OMB No. 2040-0042 Approval Expires 11/30/2014

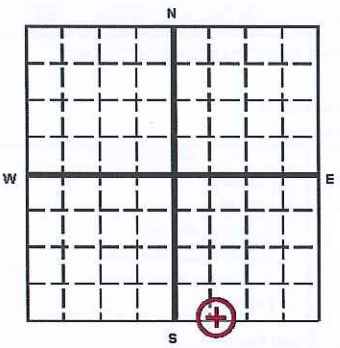
EPA

United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility	Name and Address of Owner/Operator
Well MS4, FutureGen 2.0, Morgan County, IL	FutureGen Alliance 73 Central Park Plaza East, Jacksonville, IL 62650

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Illinois	Morgan	

Surface Location Description

sw 1/4 of se 1/4 of sw 1/4 of se 1/4 of Section 34 Township 16n Range 9w

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location ____ ft. frm (N/S) ____ Line of quarter section
and ____ ft. from (E/W) ____ Line of quarter section.

TYPE OF AUTHORIZATION
- [✓] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

WELL ACTIVITY
- [ ] CLASS I
- [ ] CLASS II
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Lease Name ____ Well Number ____

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
13-3/8	54	0-130	130	17.5"
7-5/8	26.4	0-350	350	11.5"

METHOD OF EMPLACEMENT OF CEMENT PLUGS
- [✓] The Balance Method
- [ ] The Dump Bailer Method
- [ ] The Two-Plug Method
- [ ] Other

CEMENTING TO PLUG AND ABANDON DATA:	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inche	7-5/8"						
Depth to Bottom of Tubing or Drill Pipe (ft	330						
Sacks of Cement To Be Used (each plug)	74						
Slurry Volume To Be Pumped (cu. ft.)	87						
Calculated Top of Plug (ft.)	0						
Measured Top of Plug (if tagged ft.)	0						
Slurry Wt. (Lb./Gal.)	15.6						
Type Cement or Other Material (Class III)	Class A						

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To

Estimated Cost to Plug Wells

$25,000

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Kenneth K. Humphreys, Chief Executive Officer	Kenneth K. Humphreys	03/03/2014

EPA Form 7520-14 (Rev. 12-11)

OMB No. 2040-0042 Approval Expires 11/30/2014

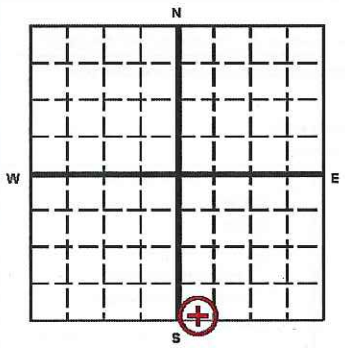
United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility
Well MS5, FutureGen 2.0, Morgan County, IL

Name and Address of Owner/Operator
FutureGen Alliance
73 Central Park Plaza East, Jacksonville, IL 62650

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Illinois	Morgan	

Surface Location Description
SW 1/4 of SW 1/4 of SW 1/4 of SE 1/4 of Section 26 Township 16n Range 9w

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location ____ ft. frm (N/S) ____ Line of quarter section
and ____ ft. from (E/W) ____ Line of quarter section.

TYPE OF AUTHORIZATION
- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

WELL ACTIVITY
- [ ] CLASS I
- [ ] CLASS II
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Lease Name ____ Well Number ____

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
13-3/8	54	0-130	130	17.5"
7-5/8	26.4	0-350	350	11.5"

METHOD OF EMPLACEMENT OF CEMENT PLUGS
- [x] The Balance Method
- [ ] The Dump Bailer Method
- [ ] The Two-Plug Method
- [ ] Other

CEMENTING TO PLUG AND ABANDON DATA:	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
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Slurry Volume To Be Pumped (cu. ft.)	87						
Calculated Top of Plug (ft.)	0						
Measured Top of Plug (if tagged ft.)	0						
Slurry Wt. (Lb./Gal.)	15.6						
Type Cement or Other Material (Class III)	Class A						

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To

Estimated Cost to Plug Wells
$25,000

Certification

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Name and Official Title *(Please type or print)*	Signature	Date Signed
Kenneth K. Humphreys, Chief Executive Officer	Kenneth K. Humphreys	03/03/2014

