults intersect the primary seal.

2.7. Permitting. Deep well injection permits are a prerequisite to undertaking injection of CO_2 into any target formation. Therefore, under this category of criteria, offerors must provide the following information:

2.7.1. Deep Well UIC Permits. The offeror must have a demonstrated ability to obtain applicable UIC permits.

- Required evidence: Provide evidence that applicable state or federal law allows wells of the type needed to inject the proposed volumes of CO_2 into the target formation(s).

3. PART 3—Power Plant Scoring Criteria

3.1. Physical Characteristics. Under this category of criteria, offerors must provide the following information:

3.1.1. Size. This criterion addresses the availability of additional acreage at the proposed power plant site to support future expandability of the facility. Larger sites are preferred.

- Data requested: Provide the total area available at the proposed location.

3.1.2. Topography. This criterion address how much groundwork will be required at the site before it is suitably graded for facility construction. Flat sites requiring little or no grading are preferred.

- Data requested: Provide the ground slope (in percent) across the proposed power plant site as indicated by the topographic map.

3.1.3. Elevation. The performance efficiency of the power plant is lower at high altitudes. It is therefore desirable to locate the facility at an elevation less than 5000 feet (1520 meters) above sea level.

- Data requested: Provide elevation ranges across the proposed power plant site, as indicated by the topographic map.

3.1.4. Floodplains. It is preferable that as much of the proposed power plant site as possible be located above the 100- and 500-year floodplains, in order to maximize safety and flexibility in locating critical plant facilities.

- Data requested: Provide the area above 100- and 500-year floodplain at the proposed power plant site.

3.1.5. Wetlands. It is preferable that adverse impacts to wetlands be avoided as much as possible.

- Data requested: Provide the number of acres of wetlands present on the proposed power plant site and within any new proposed transmission line, transportation, or pipeline corridors and describe the quality of each wetland area.

3.2. Other Site Characteristics. Under this category of criteria, offerors must provide the following information:

3.2.1. Road Access. It is preferable that improved roads providing access to the proposed power plant site are as close to the site boundary as possible. Sites with improved roads closest to the site will score more highly.

- Data requested: Provide the distance from site boundary to the nearest improved road.

3.2.2 Proximity to Proposed Target Formation. While it is not necessary for the target formation to immediately underlie the proposed site for the FutureGen facility, it should be close to the proposed power plant site in order to facilitate construction of pipelines. It is preferable for cost and construction considerations for the proposed power plant site and the proposed target formation to be as close as possible.

- Data requested: Provide the distance from the power plant site to the proposed CO_2 injection site. Show the proposed CO_2 pipeline corridor on a map of appropriate scale.

3.2.3 Air Dispersion. Any air emissions from the facility will disperse more readily under favorable terrain conditions. The difference in terrain elevation within 1 mile (1.6 kilometers) of the power plant site will be compared to an assumed stack height of 250 feet (76 meters). This comparison will serve as a proxy for air dispersion modeling during this stage of the site selection process.

- Data requested: Provide the highest terrain elevation at and within one mile of the proposed site.

3.2.4 Air Quality. The existing air quality at the site is a key determinant of the ease and ability to obtain the necessary air quality permits.

- Data requested: Using the nearest criteria air pollutant monitoring data that is representative of the proposed site, provide the attainment status of the proposed site with respect to all National Ambient Air Quality Standards (NAAQS).

3.2.5 Existing Land Use. It is preferable to have the FutureGen facility located on a site where it will be consistent with surrounding land uses.

- Data requested: Provide a description of the existing land uses within one mile of the boundaries of the proposed power plant site and identify these on a map of appropriate scale.

3.3. Proximity to Sensitive Areas. Under this category of criteria, offerors must provide the following information:

3.3.1. Class I Visibility Areas. It is preferable to locate the FutureGen facility as far as possible from the boundaries of any Mandatory Class I Visibility Area.

- Data requested: Provide the distance from the site boundary to the boundary of the closest Mandatory Class I Visibility Area.

3.3.2. TES and Critical Habitat. It is preferable to have no documented TES or critical habitat on any part of the proposed plant site or in any transmission, transportation, or pipeline corridor.

- Data requested: Provide information on documented occurrences of TES or critical habitat on or within one mile of the proposed power plant site boundary or any new transmission line, transportation, or pipeline corridor. Include a discussion of any potential mitigation actions if such occurrences are on the site or within a corridor.

3.3.3. Cultural Resources. It is preferable that the documented occurrence of cultural, historical, or archaeological resources or Traditional Cultural Properties be such as to allow maximum flexibility in locating various parts of the facility at the proposed site.

- Data requested: Provide information on documented occurrences of cultural, historical, or archaeological resources or Traditional Cultural Properties on or within one mile of the proposed power plant site boundary or any new transmission line, transportation, or pipeline corridor. Include a discussion of any potential mitigation actions if such occurrences are on the site or within a corridor.

3.3.4. Public Access Areas. It is preferable to locate the FutureGen facility as far as possible from the boundaries of designated PAAs.

- Data requested: Provide the distance from the proposed site and any new transmission line, transportation, or pipeline corridor to the nearest PAA.

3.3.5. Non-Attainment / Maintenance Areas. It is preferable to locate the FutureGen facility as far as possible from any EPA-designated non-attainment or maintenance areas.

- Data requested: Provide the distance from the plant to the nearest border of the nearest area listed by the EPA as either a non-attainment area or as a maintenance area for any criteria air pollutant.

3.4. Exposure to Natural Hazards. In order to minimize any risks to the project, it is preferable to site the FutureGen facility in an area with minimal risks of natural hazards. Under this category of criteria, offerors must provide the following information:

3.4.1. Hurricanes. The proposed power plant site should not pose an undue risk of damage to the FutureGen facility due to hurricanes. Sites with lower hurricane risk are more favorable that those with higher risk.

