

Plan revision number: 0

Plan revision date: 11/30/23

PROPOSED PRE-OPERATIONAL FORMATION TESTING PLAN

South Texas Sequestration Project (Kleberg Hub)

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1.0 Facility Information

Facility name: South Texas Sequestration Project (Kleberg Hub)
Well Name: Becerra_CCS_01_01

Facility contact: [REDACTED], Project Manager
5 Greenway Plaza, Suite 110, Houston, TX 77046
[REDACTED]

Well location: Kleberg County, Texas
[REDACTED] (NAD 27)

The testing activities described in this attachment are proposed by 1PointFive Sequestration, LLC (1PointFive) for the Becerra_CCS_01_01 to be located at the South Texas Sequestration Project (Kleberg Hub or Project) and are restricted to the pre-injection phase. Testing and monitoring activities during the injection and post-injection phases are described in the Testing and Monitoring Plan along with other non-well related pre-injection baseline activities, such as geophysical and geochemical monitoring.

1PointFive will construct two (2) new wells as CO₂ injectors, Becerra CCS 01 01 and Becerra_CCS_01_02. The first injector will target storage of CO₂ in the [REDACTED] while the second injector will target injection in the [REDACTED], as detailed in the Injection Well Construction Plan of this application.

1PointFive has drilled two (2) stratigraphic test wells, [REDACTED]. The objective of these two wells is to collect site-based data that includes geophysical logs, rock samples, fluid samples, and formation tests, among others, to complement the existing geological model and numerical simulation model. [REDACTED]
[REDACTED] [REDACTED]

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Additionally, 1PointFive will drill one (1) Above Confining Zone well, [REDACTED] and four (4) Shallow Aquifer monitoring wells.

2.0 Pre-Injection Formation Test Plan – CO₂ Injector Wells (CCS)

The following tests and logs will be run during drilling, casing installation, and completion in the Becerra_CCS_01_01 and Becerra_CCS_01_02 injector wells in accordance with the testing required under 40 CFR 146.87(a), (b), (c), (d), and (e).

The CO₂ injector well testing program includes a combination of advanced logging, sidewall coring, fluid sampling, and formation hydrogeologic testing. This program is complemented with an extensive data acquisition program in the stratigraphic test wells, [REDACTED], as well as the data acquisition planned in the additional monitoring wells.

The pre-operational testing program will measure the depth, fluid salinity, thickness, mineralogy, lithology, porosity, and permeability information of the injection zone, overlying confining zone, and other relevant geologic formations. This data acquisition program will be used to determine conformance with the injection well construction requirements and to establish accurate baseline data for future monitoring activities.

Table POT-1 lists the logging, testing, surveys, and mud log sampling program for the Becerra_CCS_01_01 and Becerra_CCS_01_02 wells to comply with 40 CFR 146.87 (a).

Table POT-1—Logging, testing and surveying plan for CO ₂ Injector wells [(40 CFR 146.87 (a))]		
Method	Interval (ft)	Purpose
Open hole logs, tests and surveys during construction		
[REDACTED] [40 CFR 146.87 (a) (1)]	[REDACTED]	[REDACTED]
[REDACTED] [40 CFR 146.87 (a) (2) (i)]		
[REDACTED] [40 CFR 146.87 (a) (2) (i)]		
[REDACTED] [40 CFR 146.87 (a) (3) (i)]		
[REDACTED] [40 CFR 146.87 (a) (3) (i)]		
[REDACTED] [40 CFR 146.87 (a) (2) (i)]		
[REDACTED] [40 CFR 146.87 (a) (3) (i)]		

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[REDACTED] [40 CFR 146.87 (a)(3) (ii)]	[REDACTED]
[REDACTED] [40 CFR 146.87 (a)(4) (i)]	
[REDACTED] [40 CFR 146.87 (a)(4) (i)]	
[REDACTED] [40 CFR 146.87 (a)(4) (ii)]	
[REDACTED] [40 CFR 146.87 (a)(4) (iv)]	
[REDACTED] [40 CFR 146.87 (a)(4) (iii)]	

The long string section of the Becerra_CCS_01_01 and Becerra_CCS_01_02 wells will be drilled with [REDACTED] for well stability while drilling, logging, and cementing and for optimum hole conditions during the construction of the well. Therefore, it will not be possible to acquire spontaneous potential logs; however, 1PointFive is proposing additional new generation logs to improve reservoir and confining zone characterizations as described in the table above.