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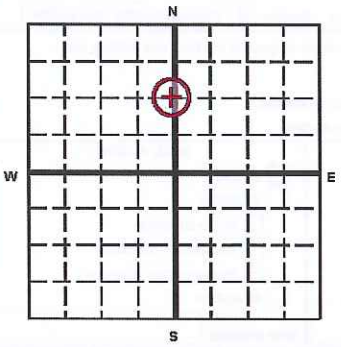
United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility
Well TM1, FutureGen 2.0, Morgan County, IL

Name and Address of Owner/Operator
FutureGen Alliance
73 Central Park Plaza East, Jacksonville, IL 62650

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Illinois	Morgan	

Surface Location Description
se 1/4 of se 1/4 of ne 1/4 of nw 1/4 of Section 27 Township 16n Range 9w

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location ____ ft. frm (N/S) ____ Line of quarter section
and ____ ft. from (E/W) ____ Line of quarter section.

TYPE OF AUTHORIZATION
- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

WELL ACTIVITY
- [ ] CLASS I
- [ ] CLASS II
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Lease Name

Well Number

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
7-5/8	26.4	0-20	20	11.5"

METHOD OF EMPLACEMENT OF CEMENT PLUGS
- [ ] The Balance Method
- [ ] The Dump Bailer Method
- [ ] The Two-Plug Method
- [x] Other

CEMENTING TO PLUG AND ABANDON DATA:	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inche	7-5/8"						
Depth to Bottom of Tubing or Drill Pipe (ft	20						
Sacks of Cement To Be Used (each plug)	4						
Slurry Volume To Be Pumped (cu. ft.)	5						
Calculated Top of Plug (ft.)	0						
Measured Top of Plug (if tagged ft.)	0						
Slurry Wt. (Lb./Gal.)	15.6						
Type Cement or Other Material (Class III)	Class A						

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To

Estimated Cost to Plug Wells
$2,000

Certification

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Name and Official Title *(Please type or print)*	Signature	Date Signed
Kenneth K. Humphreys, Chief Executive Officer	Kenneth K Humphreys	03/03/2014

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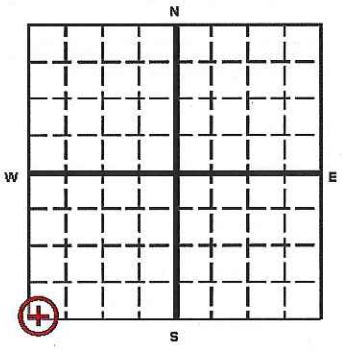
United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility	Name and Address of Owner/Operator
Well TM2, FutureGen 2.0, Morgan County, IL	FutureGen Alliance 73 Central Park Plaza East, Jacksonville, IL 62650

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Illinois	Morgan	

Surface Location Description

SW 1/4 of SW 1/4 of SW 1/4 of SW 1/4 of Section 31 Township 16n Range 9w

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location ____ ft. frm (N/S) ____ Line of quarter section
and ____ ft. from (E/W) ____ Line of quarter section.

TYPE OF AUTHORIZATION
- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

WELL ACTIVITY
- [ ] CLASS I
- [ ] CLASS II
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Lease Name ____ Well Number ____

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
7-5/8	26.4	0-20	20	11.5"

METHOD OF EMPLACEMENT OF CEMENT PLUGS
- [ ] The Balance Method
- [ ] The Dump Bailer Method
- [ ] The Two-Plug Method
- [x] Other

CEMENTING TO PLUG AND ABANDON DATA:	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
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Depth to Bottom of Tubing or Drill Pipe (ft	20						
Sacks of Cement To Be Used (each plug)	4						
Slurry Volume To Be Pumped (cu. ft.)	5						
Calculated Top of Plug (ft.)	0						
Measured Top of Plug (if tagged ft.)	0						
Slurry Wt. (Lb./Gal.)	15.6						
Type Cement or Other Material (Class III)	Class A						

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To

Estimated Cost to Plug Wells

$2,000

Certification

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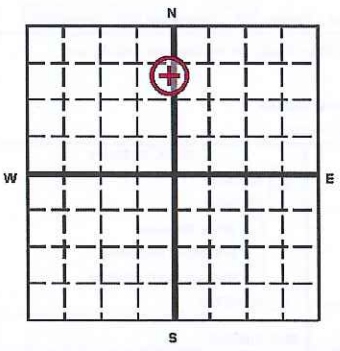
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility
Well TM3, FutureGen 2.0, Morgan County, IL

Name and Address of Owner/Operator
FutureGen Alliance
73 Central Park Plaza East, Jacksonville, IL 62650

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Illinois	Morgan	

Surface Location Description
ne 1/4 of se 1/4 of ne 1/4 of nw 1/4 of Section 25 Township 16n Range 9w

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location ____ ft. frm (N/S) ____ Line of quarter section
and ____ ft. from (E/W) ____ Line of quarter section.