- Data requested: Provide the site designation, if any, by the U.S. Landfalling Hurricane Probability Project.

3.4.2. Tornadoes. The proposed power plant site should not pose an undue risk of damage to the FutureGen facility due to tornadoes. Sites with lower tornado risk are more favorable that those with higher risk.

- Data requested: Using the Fujita (F) scale, provide the number and intensity of tornadoes classified as F2 and higher that have occurred within 1000 square miles (2600 square kilometers) of the area encompassing the proposed site over the last five years.

3.5. Regulatory and Permitting. Under this category of criteria, offerors must provide the following information:

3.5.1. State Environmental Policy Act (SEPA). The imposition of any requirements of SEPA (where applicable) on the construction and operation of the FutureGen facility can impact project and/or schedule.

- Data requested: Discuss the requirements of the applicable SEPA (if any), its comparability to NEPA documentation, and whether both sets of requirements can be addressed simultaneously.

3.6. Cooling Water. Under this category of criteria, offerors must provide the following information:

3.6.1. Distance to Water Source. It is preferable to have the identified source for the cooling water be as close the site as possible.

- Data requested: Provide the distance to the water source identified under Criterion 1.4. Show the proposed water line corridor from the water source to the proposed power plant site on a topographic map of appropriate scale.

3.6.2. Volume of Water Available. Flexibility in meeting cooling water requirements is desirable. It is preferable that water be available in excess of the minimum 1500 gpm [Criterion 1.4.2].

- Data requested: Provide the location and quantity of available water in excess of 1500 gpm and demonstrate its availability to the project.

3.7. Transmission. Under this category of criteria, offerors must provide the following information:

3.7.1. Grid Proximity. It is preferable for the transmission grid to be as close as possible to the proposed power plant site in order to minimize line construction efforts and right-of-way issues.

- Data requested: Propose one or more power transmission line corridors extending from the proposed power plant site to the suggested point(s) of interconnection with the existing grid and provide the lengths of each proposed corridor. Delineate these corridors on USGS topographic maps (either 7.5-minute quadrangles or 1:100,000 or 1:250,000 scale, as appropriate).

- Data requested: To address the siting and construction of new power transmission lines, identify (by citation) potentially applicable laws, regulations, and ordinances related to the siting and construction of power transmission lines; state the relevant purposes of each law, set of regulations, or ordinances; identify the regulatory agency for each permit, regulatory process, or ordinance; and provide a general description of relevant regulatory processes (applicant, fees, typical requirements of the owner/operator of the transmission line, type of public participation, duration of permits and renewal periods, typical application processing time, associated approvals, etc.) or explain the steps to securing permits.

3.7.2. Voltage. It is preferable to be able to connect to higher voltage transmission lines.

- Data requested: Provide the rating (765 kV / 345 kV / 230 kV / 138 kV / 115 kV line) for the identified transmission line(s) within 15 miles (24 kilometers) of the proposed power plant site.

3.7.3. Rights-of-Way. In addition to identifying a suitable connection point and transmission line, offerors must also address the siting and construction of new power transmission lines.

- Data requested: Discuss the length of proposed transmission line connection corridors, and the fraction of the identified corridors for which the offeror has obtained or can obtain rights-of-way.

3.8. Material and Fuel Delivery. Construction and operations costs for the FutureGen facility are inherently dependent on the costs of delivery materials and fuel to the proposed site.

3.8.1. Distance to Rail and/or Barge Delivery. Rail or barge delivery is generally the most economical mode of delivery for fuels and materials to the site.

- Data requested: Submit a USGS map at an appropriate scale showing the nearest rail corridor and/or barge delivery point. If a rail corridor is proposed to be built as part of the proposal, include a USGS map at an appropriate scale showing the proposed rail corridor. In addition, describe the process for building the proposed corridor, including applicable laws and regulations, permit applications, and timeframe for applications, approvals, and construction.

3.8.2. Delivery Mode Flexibility. Sites with access to competing fuel transporters are preferable to sites without such access.

- Data requested: Discuss possible delivery modes to the site, including the number of viable rail or barge options or truck options.

3.8.3. Access to Natural Gas Pipeline. The coal-gasification facilities to be utilized by the FutureGen plant require natural gas as a start-up fuel. Based on the nominal capacity of the FutureGen facility, a minimum of 500 standard cubic feet per minute (SCFM) at 450 pounds per square inch (psi) of natural gas from a natural gas pipeline will be required. Up to 30,000 SCFM at 450 psi may be desirable. In order to minimize the costs and rights-of-way issues with construction of a natural gas pipeline, proximity to an existing pipeline is preferable.

- Data requested: Submit a USGS map at an appropriate scale showing the nearest natural gas pipeline(s) to the site with sufficient capacity to serve the FutureGen facility. Show the proposed natural gas line corridor from the existing pipeline to the proposed power plant site on a topographic map of appropriate scale.

3.9. Availability of Workforce. Availability of a sufficient quantity of labor during construction and operation, and the prevailing labor costs in the region, are important considerations in the economics of the project. Generally, sites with access to an adequate supply labor at a competitive cost are preferred. Offerors must provide data against the following criteria:

3.9.1. Construction Labor Availability. Sites must have access to an adequate supply of construction labor, which is generally more readily available in high-population areas.

- Data requested: Provide the distance from the proposed power plant site to the nearest population center of at least 20,000 people and the nearest population center of at least 50,000 people.

3.9.2. Operations Labor Availability. Operations labor generally requires a more specialized skill set and can be more readily found in higher-population areas.