1PointFive will not collect full cores while drilling the long string section in Becerra_CCS_01_01 and Becerra_CCS_01_02. Only sidewall cores will be collected, as allowed by 40 CFR 146.87 (b). 1PointFive will also collect water samples in the injection zone as shown in Table POT-2.

As part of the data acquisition program for the Kleberg Hub, 1PointFive will acquire full cores in the [REDACTED] as well as sidewall cores, reservoir pressures, and water samples in both the [REDACTED] stratigraphic test wells as described in detail in the following section.

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Table POT-2—Sidewall cores and water sampling for CO₂ Injector wells (40 CFR 146.87 (b))

Method	Interval (ft)	Samples	Purpose
[Redacted]			

1PointFive will record the fluid temperatures and reservoir pressures obtained from the wireline tool while taking the pressure points and water samples (40 CFR 146.87 (c)). [Redacted]

The project team plans to perform the following analysis in the Sidewall cores collected from Becerra_CCS_01_01:

Table POT-3- Core analysis to be performed in the sidewall cores samples from CO₂ Injector wells.

RSWC Testing
[Redacted]

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1PointFive will send the water samples to a third-party lab for a complete analysis including pH, conductivity, major cations, major anions, trace metals, dissolved gases, density, and TDS, among others. Table POT-4 shows the minimum analytics to be characterized in the downhole water samples (40 CFR 146.87 (d)(3) and 40 CFR 146.87 (c)).

Table POT-4—Analyses and methods for water samples testing.

Parameter	Analytical Method
[Redacted Table Content]	

The static fluid level of the injection zones will be determined after the completion of the well during the step rate test, injectivity tests, and fall off tests (40 CFR 146.87 (c)). [Redacted]

[Redacted]

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To comply with 40 CFR 146.87 (d), the proposed data acquisition program in the CO₂ injector wells includes formation testing/logging, rotary sidewall core sampling and analyses, wireline mini-frac (Table POT-1), and hydrogeologic testing to determine the physical and chemical characteristics of the injection and confining zones. This program will complement the data being acquired in 2023 from the stratigraphic wells during the initial site characterization and add baseline data prior to commencing CO₂ injection.

The [REDACTED] stratigraphic well includes the execution of wireline minifrac test in the [REDACTED] confining zone and leak off tests in the injection zones of the [REDACTED], as well as the [REDACTED], which will allow to calibration of the geomechanics model to determine the frac gradient in the confining zones and injection targets on the site. 1PointFive will perform step rate and fall off tests in both target injection zones of the [REDACTED] to calibrate permeability and reservoir boundaries in the model after acquired data has been fully evaluated and interpreted.

Upon completion and prior to injection in the Becerra_CCS_01_01 and Becerra CCS 01 02 wells, 1PointFive will conduct the tests described in Table POT-5 to verify [REDACTED]

[REDACTED] (40 CFR 146.87 (d) (1) and 40 CFR 146.87 (e)).

Table POT-5 [REDACTED]

Method	Comments
[REDACTED]	

3.0 Pre-Injection Formation Test Plan – In-Zone Monitoring Wells (IZM)

[REDACTED] were drilled by 1PointFive in 2023, initially as stratigraphic wells, to be converted later to In Zone monitoring wells. Table POT-6 and Table POT-7 show the logging, testing, surveys, and mud log sampling programs for these wells.