TYPE OF AUTHORIZATION
- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

Lease Name

WELL ACTIVITY
- [ ] CLASS I
- [ ] CLASS II
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Well Number

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
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LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To

Estimated Cost to Plug Wells
$2,000

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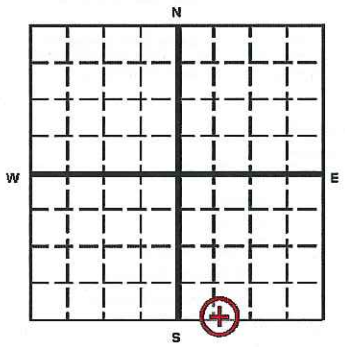
PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility	Name and Address of Owner/Operator
Well MS4, FutureGen 2.0, Morgan County, IL	FutureGen Alliance 73 Central Park Plaza East, Jacksonville, IL 62650

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Illinois	Morgan	

Surface Location Description

sw 1/4 of se 1/4 of sw 1/4 of se 1/4 of Section 34 Township 16n Range 9w

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location ____ ft. frm (N/S) ____ Line of quarter section and ____ ft. from (E/W) ____ Line of quarter section.

TYPE OF AUTHORIZATION

- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

Lease Name

WELL ACTIVITY

- [ ] CLASS I
- [ ] CLASS II
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Well Number

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
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Measured Top of Plug (if tagged ft.)	0						
Slurry Wt. (Lb./Gal.)	15.6						
Type Cement or Other Material (Class III)	Class A						

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To

Estimated Cost to Plug Wells

$2,000

Certification

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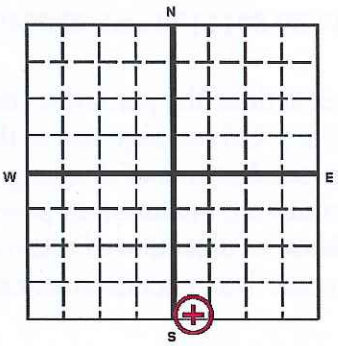
PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility
Well MS5, FutureGen 2.0, Morgan County, IL

Name and Address of Owner/Operator
FutureGen Alliance
73 Central Park Plaza East, Jacksonville, IL 62650

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Illinois	Morgan	

Surface Location Description
sw 1/4 of sw 1/4 of sw 1/4 of se 1/4 of Section 26 Township 16n Range 9w

Locate well in two directions from nearest lines of quarter section and drilling unit
Surface Location ____ ft. frm (N/S) ____ Line of quarter section
and ____ ft. from (E/W) ____ Line of quarter section.

TYPE OF AUTHORIZATION
- [✓] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

Lease Name

WELL ACTIVITY
- [ ] CLASS I
- [ ] CLASS II
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Well Number

CASING AND TUBING RECORD AFTER PLUGGING

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Measured Top of Plug (if tagged ft.)	0						
Slurry Wt. (Lb./Gal.)	15.6						
Type Cement or Other Material (Class III)	Class A						

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To

Estimated Cost to Plug Wells
$2,000

Certification

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Kenneth K. Humphreys, Chief Executive Officer	Kenneth K Humphreys	03/03/2014

EPA Form 7520-14 (Rev. 12-11)

ATTACHMENT F: EMERGENCY AND REMEDIAL RESPONSE PLAN

Facility Name: FutureGen 2.0 Morgan County CO_2 Storage Site
IL-137-6A-0001 (Well #1)

Facility Contacts: Kenneth Humphreys, Chief Executive Officer,
FutureGen Industrial Alliance, Inc., Morgan County Office,
73 Central Park Plaza East, Jacksonville, IL 62650, 217-243-8215

Location of Injection Well: Morgan County, IL; 26–16N–9W; 39.80111°N and 90.07491°W

This Emergency and Remedial Response Plan (ERRP) describes actions the permittee (the FutureGen Alliance) will take at the FutureGen 2.0 Morgan County CO_2 storage site in the unlikely event of an emergency that could endanger any underground source of drinking water (USDW) within the project Area of Review (AoR) during construction, operation or post-injection site care. Such events may include unplanned CO_2 release or detection of unexpected movement of CO_2 or associated fluids in or from the injection zone. This plan demonstrates how the FutureGen Alliance will comply with 40 CFR 146.94.

