ATTACHMENT F - APPENDIX

Quality Assurance and Surveillance Plan

40 CFR 146.90 (k)

Facility Information

Facility name: River Parish Sequestration – RPN 1
RPN-1-INJ

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Well name/location: RPN-1-INJ,[redacted]

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[redacted]

Title and Approval Sheet

This Quality Assurance and Surveillance Plan is approved for use and implementation at the River Parish Sequestration Project, operated by River Parish Sequestration, LLC. The signatures below denote the approval of this document and intent to abide by the procedures outlined within it.

Signature Date

Printed Name

Title

Signature Date

Printed Name

Title

Signature Date

Printed Name

Title

Distribution List

The following project participants will receive the completed Quality Assurance and Surveillance Plan and all future updates for the duration of the project.

Contact	**Contact**
Title	Title
Address	Address
City, State, Zip	City, State, Zip
E: email	E: email
T: phone	T: phone

List of Acronyms/Abbreviations

AoR	Area of Review
CO_2	carbon dioxide
DAS	distributed acoustic sensing
DTS	distributed temperature sensing
EPA	Environmental Protection Agency
FID	flame ionization detector
FLIR	forward-looking infrared
GC	gas chromatography
ft	feet
hZ	hertz
LELAP	Louisiana Environmental Laboratory Accreditation Program
mg/L	milligram(s) per liter
MIT	mechanical integrity test
MVA	monitoring, verification, and accounting
NDIR	non-dispersive infrared
PNC	pulse neutron capture
ppb	parts per billion
ppm	part per million
psi	pound(s) per square inch
QA/QC	quality assurance/quality control
QASP	*Quality Assurance and Surveillance Plan*
RPS	River Parish Sequestration
RPSP	River Parish Sequestration Project
SOP	Standard Operating Procedure(s)
TCD	thermal conductivity detector
TDS	total dissolved solids
UIC	underground injection control
µg/L	microgram(s) per liter
USDW	underground source of drinking water
VSP	vertical seismic profile

A. Project Management

A.1 Project/Task Organization

A.1.a Key Individuals and Responsibilities

River Parish Sequestration, LLC, (RPS) will lead the project testing and monitoring activities with participation from several subcontractors. [redacted]

A.1.b Independence from Project Quality Assurance Manager and Data Gathering

Third parties independent and outside of the project management structure will analyze, process, or witness physical samples collected and other data gathered as part of the monitoring, verification, and accounting (MVA) program. RPS will provide a final list of vendors, subcontractors, and independent testing labs with access to the monitoring data generated through this project prior to requesting authorization to commence injection.

A.1.c QA Project Plan Responsibility

RPS will be responsible for maintaining and distributing the official, approved *Quality Assurance and Surveillance Plan* (QASP). RPS will periodically review this QASP and consult with the United States Environmental Protection Agency (EPA) and Louisiana Department of Natural Resources (LDNR) as changes are warranted.

[redacted]

A.2 Problem Definition/Background

A.2.a Reasoning

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted] The project is located in one of the most concentrated clusters of existing industrial emissions (CO_2 per square mile) in America. [redacted]

[redacted]

A.2.c Regulatory Information, Applicable Criteria, Action Limits

According to the Class VI rule, owners or operators of Class VI wells are responsible for assuring the following throughout a project's duration: that the injection well maintains its mechanical integrity; that USDWs are not at risk; and that fluid migration and the extent of pressure elevation are compliant with the limits outlined in the permit application. Monitoring throughout the project includes mechanical integrity tests (MITs), groundwater quality monitoring, injection well testing during operation, and tracking of the CO_2 plume and the associated pressure front. This QASP describes both the measurements that will be recorded as well as the accompanying procedures that will be followed to ensure the quality of the data is such that it can be confidently used to make decisions throughout the project.

A.3 Project/Task Description.

A.3.a Summary of Work to be Performed

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

RST: residual saturation tool

A.3.b Geographic Locations

[redacted]

A.4 Quality Objectives and Criteria

[redacted]

[1] Note coordinates based on NAD 27 reference system.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

A.4.b Precision

[redacted]

A.4.c Bias

[redacted]

A.4.d Representativeness

[redacted]

[redacted]

A.4.e Completeness

[redacted]

A.4.f Comparability

[redacted]

A.4.g Method Sensitivity

Table A.4-9 through **Table A.4-11** provide additional details on gauge specifications and sensitivities.