- Data requested: Provide the distance from the proposed power plant site to the nearest population center of at least 50,000 people and the nearest population center of at least 100,000 people.

3.9.3. Construction Cost. Sites with lower construction costs are preferred.

- Data requested: Provide the relative cost of heavy construction projects in the area, as compared to the RSMeans U.S. 30-city average.

4. PART 4—Geologic Storage Scoring Criteria

The organization of the geologic storage scoring criteria is shown in Figure 3-3. Offerors must propose at least one primary deep saline formation and may propose one or more additional formations of any type (such as enhanced oil recovery, enhanced coal-bed methane, or coal seams). Requested information must be provided for each proposed target formation, as applicable.

In addition to the basic geological properties required to satisfy the qualifying criteria, sites that have enhanced characteristics that improve the ability or lower the cost to meet the objectives of the FutureGen project will receive higher scores by the Alliance. These characteristics are described below.

4.1. Formation Properties

This category describes properties of the proposed target formation(s) at the site that further the objectives of the Alliance and improve the probability of meeting injectivity and capacity goals for the project.

4.1.1. Proposed Target Formations. The Alliance requires the existence of at least one deep saline formation capable of storing a minimum of 60 percent of the total injection target of 50 MMT of CO_2. The Alliance will assign higher scores to sites with a diversity of geologic target formations with differing potential trapping mechanisms than to sites with fewer geologically distinct storage target formations.

- Data requested: If additional target formations are proposed, provide the distance to the additional target formations and a geologist's summary indicating that each additional proposed target formation can support at least 25 percent of the capacity and injectivity targets described in Criteria 2.5.1 through 2.5.3.

4.1.2. Orientation. The distribution and migration of CO_2 in the primary deep saline formation are greatly influenced by the structural dip of the formation strata. Except for anticlinal closures, the Alliance will assign higher scores to sites with lower average structural dip, unless sufficient evidence is provided of a structural or stratigraphic trapping mechanism that would prevent up-dip migration of the CO_2.

- Data requested: Provide supporting geological data and calculations documenting the average structural dip of the deep saline formation bed

(excluding anticline closures) across the proposed formation. Provide evidence of structural or stratigraphic trapping mechanisms that would prevent up-dip migration of the CO_2.

4.1.3. Permeability. The magnitude and spatial variability of target formation permeability greatly influence injectivity of CO_2, associated bottomhole well pressure required to meet the injection rate target of 1 MMT per year, and residual CO_2 saturations. The Alliance will assign higher scores to sites with thick target formation intervals characterized by good matrix permeabilities in the primary deep saline formation than to sites characterized by low permeabilities (less than 20 millidarcies [mD]). Additional consideration will be given to sites that have moderate matrix permeabilities but are representative of a large percentage of the potential deep saline formations in the United States.

- Data requested: Provide supporting data and/or calculations of expected average gas permeability (in millidarcies) in the primary deep saline formation and for each additional target formation if such data is available.

4.1.4. Capacity. Over the lifetime of the FutureGen plant, it is possible that over 100 MMT of CO_2 may be captured and potentially stored. Consequently, the Alliance will assign higher scores to sites that provide supporting hydrogeological data and calculations documenting CO_2 storage capability greater than the 50 MMT minimum required under the Qualifying Criteria (Criterion 2.5.2).

- Data requested: Provide geological data and calculations documenting CO_2 storage capability in the target formation(s).

4.1.5. Plume Size. For a variety of reasons associated with cost, access, liability, and schedule, the Alliance will assign higher scores for target formations with hydrogeological characteristics that result in a smaller overall land surface footprint above the proposed formation(s) than to those with characteristics that require a larger footprint to meet the injectivity and capacity goals set by the Alliance.

- Data requested: Provide calculations showing the areal extent of the CO_2 plume after 50 MMT of CO_2 injection, using the methods shown in Appendix B. Offerors may use alternative methods of performing the plume calculation provided the methods and supporting data are documented in the offeror’s proposal.

4.2. Seals

The risk of CO_2 leakage from the target formation(s) is highest from faults and fractures, rupture of the seal through overpressure-induced failure, and borehole penetrations. This category of criteria is designed to help rank the quality of primary and secondary seal integrity and evaluate the suitability of the proposed site for monitoring, measuring, and verifying the fate of the injected CO_2. Under this category of criteria, offerors must provide the following information:

4.2.1. Faults. The Alliance will evaluate the offeror's summary of faults and fracture zones affecting the injection field and will assign higher scores to sites with a low risk of fault-induced failure of CO_2 containment.

- Data requested: Provide supporting data from a geologist on the number and geologic character of seismically detectable faults or major fracture zones intersecting primary seals. This includes both sealing and non-sealing faults.

4.2.2. Capillary Entry Pressure. To prevent permeation of CO_2 through a primary seal, injection pressures required to meet the 1 MMT CO_2 per year injection rate target must remain below the capillary entry pressure of the overlying primary caprock seal. The Alliance will assign higher scores to injection fields having a seal with a larger ratio of capillary entry pressure versus peak bottomhole pressure required to meet the injectivity target.

- Data requested: Provide data on the capillary entry pressure of primary seal(s) for the principal deep saline formation and seals for any other proposed target formation. This includes both lithologic and fault seals. Acceptable data include direct laboratory measurements, data calculated from engineering and well log sources, or estimations from physical properties of closely related analog rock types, provided that the analogs are reliably representative of the lithology at the proposed site. Using supporting data and calculations, provide estimates of expected peak bottomhole pressures in each target formation required to meet the injectivity target for the target formation.