Pursuant to 40 C.F.R. §2.213, please contact Renee Willis, LCV Coordinator, Oxy Low Carbon Ventures, 5 Greenway Plaza, Houston, TX 77046, (713) 215-7632 if the EPA receives a request for disclosure of or seeks to disclose the data claimed to be confidential.

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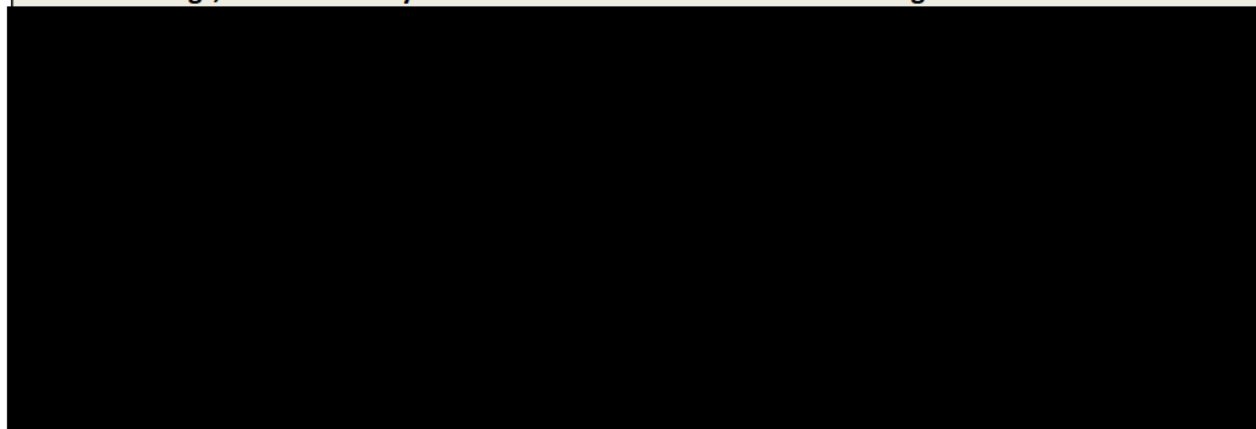
Table POT-6—Logging, testing and surveying for

[illegible]

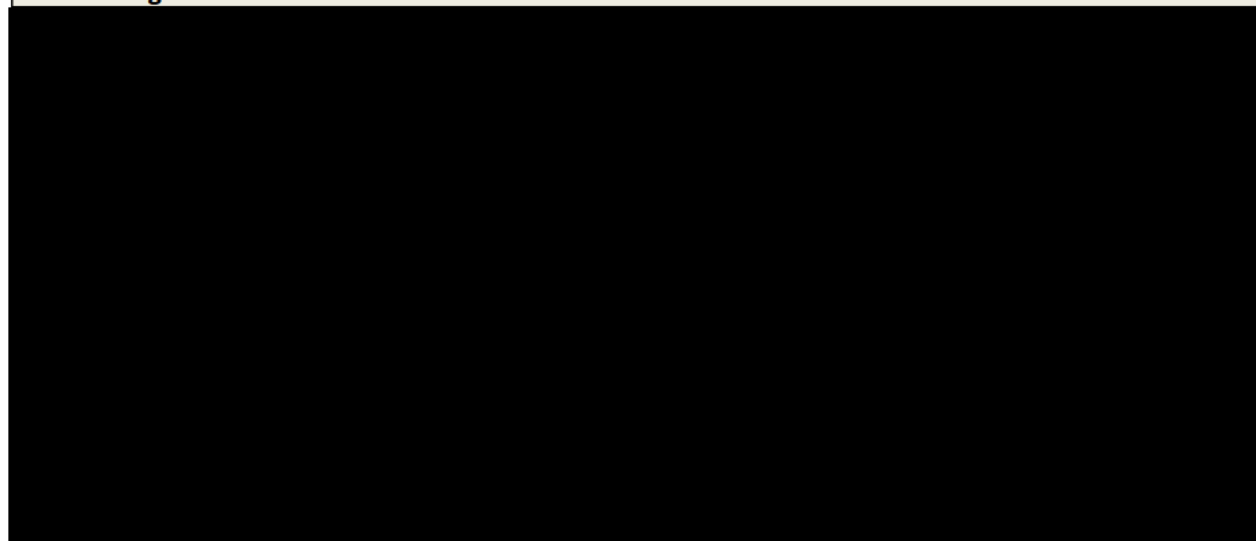
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Cased hole logs, test and surveys before conversion to In Zone monitoring wells
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Cased hole logs, test and surveys during the recompletion of the stratigraphic wells to In Zone monitoring wells.
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Table POT-7—Logging, testing and surveying for [REDACTED]

