

Plan of Development Outline

Carbon Dioxide Geologic Sequestration Exploration and Site Characterization Permit

1. What objectives and criteria will be used to evaluate the success or failure of proposed CO₂ GS exploration and site characterization studies?
2. What are the applicant's purpose and need for the proposed CO₂ GS exploration and site characterization studies? (This is not the same as the Bureau of Land Management (BLM) purpose and need – BLM NEPA Handbook, H-1790-1, Section 6.3.)
3. What is the financial and technical capability of the applicant to complete proposed CO₂ GS exploration and site characterization studies (documentation must be provided)?
4. What is the target storage formation(s) proposed for study? (Provide any initial maps, cross sections, analyses, etc. demonstrating potential for a suitable geologic system.)
5. What is the primary sealing unit/formation proposed for study? (Provide any initial maps, cross sections, analyses, etc. demonstrating potential for a suitable geologic system.)
6. What is the proposed source(s), volume, rate of delivery, and target injection rate of CO₂?
7. Who are the owners of the surface and subsurface estate and of all jurisdictions/ownerships encompassed within the proposed CO₂ GS exploration and site characterization permit area?
8. What potential proximity issues have been identified in the proposed permit area (e.g., protected/sensitive areas, population centers, existing resource development, tribal interests, access issues)?
9. What existing uses have been identified in the proposed permit area (e.g., mining claim locations, mineral leases, recreation, grazing, rights-of-way)?
10. Are there any other existing compatible/non-compatible uses that have been identified in the proposed permit area that may potentially conflict with proposed CO₂ GS exploration and site characterization studies?
11. What are the current and proposed state, regional, and Federal regulatory and permitting requirements applicable to CO₂ GS exploration and site characterization studies?
12. Who are the initial stakeholders that have been identified?
13. What public outreach efforts could potentially be necessary to support proposed CO₂ GS exploration and site characterization studies?
14. What are the anticipated timelines for all phases of proposed CO₂ GS exploration and site characterization studies (e.g., state and Federal permitting, initial site characterization, well plugging, reclamation of disturbed lands)?

15. What personnel, operator certification, equipment, and funding are expected to be necessary to complete proposed CO₂ GS exploration and site characterization studies?
16. What best management practices or measures are proposed to provide for safe CO₂ GS exploration and site characterization operations, public health/safety, and protection of resources, groundwater, and other environmental components including containment and disposal of all waste materials?
17. How will proposed CO₂ GS exploration and site characterization operations/activities be monitored to ensure compliance with all applicable requirements/regulations?

18. Proposed Location

- a. What is the legal land description of the area proposed for CO₂ GS exploration and site characterization studies (proposed permit area)? (Legal land description must be based upon the public land rectangular surveys and examples in *Specifications for Descriptions of Tracts of Land*, (1979), (<http://www.blm.gov/wo/st/en/prog/more/cadastralsurvey/tools.html>))?

What is the legal land description of the location of all proposed surface facilities including access roads/routes, drill pads, wells, monitoring equipment/storage areas, etc., and any facilities proposed outside of the permit area boundary? (Provide a location map depicting the proposed CO₂ GS exploration and site characterization area proposed for further study (including all of the surface area above the geologic formation being studied) and the location of all proposed surface facilities including drill pads, wells, access roads/routes, etc.)

19. Acreage

- a. What is the total acreage of the proposed CO₂ GS exploration and site characterization area (including all of the surface area above the geologic formation being studied)?
- b. What is the total acreage of the potential surface area that may be disturbed by facilities, access roads/routes, and components, etc.?
- c. What is the total acreage of each jurisdiction/ownership within the proposed CO₂ exploration and site characterization permit area?

20. Proposed Surface Use Plan

- a. What are the general dimensions of all proposed access roads/routes, drill pads, and all other surface facilities?
- b. What are the proposed construction methods and materials to be used, and where will materials such as road gravel be obtained? Is the source on public land?

- c. What operations/activities are necessary to perform the required studies and obtain documentation as required by applicable state and Federal regulations and would there be surface disturbance and/or any other anticipated impacts associated with each operation/activity?
- d. What operations/activities are necessary to identify and characterize additional (secondary) confinement zones, if required, and what potential surface disturbance and other impacts would be associated with each activity?

21. Proposed Drilling Plan

- a. What are the number, type (i.e., stratigraphic, injection, monitoring), and location of test wells proposed to be drilled?
- b. What is the proposed drilling plan for each proposed well (e.g., design, construction, logging, sampling, testing, operating, injection, monitoring, reporting, plugging, closure, and abandonment in compliance with current and anticipated state, regional, and Federal regulations)?
- c. For each proposed injection well:
 - i. What substance is proposed to be injected?
 - ii. At what depth is injection proposed?
 - iii. What is the water quality/salinity in the injection interval expected to be?
 - iv. What are the anticipated effects and potential impacts?

22. Proposed Reclamation Plan

- a. What measures are proposed for soil stabilization and reclamation of disturbed lands upon completion of CO₂ GS exploration and site characterization operations/activities (e.g., configuration of reshaped topography, seeding, or other steps to reestablish vegetation, weed control, and practices necessary to reclaim all disturbed areas and temporary access roads)?
- b. Provide a Reclamation Cost Estimate (RCE) for proposed CO₂ GS exploration and site characterization operations/activities in accordance with guidance provided in IM 2009-153, dated June 19, 2009. The RCE must 1) include the equipment type, time, and rate needed to perform reclamation tasks such as mobilization, grading, topsoil placement, seeding, and structure removal for each component of the proposed CO₂ GS exploration and site characterization studies; 2) be based on the assumption that the BLM would hire a third-party contractor and must include contract administration and overhead costs; and 3) include appropriate costs for contractor profit and insurance.

23. Links to information potentially applicable to CO₂ GS exploration and site characterization land use authorizations:

- a. *BLM National Environmental Policy Act Handbook*, H-1790-1
http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.24487.File.dat/h1790-1-2008-1.pdf
- b. EPA Federal Requirements Under the Underground Injection Control Program for Carbon Dioxide Geologic Sequestration Wells
<http://www.gpo.gov/fdsys/pkg/FR-2010-12-10/pdf/2010-29954.pdf>
- c. BLM Best Management Practices
http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices.html
- d. 2010 Carbon Sequestration Atlas of the United States and Canada – Third Edition
http://www.netl.doe.gov/technologies/carbon_seq/refshelf/atlasIII/
- e. USGS Carbon Sequestration
http://rmgsc.cr.usgs.gov/carbon_seq/
- f. DOE Carbon Sequestration
<http://www.energy.gov/sciencetech/carbonsequestration.htm>