4.2.3. Fracture Gradient. Rupture of the primary overlying seal through injection-related overpressure is one of the primary risks in CO_2 leakage. Proposed sites that demonstrate low differential in situ caprock or target formation stress and high mechanical seal strength relative to injection pressure will be ranked higher by the Alliance.

- Data requested: Provide supporting data and calculations on the strength of primary caprock seals relative to regional and local stress fields. Based on a

conceptual well plan layout, include expected peak bottomhole pressure, primary seal stresses (fracture gradient in pounds per square inch per foot is acceptable), mechanical properties of the seals, and results of fracture tests, if available.

4.2.4. Injection Well Penetrations. The Alliance will assign higher scores to proposed sites that require fewer penetrations of the primary seals by injection wells to meet injectivity targets.

- Data requested: Provide number and type (vertical, horizontal with projected lateral reach) of injection wells required to meet the injection rate target of 1 MMT per year and to meet the capacity target of 50 MMT CO_2.

4.2.5. Other Penetrations. Proposed sites that have fewer penetrations of the primary seals by active or abandoned non-project wells are considered to have lower risk of CO_2 leakage and will require less well characterization and remediation activity. The Alliance will assign higher scores to such sites.

- Data requested: Provide a map showing the location, depth, type (injection or production), deviation and lateral reach, and operating status (active, shut-in, temporarily abandoned, abandoned, or plugged and secured pursuant to an approved plan) of all wells that penetrate the primary seal over the projected plume area after injection of 50 MMT CO_2.

4.2.6. Secondary Seals. Secondary seals provide additional backup containment of the CO_2 should an unlikely failure of the primary seal occur during or after CO_2 injection. Consequently, the Alliance will assign higher scores to sites that provide evidence of secondary seals. To be considered, secondary seals must: overlie the primary caprock seal(s), be largely continuous, be greater than 10 feet (3 meters) thick throughout, and cover at least 75 percent of the projected plume after injection of 50 MMT CO_2.

- Data requested: Provide supporting data on secondary seals, if present. Include the number of seals, thickness and lithology, and estimated extent.

4.3. Monitoring, Mitigation, and Verification

The ability to monitor each target formation and measure and verify the location and movement of stored CO_2 is important in storage management. Therefore, in this section, offerors are requested to provide data and documentation of surface accessibility above the target formation(s), and accessibility to the subsurface for monitoring.

4.3.1. Physical Access. While ownership of the land above the CO_2 plume is not required, the Alliance prefers sites that have unrestricted access to the land surface above the proposed target formation(s) to implement a rigorous monitoring program. The comprehensive monitoring program will likely include installation of monitoring wells in strategic locations around the site in addition to atmospheric and shallow subsurface monitoring stations. The Alliance will assign higher scores to sites where more than 60 percent of the land above the proposed target formation(s) is physically accessible for the installation of surface and subsurface monitoring equipment.

- Data requested: Provide maps and other evidence for the percentage of the surface above the projected 50-MMT CO_2 plume that is physically accessible for installation of surface and subsurface monitoring equipment. Access restrictions include, but are not limited to, lakes, rivers, or other bodies of water, PAAs, and infrastructure including roads, buildings, or other developed property.

4.3.2. Legal Access. The Alliance will assign higher scores to sites whose landowners will allow periodic access to portions of their property for monitoring, mitigation, and verification activities for at least 15 years following the startup of the FutureGen facility.

- Data requested: Provide documentation of landowner permission in principle to periodic access to portions of their property for monitoring, mitigation, and verification activities for at least 15 years following the startup of the FutureGen facility.

4.3.3. Subsurface Access. Installation of monitoring well facilities requires not only landowner permission but appropriate geological conditions for drilling, well completion, and instrument installation. Sites that are well suited for monitoring well installation will receive higher scores than sites where monitoring well installation is less physically or economically achievable.

- Data requested: Provide a geologic descriptive summary of subsurface horizons above the topmost primary seal, with special attention to areas that would not be suitable/accessible for installation of monitoring wells.

5. PART 5—Best Value Assessment Criteria

In addition to the qualifying criteria and the scoring criteria detailed in Parts 1 through 4, the Alliance will conduct a best value assessment to develop the Candidate Site List. The

best value assessment criteria, while not indicators of the technical merits of proposed power plant sites, may be essential to the process of selecting the sites that will best achieve FutureGen objectives. Such factors may be beyond the control of the offeror. Offerors should recognize that some very good proposed sites may not be selected for the Candidate Site List or, ultimately, to host the FutureGen facility because they do not maximize the probability of achieving the overall objective of cost-effectively producing electricity and H_2 from coal while capturing and permanently storing CO_2 in a deep geologic formation. Thus, the following best value assessment criteria will be used after the qualifying and scoring criteria are applied to determine which of the proposed sites will be identified as candidate sites. The Alliance will also use offerors' responses to these criteria in selecting the final site, after completion of DOE's NEPA process (the Alliance also reserves the right, at its sole discretion, to request a Best and Final Offer from offerors with sites on the Acceptable Site List provided by DOE after completion of the NEPA process). **Information provided in response to this part should not exceed 20 pages, not including supporting documentation.**

Cost

Sites offered at no or nominal cost to the Alliance will be preferred over sites that require the Alliance to pay prevailing market prices. Offerors must specify the cost to the Alliance for ownership or lease of the proposed power plant site.

In addition, proposals that reduce the financial burden of the project proponents will be preferred. Offerors should identify any financial assistance, cost-share, or in-kind support offered in support of the proposal. The amount of financial support may have a significant impact on selection of the final, preferred site.