If information from the FutureGen 2.0 monitoring network (described in the Testing and Monitoring Plan) indicates that injected CO_2 and/or associated fluid migration or pressures have occurred which could endanger a USDW, the FutureGen Alliance will take the following actions:

1. Cease injection according to the procedures in the Class VI permit and close down the injection wells.
2. Perform appropriate steps to identify and characterize the source and cause of the adverse incident that has the potential to endanger a USDW or release CO_2.
3. Notify the U.S. Environmental Protection Agency (EPA) Underground Injection Control (UIC) Program Director of the adverse incident within 24 hours.
4. Implement necessary remedial actions, including those outlined in this Emergency Response and Remediation Plan

Part 1: Resources or Infrastructure Potentially Affected

Four USDW aquifer zones are located in the AoR, ranging from the deep St. Peter Sandstone (approximately 2,000 ft above the top of the injection zone) to the surficial aquifer system approximately 3,700 ft above the injection zone. The surficial aquifer system is a significant groundwater resource within the AoR. Response actions to CO_2 or saline migration into a USDW would vary according to the aquifer. It should be noted that the leak would be detected and response actions would be conducted in the lowermost USDW—St. Peter Sandstone—far in advance before shallower USDWs would be affected unless a leak were to occur along an injection well or deep monitoring well.

The land is used primarily for agriculture. Residences and farm-related buildings are scattered across the land surface, particularly along roads. Surface-water features such as creeks, streams,

and impoundments formed by small earthen dams are also present in the area. Limited stretches of woodland parallel stretches of streams. Most of the land surface is farmland. Shallow (<100ft bgs) groundwater-supply wells are associated with residences. The injection site will eventually have a pipeline and some small buildings. Figure 1 shows the surface water features within the AoR for this project. Figure 2 shows additional surface features in the survey area.

