TESTING AND MONITORING PLAN OVERVIEW
40 CFR 146.90

Brown Pelican CO_2 Sequestration Project

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1.0 Facility Information

Facility name: Brown Pelican CO_2 Sequestration Project
Brown Pelican CCS 1 Well

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Well location: [redacted]

This Testing and Monitoring Plan describes how Oxy Low Carbon Ventures, LLC (OLCV), will monitor the Brown Pelican CO_2 Sequestration Project site pursuant to 40 CFR 146.90. In addition to demonstrating that the well is operating as planned, the carbon dioxide (CO_2) plume and pressure front are moving as predicted, and that there is no endangerment to underground sources of drinking water (USDWs), the monitoring data will be used to validate and adjust the geological

models used to predict the distribution of the CO_2 within the storage zone to support Area of Review (AoR) reevaluations and a non-endangerment demonstration.

Results of the testing and monitoring activities described below may trigger action according to the Emergency and Remedial Response Plan.

2.0 Overall Strategy and Approach for Testing and Monitoring

The monitoring network is designed to detect unforeseen CO_2 and/or brine leakage out of the injection zone that could endanger the USDW, migrate to a different stratum, or create a risk for the people or environment. The monitoring program is tailored to track the migration of the CO_2 plume and development of the pressure front to validate the simulation models and to be able to delineate the AoR effectively. There are several components that are integrated into the master plan for monitoring, which are classified in the following categories:

1. Carbon Dioxide Stream Analysis
2. Continuous Recording of Operational Parameters
3. Corrosion Monitoring and Leak Detection
4. Above Confining Zone Monitoring
5. External Mechanical Integrity Testing
6. Pressure Fall-Off Testing
7. Carbon Dioxide Plume and Pressure Front Tracking

The tools and techniques proposed to monitor the surface and downhole operating conditions of the wells along with the quality of the CO_2 being injected are included in the project Testing and Monitoring Plan document of the permit.

2.1 Quality Assurance Procedures

A quality assurance and surveillance plan (QASP) for testing and monitoring activities, required pursuant to 146.90(k), is provided as a separate document in this permit.

2.2 Reporting Procedures

OLCV will report the results of all testing and monitoring activities to the EPA in compliance with the requirements under 40 CFR 146.91.

3.0 Carbon Dioxide Stream Analysis [40 CFR 146.90(a)]

OLCV will analyze the CO_2 stream during the operation period to yield data representative of its chemical and physical characteristics and to meet the requirements of 40 CFR 146.90(a).

4.0 Continuous Recording of Operational Parameters [40 CFR 146.88(e)(1), 146.89(b) and 146.90(b)]

OLCV will install and use continuous recording devices to monitor injection pressure, annular pressure, rate, and volume along with the temperature of the CO_2 stream, as required by 40 CFR 146.88(e)(1), 146.89(b), and 146.90(b).

5.0 Corrosion Monitoring and Surface Leak Detection

To meet the requirements of 40 CFR 146.90(c), OLCV will monitor well materials during the operation period for loss of mass, thickness, cracking, pitting, and other signs of corrosion to ensure that the well components meet the minimum standards for material strength and performance.

6.0 Above Confining Zone Monitoring

OLCV will monitor ground water quality and geochemical changes above the confining zone, during the operation period to meet the requirements of 40 CFR 146.90(d).

7.0 Internal and External Mechanical Integrity Testing

OLCV will conduct testing periodically during the injection phase to verify mechanical integrity, as required at 146.89(c) and 146.90.

8.0 Pressure Fall-Off Testing

OLCV will perform pressure fall-off tests during the injection phase to meet the requirements of 40 CFR 146.90(f).

9.0 Carbon Dioxide Plume and Pressure Front Tracking

OLCV will conduct early-detection monitoring in the subsurface using direct and indirect methods to track the extent of the carbon dioxide plume and the presence or absence of elevated pressure during the operation period to meet the requirements of 40 CFR 146.90(g).

10.0 Induced Seismicity

A seismometer monitoring network will be deployed to determine the locations, magnitudes, and focal mechanisms of any injection-induced seismic events in case they occur.

11.0 Reporting

The results of all testing and monitoring are to be described in a semi-annual report that will be submitted to the EPA.