Availability and Quality of Existing Plant and Target Formation Characterization Data

Sites that are better characterized are preferred due to the inherently lower risk in siting the FutureGen facility at a well-characterized site. Offerors must identify and submit any environmental assessments; EISs; Phase I or II assessments; biological, cultural, floodplain, or wetland assessments; or other relevant site-specific analyses generated with respect to the proposed power plant site; associated new transmission line, transportation, or pipeline corridors; or surface area above the proposed target formation(s) prepared within the last five years.

Land Ownership

Accessibility to or ownership of land for the proposed power plant site, supporting infrastructure, and target formation, and the timing and cost for such access, are critical to

project success. Offerors who are able to demonstrate the highest degree of timely land use availability will be preferred. Offerors must provide evidence of current ownership or the willingness of current landowners to sell, lease, grant access to, or allow right-of-way onto their property and at what cost (e.g. at, above, or below market value; or at no cost) to the Alliance.

Residences or Sensitive Receptors above Target Formation

It is preferable to minimize the potential for off-normal events to impact residences or other sensitive receptors (e.g., hospitals, schools, or nursing homes) above the proposed target formation(s). Proposed target formations that involve the fewest residences and/or sensitive receptors are desired. Offerors must identify the number of residences and/or sensitive receptors above the proposed target formation(s). Offerors must also identify the number and type (federal, state, local government, or private) of landowners above the proposed target formation, including the projected migration plume for 50 MMT of CO_2.

Waste Recycling and Disposal

Sustained operation of a power plant requires the availability of on-site disposal of solid wastes in order to minimize potential disruptions to operations from factors external to the facility. FutureGen will demonstrate technologies to address issues related to the recycling of byproducts associated with coal gasification processes through scientific research, development, and field testing. The amount and types of solid wastes will depend on the design details of the power plant and the fuel used, which have not yet been finalized. Although waste products will be recycled to the extent practicable, there will be residual quantities of wastes that will require disposal. Offerors must discuss the extent to which wastes can be disposed of on-site and/or the availability of off-site disposal or recycling. This discussion must include the applicable permitting requirements for disposal and recycling at the proposed power plant site. For those wastes that cannot be recycled, sites that can demonstrate the availability of onsite disposal of solid wastes will be preferred.

Clean Air Act Compliance

As envisioned, FutureGen will be a near zero-emission plant during normal operations. However, some criteria air emissions will be released during construction, startup and routine operations, and could be released under upset conditions. Offerors must discuss air quality considerations relative to Clean Air Act requirements in the region of the proposed site. In particular, discuss the Prevention of Significant Deterioration increment that would be available for each criteria air pollutant and how the proposed site will meet the pre-construction air monitoring requirements (40 CFR § 52.21(m)). The Alliance will

prefer sites where necessary Clean Air Act and other regional permits can be readily obtained.

Expedited Permitting

Permitting requirements are key risks to the project schedule and cost. The ability to expedite the various permitting processes is highly desirable to the Alliance. Offerors must identify all necessary federal, state, and local permits and approvals that may be required for the proposed project, the time required for each individual permit or approval, and the collective timeframe required for acquisition of all permits and approvals. Any applicable state environmental review processes must also be addressed. Evidence of successfully expedited permitting for similar projects will be viewed favorably.

Transmission Interconnection

The transmission line that is proposed for grid connectivity must have sufficient capacity and system reliability to accommodate the FutureGen plant's electricity output. To facilitate the Alliance's evaluation of these issues, offerors must describe the status of the interconnection arrangements of the transmission grid with the generating facility currently providing power and energy across the transmission line proposed for grid connectivity. Offerors must specify if the interconnection agreement has been completed, or the status of the interconnection agreement if not completed. Offerors must identify all transmission providers that the Alliance will need to work with for interconnections that do not have an executed interconnection agreement. Offerors must describe the process, plan, and schedule the Alliance would use to obtain interconnection with the applicable transmission provider(s). If an interconnection agreement is already in place, offerors must provide a copy of such interconnection agreement. The Alliance will prefer sites for which documentation is provided that confirms grid stability with the addition of 275-MW to the grid.

Background CO_2 Data

Background levels of CO_2 and the fluctuations in the background on a daily, weekly, monthly, and yearly basis will affect the atmospheric and soil monitoring program for CO_2 over the proposed target formation. Offerors should provide supporting evidence of baseline CO_2 levels in or in close proximity to the area above proposed target formation. These data should be supplemented with additional background CO_2 data from local or regional data sources outside of the immediate area of the target formation, if the offeror believes these data relevant for comparison with the background CO_2 levels. The Alliance will prefer sites where there is documentation regarding background levels of CO_2.

Power Sales

One key revenue stream for the facility is the sale of the power generated. Electricity costs from the FutureGen plant are uncertain and will vary based on the H_2-to-electricity production ratio, the type and cost of fuel, other operational costs from carbon capture equipment operation, and other considerations. Costs could range up to $70 per megawatt-hour during some testing periods, with lower costs possible. However, the actual cost cannot be established at this time. Expected availability during the initial operation phase is assumed to be 50 percent, although the Alliance cannot guarantee on-stream availability.

A commitment by a state or other governmental entity, or a creditworthy organization, to commit to purchase the power output of the FutureGen facility at actual production cost without regard to market prices and without damages for failure to deliver the power is highly desirable to the Alliance. A binding commitment will be viewed much more favorably than a letter of intent. This criterion will be given strong consideration in the evaluation of the proposals.

Market for H_2

The FutureGen facility will produce H_2 in addition to electricity. Sites that demonstrate existing nearby uses or an existing market for H_2 in the region will be preferred. Offerors must identify any regional markets for H_2 and their distance from the proposed power plant site.