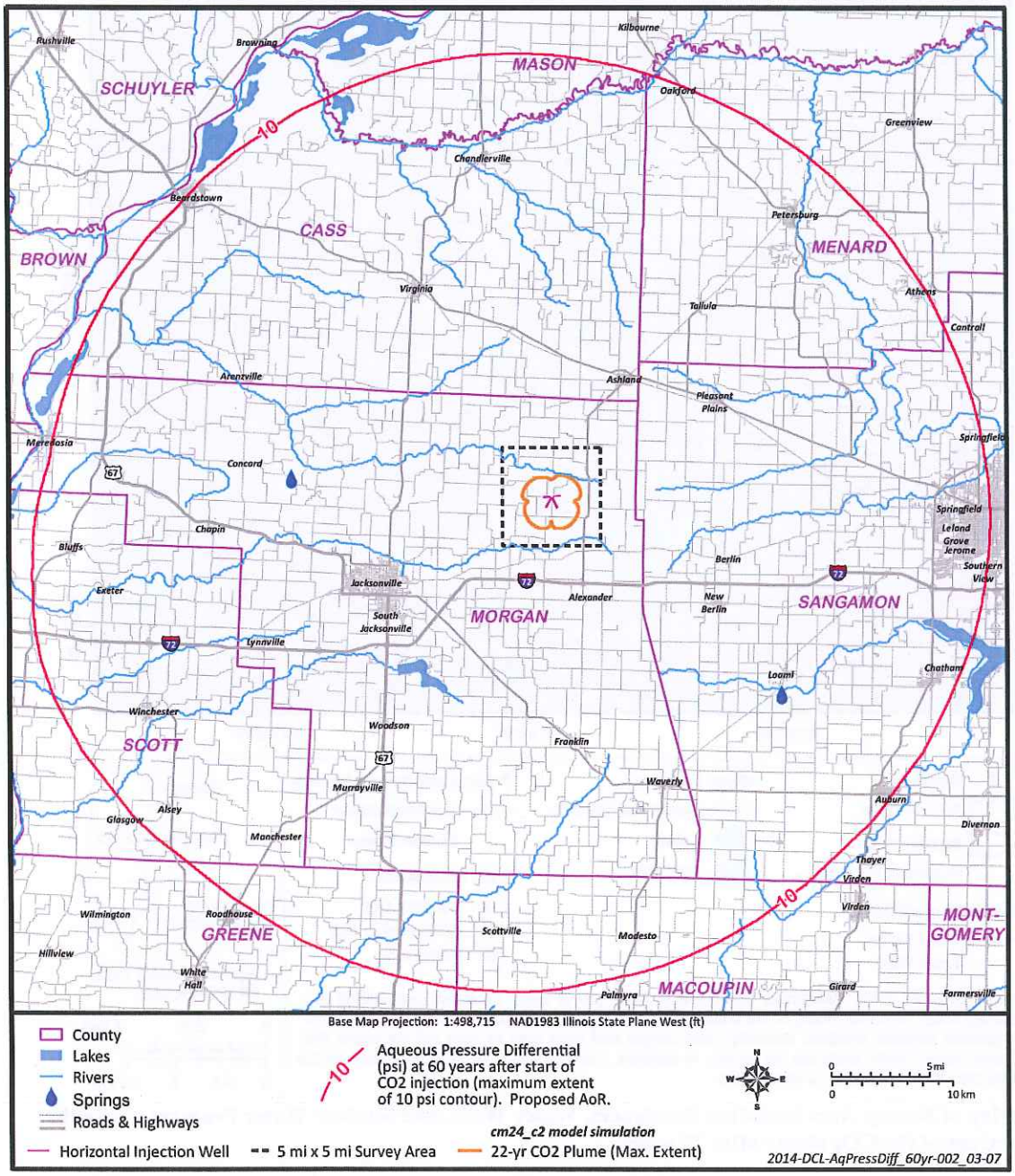

Figure 1. Map of Surface-Water Features within the Area of Review.