[redacted]

A.5 Special Training/Certifications

A.5.a Specialized Training and Certifications

[redacted]

[redacted]

A.5.b Training Provider and Responsibility

[redacted]

A.6 Documentation and Records

Each monitoring focus area produces distinct types of data and has distinct data-management needs (input, storage, processing, manipulation, querying, access/output). [redacted]

[redacted]

A.6.a Report Format and Package Information

RPS will provide a semi-annual report for EPA and LDNR containing all required project data as specified by the UIC Class VI permit. Data will be provided in electronic or other formats as required by the UIC Program Director and Office of Conservation Commissioner.

A.6.b Other Project Documents, Records, and Electronic Files

Other documents, records, and electronic files will be provided as required by the UIC Program Director and Office of Conservation Commissioner, and may include laboratory QC test results or well logs.

A.6.c Data Storage and Duration

RPS or a designated contractor will maintain the required project data as described in the records plan.

A.6.d QASP Distribution Responsibility

A representative from RPS will be designated as the responsible party for ensuring that all those on the distribution list will receive and maintain the latest copy of the approved QASP.

B. Direct Data Generation and Acquisition

B.1 Sampling Process Design

[redacted]

[redacted]

[redacted]

B.1.a Design Strategy

The overall strategy and approach for testing and monitoring is given in depth in the *Testing and Monitoring Plan*.

Groundwater Monitoring Strategy

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[2] Resource Conservation and Recovery Act. *42 U.S.C. 6901 et seq.* (1976).
[3] Comprehensive Environmental Response, Compensation, and Liability Act. *42 U.S.C. 9601 et seq.* (1980).

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B.2.h Corrective Action, Personnel, and Documentation

Field personnel will be responsible for thoroughly testing equipment, as well as implementing corrective actions on broken or malfunctioning equipment. If corrective action is not possible in the field, then equipment will be sent back to the manufacturer or qualified technician to be repaired, serviced, or replaced. Corrective actions significant enough to affect analytical data will be noted and documented. If defective equipment will cause disruptions to the sampling schedule, revisions will be made and communicated to the UIC Program Director and Office of Conservation Commissioner.

[redacted]

[redacted]

[7] EPA, *Methods for chemical analysis of water and wastes,* US EPA Cincinnati, OH, EP-625-/6-74-003a (1974).
[8] APHA, *Standard methods for the examination of water and wastewater, 21st ed.* American Public Health Association (2005).
[9] Warren Wood, *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents* (1976).
[10] ASTM International, *Standard Guide For Field Preservation of Ground-Water Samples* (2005).

[redacted]

[redacted]

[redacted]

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[11] US EPA Laboratory Services and Applied Sciences Division, *Soil Gas Sampling*, United States, Environmental Protection Agency, (2020).

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

B.4.b Equipment/Instrumentation Needed

Equipment and instrumentation are specified according to the individual analytical methods referenced in **Table A.4-1** through **Table A.4-5**.

[redacted]

[redacted]

B.4.d Analytical Failure

Each laboratory conducting the analyses in **Table A.4-1** through **Table A.4-5** will be responsible for appropriately addressing analytical failure according to their individual SOPs.

B.4.e Sample Disposal

Each laboratory conducting the analyses in **Table A.4-1** through **Table A.4-5** will be responsible for appropriate sample disposal according to their individual SOPs.

B.4.f Laboratory Turnaround

Laboratory turnaround will vary by laboratory.

[redacted]

B.5 Quality Control

B.5.a QC activities

[redacted]

[redacted]

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Determining one or more statistical outliers is essential before statistical evaluation of groundwater. [redacted]

B.6 Instrument/Equipment Testing, Inspection, and Maintenance

[redacted] On-hand supplies will include spare parts that may be needed during field sampling. All testing, inspection, and maintenance of laboratory equipment will be the responsibility of the analytical laboratory per standard practice, method-specific protocol, or other official requirements.