CO_2 Title and Indemnification

The offeror should discuss the extent to which it can or is willing to take title to the injected CO_2 and/or indemnify or otherwise protect the FutureGen Industrial Alliance and its members from any potential liability associated with the CO_2. Offerors may discuss other alternatives such as a state-law mandated cap on liability, use of a state-instituted insurance program, or use of a state-mediated bonding program similar to that used for the installation of an underground gas storage field or well storage subject to the UIC program or mine reclamation.

Other Considerations

At their discretion, offerors may provide additional information not specifically requested by this RFP to demonstrate the suitability and advantages of the offered site for the proposed FutureGen facility. Any additional information will be counted toward the 20-page limit for responses to these best value assessment criteria.

4. Format for Response and Evaluation Methodology

4.1. Format for Responses

Offerors are strongly urged to read the RFP carefully and adhere to the page limits specified by the Alliance. **The one-page response to each criterion (e.g., Criterion 1.1.1, 1.1.2, etc.) should be free-standing and capable of independent evaluation, without referring to the supporting documentation for the requested information.** Offerors are also strongly urged to provide specific evidence where requested by the Alliance. While the Alliance will consider all submitted evidence carefully, it reserves the right to ask for clarification or reject any alternative evidence provided with the response to this RFP. Furthermore, the Alliance reserves the right to investigate and reject any evidence or information submitted in support of a site. A proposal containing information known to be false by the offeror will be rejected.

Proposals must be clearly and concisely written, indexed, and logically assembled, per the outline shown below. All text shall be typed, single-spaced, using 12-point font, 1-inch margins, and unreduced 8½-inch by 11-inch pages. Illustrations, maps, and charts shall be legible with all text in legible font. All pages must be appropriately identified with page numbers, identity of the offeror, and date. Data and information submitted must be identified and appropriately referenced in the text of the proposal. The proposal must follow the sections and section number designations presented in this solicitation. Pages in excess of the page limitation will not be considered for evaluation. No material may be incorporated in any proposal by reference as a means to circumvent the page limitation.

The proposal must follow the following format:

- Cover letter that explicitly identifies the offeror, provides necessary contact information, and is signed by a person authorized to contractually bind the offeror.
- Summary (10 pages or less)
- The next five parts must use the criterion numbering scheme used in this RFP:
  Part 1 – Response to Power Plant Qualifying Criteria
  Part 2 – Response to Geologic Storage Qualifying Criteria
  Part 3 – Response to Power Plant Scoring Criteria
  Part 4 – Response to Geologic Storage Scoring Criteria
  Part 5 – Response to Best Value Assessment Criteria
- Supporting documentation for the proposal, clearly indexed against the appropriate criterion.

4.2. Evaluation Methodology

The overall site selection process is described in Section 1.3 of this RFP and is depicted in Figure 1-1.

The first step in the evaluation of proposals will be to check for compliance with the qualifying criteria. Proposals that do not contain sufficient evidence against the qualifying criteria will not be evaluated further.

Those proposals that meet the qualifying criteria will be evaluated against the scoring criteria. Each response will receive a quantitative score against each scoring criterion. Three factors will determine the evaluation: the response provided by the offeror against each criterion, the quality of the evidence or data upon which the response was based, and the importance of each individual criterion to the overall project.

At the conclusion of the evaluation process, all qualifying proposals will be ranked. The Candidate Site List will consist of those sites that, based on the qualifying, scoring, and best value criteria, are clearly superior as compared to the rest of the sites proposed in response to this RFP. Giving consideration to the Candidate Site List, DOE will determine the reasonable site alternatives to be addressed in the EIS. As part of the NEPA process, the Alliance will require the assistance of the offerors in preparing the EIV for each site. The information needed for each site's EIV will be extensive and must be provided at the offeror's expense. Offerors should expect to spend between $100,000 and $200,000 to prepare the EIV for a site. However, the actual cost will depend on the level of information required by DOE to fulfill its NEPA obligations and the quality and quantity of information readily available, among other factors.

Appendix A—Proposed List of Terms and Conditions

The FutureGen Industrial Alliance, Inc. intends to enter into a contract with the successful offeror to acquire property for the proposed FutureGen facility. "Acquire" means transfer of ownership and control of the property pursuant to a purchase and sale agreement, deed, long-term (99-year) lease, purchase option exercisable by the Alliance, or similar instrument (each a "Site Agreement"), in all cases free and clear of all encumbrances. By submitting a response to the FutureGen Industrial Alliance Request for Proposal (RFP), the offeror agrees to the acceptance of the following terms and conditions, unless requests for additions or exceptions are made. Requests for additions or exceptions to the terms and conditions must be submitted to the FutureGen Industrial Alliance with the offeror's proposal and must be accompanied by an explanation of why the exception is being sought and what specific effect it would have on the offeror's ability to transfer the property or its use to the FutureGen Industrial Alliance. The FutureGen Industrial Alliance reserves the right to address non-material requests for exceptions with the successful offeror during contract negotiation. The FutureGen Industrial Alliance will make any final determination of changes to the terms and conditions and/or contract. Any additional terms and conditions not identified in the offeror's proposal will not be considered in the future. To the extent the offeror uses State laws to support their proposal, references to State laws must include the specific clauses being references versus broad brush statements about the laws. The contract will include customary and reasonable terms and conditions consistent with offeror's proposal, and will also specifically include provisions that address the following:

COMPLIANCE WITH LAWS: The offeror must agree to comply fully with all applicable federal, state, or local laws, rules, and regulations with respect to the transfer of the interest in the property.

EXCLUSIVE USE: The FutureGen Industrial Alliance shall have exclusive use of the offered property in perpetuity (for a transfer of ownership or sale) or for the term of the contract (for a long-term lease), including all necessary surface and subsurface mineral rights and water rights. The offeror will not interfere with the FutureGen Industrial Alliance's use of the property in accordance with the Site Agreement. The FutureGen Industrial Alliance will use the offered property only for the construction, operation, and management of the FutureGen project and related purposes. The FutureGen Industrial Alliance will have no obligation to invite the participation by the offeror in the development, construction, operation, or management of the FutureGen and related facilities.