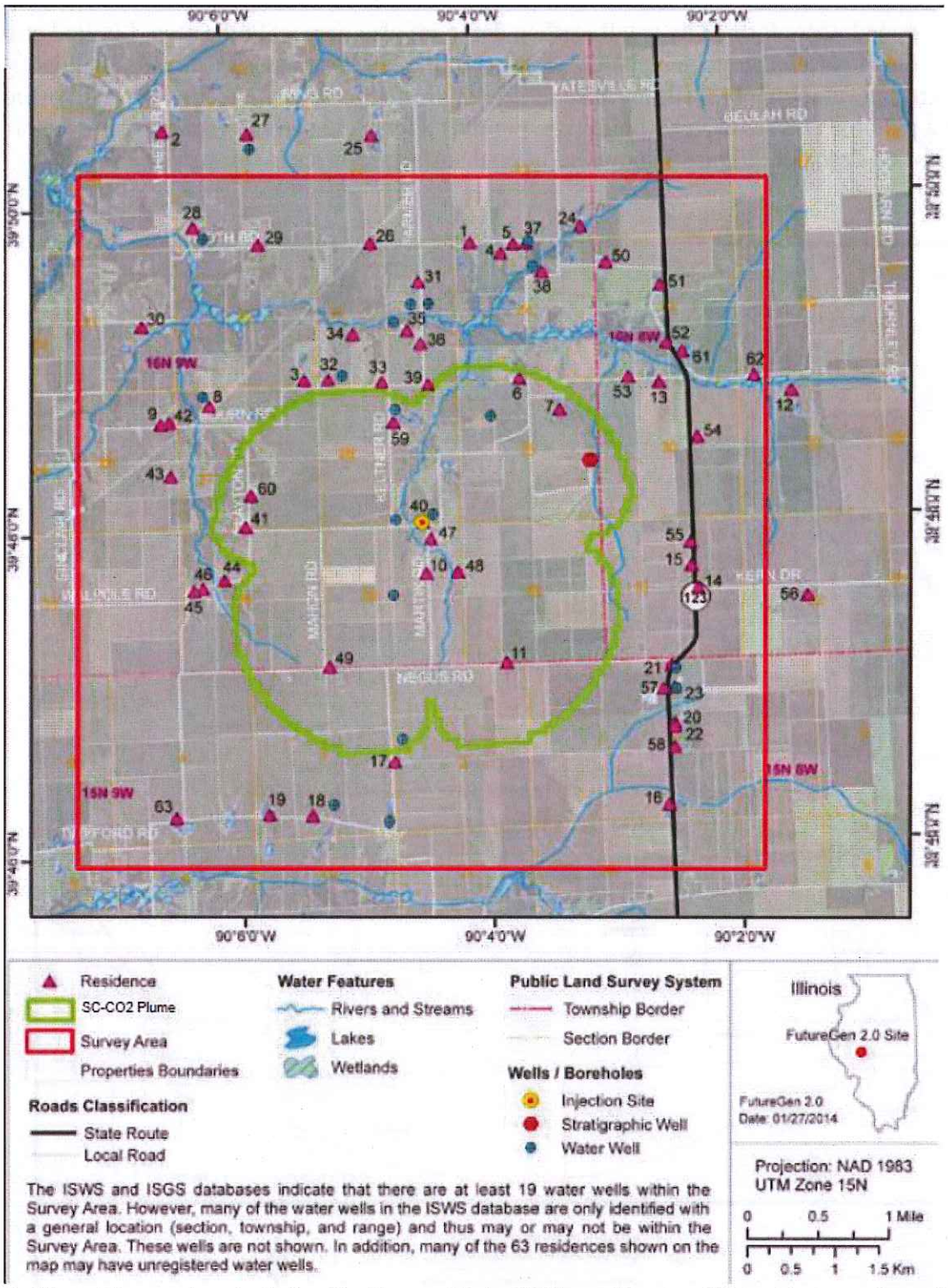

Figure 2. Map of Survey Area including Residences, Water Wells, and Surface-Water Features above the predicted extent of the CO_2 plume after 22 years.

Part 2: Identification of Adverse Incidents

The possible adverse incident scenarios identified in Table 1 consist of both slow and sudden releases of CO_2 or brine. Such releases will result in the implementation of emergency or remedial actions as described in Part 3 (of this plan). It should be noted that the worst-case consequences of various scenarios are developed to ensure that response plans are in place for all eventualities.

Table 1 lists the types of potential adverse incidents that will trigger response actions to protect USDWs if the incidents occur during the construction, injection, and post-injection site-care periods. The activities that the FutureGen Alliance will undertake in response to these incidents are described in Part 3 (of this plan).

Table 1. Potential Adverse Incidents

Construction Period

- Over-pressurized natural gas (blow out)
- Movement of brine between formations during drilling

Injection Period

- Loss of mechanical integrity (injection or monitoring wells)
- Rapid and/or unexpected movement of CO_2 outside defined AoR
- Migration of CO_2 from injection zone through faults and fractures
- Migration of CO_2 from injection zone through undocumented wells
- Migration of CO_2 from injection zone through failure of the confining zone (loss of containment)
- Monitoring equipment failure or malfunction
- Movement of brine or CO2 from injection zone to overlying USDW
- Natural disaster (such as severe weather)
- Seismic event

Post-Injection Site-Care Period

- Loss of mechanical integrity (monitoring wells)
- Rapid and/or unexpected movement of CO2 outside defined AoR
- Migration of CO2 from injection zone through faults and fractures
- Migration of CO2 from injection zone through undocumented wells
- Migration of CO2 from injection zone through failure of the confining zone (loss of containment)
- Monitoring equipment failure or malfunction
- Movement of brine or CO2 from injection zone to overlying USDW
- Natural disaster (such as severe weather)
- Seismic event

Remedial response actions implemented at the FutureGen 2.0 site will be proportional to the severity of the condition triggering the emergency actions. The severity of the emergency condition are categorized as major, serious, or minor as defined in Table 2.

Table 2. Definition of the Severity of Adverse Incidents

Consequence Degree of Severity	Definition
HIGH (Major Emergency)	Known release or indication of a potential incident which poses an immediate (acute) risk to human health, resources, or infrastructure. Response actions involving local authorities (evacuation, isolation of areas, or restrictions on water usage) should be initiated. Example:well blowout during injection.
MEDIUM (Serious Emergency)	Incidents/releases posing potential (chronic) risk to human health, resources, or infrastructure if conditions worsen or no (mitigative/remedial) response actions are taken. Examples: well seal failures, detection of increased pressure or indicators of CO_2 in zones above caprock.
LOW (Minor Emergency)	Incident poses a challenge to confinement barrier but does not result in the immediate release of CO_2 or brine posing a risk to human health, resources or infrastructure. Example: higher than anticipated pressure in monitoring wells.