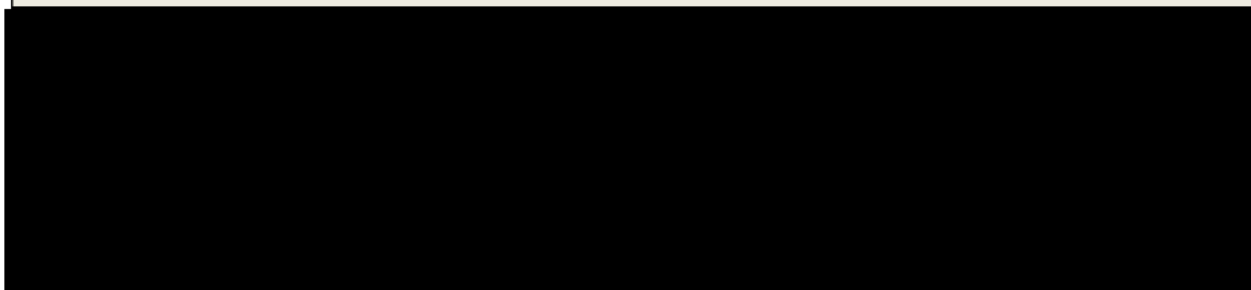
Method	Interval (ft)	Purpose
Open hole logs, test and surveys during construction		

[REDACTED]		
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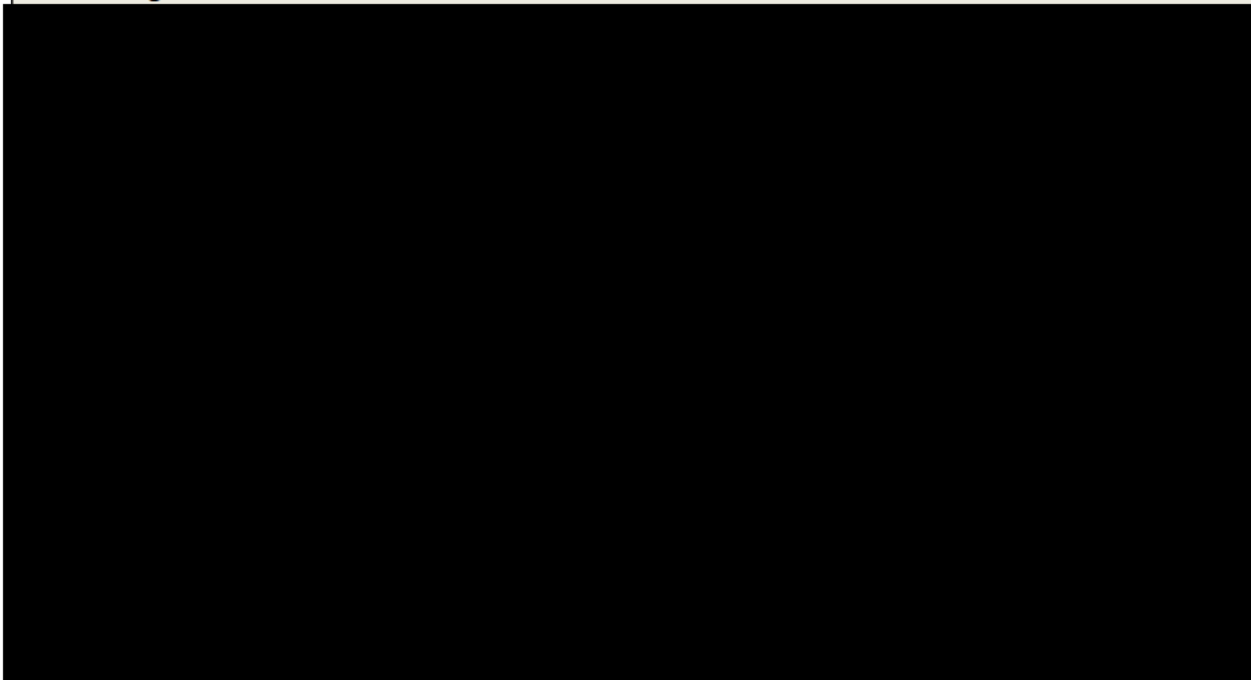
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Cased hole logs, test and surveys before conversion to In Zone monitoring wells
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Cased hole logs, test and surveys during the recompletion of the stratigraphic wells to In Zone monitoring wells.
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Table POT-8 shows the planned program to acquire rock material and fluid samples from the confining zones and injection targets.