FORCE MAJEURE: Except for obligations to make any payment due the other party, neither party shall be responsible for failure to fulfill its obligations due to causes that are not reasonably foreseeable and beyond its reasonable control, including without limitation, acts or omissions of government or military authority, acts of God, materials shortages, transportation delays, fires, floods, labor disturbances, riots, wars, terrorist acts, or any other causes, directly or indirectly beyond the reasonable control of the non-performing party, so long as such party is using its best efforts to remedy such failure or delays. However, in the event of unreasonable delays in performance by the offeror due to a force majeure event, the Alliance may terminate the bid or negotiation process without liability to any party.

GOVERNING LAW AND ARBITRATION: The laws of the state where the FutureGen facility would be located will govern the Site Agreement, without reference to conflict-of-laws principles. Any disputes under the Site Agreement will be subject to arbitration that will occur in accordance with the Commercial Arbitration Rules of the American Arbitration Association.

HAZARDOUS CONDITIONS: The offeror's proposal must disclose all hazardous substances known by the offeror to be present on the property. The offeror will represent and warrant the accuracy of such disclosures in the Site Agreement. The Alliance reserves the right to conduct an environmental assessment of the property prior to awarding the project to the offeror or entering into any Site Agreement with the offeror.

INDEMNITY: The offeror will indemnify the FutureGen Industrial Alliance and its members against all losses, claims, etc., for personal injury or property damage arising from or out of the offeror's negligent acts or omissions or any breach by the offeror of its obligations under the Site Agreement, except to the extent caused by the negligence of the FutureGen Industrial Alliance or by a breach of the Site Agreement by the FutureGen Industrial Alliance. Neither party to the Site Agreement will be liable to the other for indirect, special, or consequential damages. The offeror agrees to take title to the injected CO_2 and indemnify the FutureGen Industrial Alliance and its members from any potential liability associated with the CO_2, unless prohibited by law.

RELATIONSHIP OF PARTIES: The offeror is an independent party. Nothing shall imply a relationship of employment, agency, association of persons, partnership, or joint venture. The offeror shall have no authority to commit the FutureGen Industrial Alliance to any third party.

SEPARABILITY CLAUSE: A declaration by any court, or any other binding legal source, that any provision of the Site Agreement is illegal and void shall not affect the

legality and enforceability of any other provision of the Site Agreement, unless the provisions are mutually dependent.

TAXES: The offeror is liable for and must pay all taxes and fees of any kind or nature levied on or in connection with the acquisition of the property by the FutureGen Industrial Alliance, unless prohibited by law. The offeror shall indemnify the FutureGen Industrial Alliance against a failure to pay fees or taxes in connection with the acquisition of the property by the FutureGen Industrial Alliance, unless prohibited by law.

TERMINATION OF CONTRACT: If the offeror fails to cure any breach or other violation of any term of this Site Agreement within thirty (30) days after receipt of notice from the FutureGen Industrial Alliance, or under circumstances where the breach or other violation cannot reasonably be cured within a thirty (30)-day period, fails to begin curing such breach or violation within the thirty (30)-day period, or, after commencement of curative action, fails to continue diligently to cure such breach or violation until finally cured, the FutureGen Industrial Alliance may, in its discretion, terminate this Site Agreement and/or may bring an action at law or in equity in a court of competent jurisdiction to enforce the terms of this Site Agreement. The FutureGen Industrial Alliance's remedies shall be cumulative. All costs incurred by the FutureGen Industrial Alliance in enforcing the terms of this Site Agreement against the offeror, including, without limitation, costs and expenses of lawsuit (including appeals) and reasonable attorneys' fees, shall be borne by the offeror, and the FutureGen Industrial Alliance shall be entitled to recover them in any action brought to enforce this Site Agreement.

U.S. FUNDS: All prices and payments must be in U.S. dollars.

VALID TITLE: The offeror shall have valid title to the property and full authority to enter into a Site Agreement with the Alliance. The offeror will provide corresponding representations and warranties in the Site Agreement.

WARRANTIES: The offeror warrants that property offered will conform to the specifications requested in the RFP, and be fit and sufficient for the purpose intended.

Appendix B—Example Calculation for Injected CO_2 Plume Extent

B.1 Introduction

Spreadsheet calculations are presented (see accompanying Excel spreadsheets) to estimate the spatial extent of an injected CO_2 plume in a subsurface formation or formations. The amount of injected CO_2 is fixed at 50 million metric tons (MMT). This calculation represents a highly simplified geological model of a target formation, but does provide a useful bounding estimate of plume extent given anticipated constraints on site specific geological data available to each offeror. While detailed target formation simulations are neither desired nor encouraged by the Alliance, offerors are free to conduct their own calculations of plume extent, provided the input data used and calculation details are provided to the Alliance in the offeror's proposal. **These calculations must be submitted with the offeror's proposal.**

B.2 Input Parameters

There are six input parameters that must be provided by the offeror for each formation. These input parameters are shown in the first worksheet tab named "User Input". The spreadsheet is set up for two formations, each accepting a portion of the injected CO_2, and can be modified for injection into more formations.

B.2.1 Formation Depth

This input parameter is the average depth of the geologic formation.

B.2.2 Formation Thickness

This input parameter is the average thickness of the geologic formation in meters. If the target formation has known zones of high permeability interlayered with low-permeability zones, the offeror should use the net thickness of high-permeability zones as the average formation thickness in this calculation.