B.7 Instrument/Equipment Calibration and Frequency

B.7.a Calibration and Frequency of Calibration

Table A.4-9 through **Table A.4-11** contain gauge calibration information. Logging tool calibration will be at the discretion of the service company who provides the equipment and will adhere to standard industry practices. Calibration frequency will be determined by standard industry practices. [redacted]

[redacted]

[redacted]

B.7.b Calibration Methodology

Logging tool calibration methodology will adhere to standard industry practices. [redacted]

[redacted]

B.8 Inspection/Acceptance for Supplies and Consumables

B.8.a Supplies, Consumables, and Responsibilities

Supplies and consumables for field and laboratory operations will be procured, inspected, and accepted as required from RPS-approved vendors or the respective subcontractor for the data collection activity. [redacted]

B.9. Indirect Data Measurements

B.9.a Pressure and Temperature Monitoring

B.9.a.1.a Data Sources

[redacted]

[redacted]

B.9.a.3 Acceptance Criteria

Gauges and other equipment used to collect non-direct measurements will be checked periodically and maintained according to manufacturer recommendations for equipment care and operation, to ensure the accuracy of readings as they are incorporated into the model.

B.9.a.4 Resources/Facilities Needed

RPS will subcontract all necessary resources and facilities for the in-zone pressure monitoring.

B.9.a.5 Validity Limits and Operating Conditions

All data incorporated into numerical models will be vetted using procedural checks and balances that are designed to ensure the accuracy of the analysis being conducted.

[redacted]

[redacted]

[redacted]

[redacted]

B.9.b.2 Relevance to Project

Induced seismicity monitoring will be used to monitor for potential seismicity resulting from the CO_2 plume migration and associated reservoir pressure perturbations. Seismicity monitoring and relocation mapping may aid in detection of potential leak points, and inform need for corrective action.

B.9.b.3 Acceptance Criteria

Gauges and other equipment used to collect non-direct measurements will be checked periodically and maintained according to manufacturer recommendations for equipment care and operation, to ensure the accuracy of readings as they are incorporated into the model.

B.9.b.4 Resources/Facilities Needed

RPS will subcontract all necessary resources and facilities for the induced seismicity monitoring.

B.9.b.5 Validity Limits and Operating Conditions

All data incorporated into numerical models will be vetted using procedural checks and balances that are designed to ensure the accuracy of the analysis being conducted.

B.9.c Vertical Seismic Profile

B.9.c.1 Data Sources

[redacted]

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C. Assessment and Oversight

C.1 Assessments and Response Actions

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D. Data Validation and Usability

D.1 Data Review, Verification, and Validation

D.1.a Criteria for Accepting, Rejecting, or Qualifying Data

[redacted]

D.2 Verification and Validation Methods

D.2.a Data Verification and Validation Processes

See Section D.1.a. and Section B.5. For the purposes of determining data consistency, appropriate statistical software will be utilized.

D.2.b Data Verification and Validation Responsibility

[redacted]

D.2.c Issue Resolution Process and Responsibility

[redacted]

D.2.d Checklist, Forms, and Calculations

Checklists and forms will be developed specifically to meet permit requirements.

D.3 Reconciliation with User Requirements

D.3.a Evaluation of Data Uncertainty

[redacted]

D.3.b Data Limitations Reporting

[redacted]

Figures

Figure Index

[redacted]

[redacted]

[redacted]

Ascension, Assumption, and Iberville Parishes
Louisiana

RIVER PARISH

RPS Project	May 2023	Figure A.1.d-1

[redacted]

[redacted]

Ascension, Assumption and Iberville Parishes
Area of Donaldsonville, Louisiana

RIVER PARISH

RPS Project	May 2023	Figure A.3.b-1

[redacted]

Ascension, Assumption, and Iberville Parishes
Louisiana

RIVER PARISH

Figure B.9.b-1

RPS Project	May 2023

[redacted]

Ascension, Assumption, and Iberville Parishes
Louisiana

RIVER PARISH

RPS Project	May 2023	**Figure B.9.b-2**

[redacted]

Ascension, Assumption, and Iberville Parishes
Louisiana

RIVER PARISH

RPS Project	May 2023	Figure B.9.c-1

[redacted]

[redacted]

Ascension, Assumption, and Iberville Parishes
Louisiana

RIVER PARISH

RPS Project	May 2023	Figure B.9.c-2

[redacted]

Ascension, Assumption, and Iberville Parishes
Louisiana

RIVER PARISH

RPS Project	May 2023	Figure B.9.c-3