Table POT-8—Sidewall core (SWC) and water sampling for [REDACTED]			
Method	Interval (ft)	Samples	Purpose
[REDACTED]			

Table POT-4 shows the analytics to be characterized in the reservoir and above confining zone samples that will be collected in the [REDACTED] wells.

During the drilling operations in [REDACTED], 1PointFive plans to collect approximately [REDACTED]
[REDACTED]

Table POT-9 describes the tests planned to be performed on the [REDACTED]
[REDACTED]

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Table POT-9

A large black rectangular redaction box covering the entire content of Table POT-9.

Table POT-10 shows the program to perform formation tests in the [REDACTED] well after the well is cased to acquire information about [REDACTED]

Table POT-10

Method	Interval (ft)	Purpose
[REDACTED]		

Note: Specific depths for each test will be selected after the well is drilled and formations are identified with the electric logs.

Detailed procedures and descriptions for each of the logging tools and test are included in the QASP (Quality Assurance and Surveillance Plan) Plan of this application.

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4.0 Pre-Injection Test Plan – Above-Confining-Zone Monitoring Well

██████████ will be a new well drilled as part of the Kleberg Hub. Table POT-11 shows the proposed logging, testing, surveys, and mud log sampling program for this well.

Table POT-11—Logging, testing and surveying for

[illegible]

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[REDACTED]

The original pressure and temperature in the above confining zone will be measured with a downhole gauge [REDACTED], as described in the Well Construction Plan. This well will be acquiring water samples in the [REDACTED], and the samples will be analyzed as described in the Testing and Monitoring Plan of this application.

5.0 Pre-Injection Test Plan – Shallow-Aquifer Monitoring Wells

[REDACTED]

will be shallow wells drilled in the USDW section. These wells will not have any additional logs or surveys since they are located [REDACTED]. These wells will be sampled as part of the testing and monitoring program to monitor groundwater during the construction, injection, and post injection periods of the Kleberg Hub operation.

Notes:

Detailed procedures and descriptions for each of the logging tools and test are included in the QASP (Quality Assurance and Surveillance Plan) Plan of this application.

All pre-injection formation testing procedures for logging, sampling, and testing, as required by 40 CFR 146.87, will be submitted to the Director for review. The results of the testing activities will be documented in a report and submitted to the US Environmental Protection Agency (EPA) after the well is drilled and testing activities have been completed, but before the start of CO₂ injection operations.

1PointFive will notify the EPA at least 30 days prior to conducting a test and provide a detailed description of the testing procedure. Notice and the opportunity to witness these tests/logs shall be provided to the EPA at least 48 hours in advance of a given test/log.