B.2.3 Effective Porosity

This input parameter is an average value of the volume of connected pores in a unit volume of the target formation. If the offeror is using the net thickness of high-

permeability zones in Section B.2.2, the average effective porosity of the higher permeability zones should be used here.

B.2.4 Temperature

This input parameter is the average temperature of the target formation, in degrees Celsius.

B.2.5 Dissolved NaCl

This input parameter is the salinity of interstitial pore water in the target formation, expressed as molality (moles of NaCl per kilogram of water).

B.2.6 Percentage of Injection

This input parameter determines how the injected CO_2 will be divided between two target formations. In the example given, 70% is allocated to Formation 1, and the remaining 30% is allocated to Formation 2. The spreadsheet may be modified to account for more than two formations.

B.3 Calculated Parameters

All calculated parameters are summarized in the first worksheet tab named "User Input". These parameters are calculated using tables and formulas in the worksheets named "Interpolate", "Temperature", "Density", "Fugacity Coefficient", "Henry's Constant", "Water Density" and "Brine Density". The formulas for these worksheets were adapted from those used in the STOMP simulator (BACON et al., 2004).

B.3.1 Formation Pressure

The formation pressure is estimated assuming hydrostatic conditions, using

$$P = \frac{dP}{dz}(z)$$

Where z is the average depth of the formation (see Section B.2.1), and *dP/dz* is the pressure gradient with depth. The hydrostatic pressure gradient for fresh water was used, which is 0.433 psi/ft (9794 Pa/m).

B.3.2 CO_2 Density

The density of supercritical CO_2 is calculated as a function of temperature and pressure. The CO_2 density table is based on an equation of state for supercritical CO_2 (SPAN and WAGNER, 1996). The worksheet named "Interpolate" performs bilinear interpolation of the density table contained in worksheets named "Temperature" and "Density."

B.3.3 CO_2 Fugacity Coefficient

The fugacity coefficient of CO_2 is calculated as a function of temperature and pressure. The CO_2 fugacity coefficient table is based on an equation of state for supercritical CO_2 (SPAN and WAGNER, 1996). The worksheet named "Interpolate" performs bilinear interpolation of the fugacity coefficient table contained in worksheets named "Temperature" and "Fugacity Coefficient."

B.3.4 CO_2 Henry's Constant

The Henry's Constant for CO_2 is calculated as a function of temperature and salinity (BATTISTELLI et al., 1997) in the worksheet named "Henry's Constant." First, the Henry's Constant in pure water is calculated as an empirical function of temperature, and then an empirical correction factor is applied based on the amount of dissolved NaCl.

B.3.5 CO_2 Aqueous Mass Fraction

The CO_2 aqueous mass fraction is calculated using Henry's Law (REID et al., 1987)

$$\omega_{water}^{CO_2} = \frac{f^{CO_2} P}{H_{CO_2}} \frac{M_{CO_2}}{M_{water}}$$

where f^{CO_2} is the CO_2 fugacity coefficient, P is the pressure, H_{CO_2} is the Henry's Constant for CO_2, M_{CO_2} is the molecular weight of CO_2, and M_{water} is the molecular weight of water.

B.3.6 Aqueous Density

The aqueous density of pure water is computed as a function of temperature and pressure using the steam table formulations (MEYER et al., 1993) in the worksheet named "Aqueous Density." The aqueous density is corrected for salt content in the worksheet named "Brine Density" (HAAS JR., 1976).

B.3.7 Water Content

This parameter is an average value of the volume of water per unit volume of the formation. Here it has been assumed that 30% of the interstitial pore water will be displaced by injected CO_2.

B.4 Fixed Parameter

B.4.1 Mass of Injected CO_2

The total amount of CO_2 that must be injected is fixed at 50 MMT. This amount is divided between the formations according to the percentage given in Section B.2.6.

B.5 Results

B.5.1 Supercritical CO_2 Capacity

The capacity of the formation to hold supercritical CO_2 as a separate phase is calculated using

$$C_g = \rho_{CO_2}\left(\phi_e - \theta_w\right)$$

where ρ_{CO_2} is the density of CO_2 (see Section B.3.2), ϕ_e is the effective porosity of the formation (see Section B.2.3), and θ_w is the water content of the formation (see Section B.3.7).

B.5.2 Dissolved CO_2 Capacity

The capacity of the formation to hold CO_2 dissolved in interstitial pore water is calculated using

$$C_\ell = \omega_{water}^{CO_2}\rho_w\theta_w$$

where $\omega_{water}^{CO_2}$ is the mass fraction of CO_2 in water (see Section B.3.5), ρ_w is the aqueous density (see Section B.3.6), and θ_w is the water content of the formation (see Section B.3.7).

B.5.3 CO_2 Plume Areal Extent

This is an estimate of the horizontal area of the plume using

$$A = \frac{m_{CO_2}}{\left(C_g + C_\ell\right)}$$

where m_{CO_2} is the mass of injected CO_2 (see Section B.4.1).

B.5.4 CO_2 Plume Volume

This is an estimate of the volumetric extent of the plume, assuming uniform geologic properties, hydraulic conditions, and distribution of CO_2.

$$V = AL$$

Where A is the horizontal area of the plume (see Section B.5.3), and L is the thickness of the formation (see Section B.2.2).

B.6 References

Bacon, D. H., M. D. White, and B. P. McGrail. 2004. *Subsurface Transport Over Reactive Multiphases (STORM): A Parallel, Coupled, Nonisothermal Multiphase Flow, Reactive Transport, and Porous Medium Alteration Simulator, Version 3.0.* PNNL-14783, Pacific Northwest National Laboratory, Richland, Washington.

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