Part 3: Emergency Identification and Response Actions to Protect USDWs

This arrangement of responses is conceptual; the severity of an adverse incident will determine the actual response(s) deployed and will be executed following notification of, and in consultation with, the UIC Program Director. If any adverse incident has the potential to endanger a USDW, the FutureGen Alliance will notify the UIC Program Director within 24 hours. After the implementation of actions taken to address the emergency, the FutureGen Alliance will demonstrate the efficacy of the remedial response actions to the satisfaction of the UIC Program Director before resuming injection operations. Injection operations will resume when authorized by the UIC Program Director after having established that all requirements have been met.

Where the phrase "initiate shutdown plan" is used, the following protocol will be employed: the FutureGen Alliance will immediately cease injection and will notify the power plant that it is not currently injecting CO_2.

If an adverse incident occurs, the FutureGen Alliance will deploy a variety of emergency or remedial responses depending on the circumstances (e.g., the location, type, and volume of a release) to protect USDWs. Any unanticipated incident or condition observed to pose a threat to groundwater, surface water, infrastructure, or people will be treated as an adverse incident ("emergency"). Response actions will depend upon the severity of the adverse incident, as defined in Table 2. This part of the ERRP summarize the types of adverse incidents that could occur and the likely sequence of responses that would be undertaken to protect USDWs during construction, injection, and post-injection site care. Emergency and remedial responses will be considered in a sequence of progressively more extensive actions corresponding to the degree of severity. The list for each adverse incident is ordered accordingly.

ADVERSE INCIDENTS POTENTIALLY AFFECTING USDWS: CONSTRUCTION PERIOD

Event/Description: Over-pressurized fluid (blowout): This event could occur during well drilling, if a pocket of high pressure gas or fluid is encountered resulting in a sudden release.

Severity: High

Time of Event: Drilling

Avoidance Measures: Care in drilling; use and maintain blow out preventer at wellhead; control drilling fluid density.

Detection Methods: Well pressure, annulus pressure monitoring. Drilling fluid (mud) return flow and density, pressure.

Potential Response Actions: Specific response will depend on the type of well (injection or monitoring). In general, the following will be undertaken:

- Stop drilling.
- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Verify proper and complete operation of blowout preventer hardware.
- Inject heavy fluid to regain hydrostatic control.
- Close flow valve (wellhead).
- Check the drilling and mud logs in an attempt to identify cause.
- See Part 3.1 for details on further response.

Response Personnel: Drilling crew, supervising professionals, geotechnical subcontractors.

Equipment: Existing or newly mobilized drill rig, logging equipment, cement or casing as required.

Event/Description: Movement of brine between formations: As a well is drilled, multiple concentric strings of casing are installed and cemented. If the cement seal with the outer annulus or inner annuli failed, there will be a pathway for cross contamination of formations, including USDWs.

Severity: Medium

Time of Event: Construction/drilling

Avoidance Measures: Care in well construction particularly with respect to cement placement.

Detection Methods: Monitoring of drilling column pressure, well pressure, annulus pressure, drilling fluid (mud) return flow, and density pressure.

Potential Response Actions: Specific response will be dependent on the type of well (injection or monitoring). In general, the following will be undertaken:

- Stop drilling.
- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Seal off leaking formation by setting packer.
- Check the monitoring record in an attempt to identify cause.
- Run well logging tools to locate source of cross contamination.
- Identify and implement corrective actions, such as grout injection to seal off zone, re-drill.

Response Personnel: Drilling crew, supervising professionals, geotechnical subcontractors.

Equipment: Existing or newly mobilized drill rig, logging equipment, cement, or casing as required.

ADVERSE INCIDENTS POTENTIALLY AFFECTING USDWS: INJECTION PERIOD

Event/Description: Loss of Mechanical Integrity: If the cement behind casing or inner annuli failed, there could be a pathway for cross contamination of formations, including USDWs. During injection, CO_2 could travel through geologic formations above the injection and confining zones into a USDW.

Severity: Medium

Time of Event: Operations/injection

Avoidance Measures: Care in well construction particularly with respect to cement placement, including use of casing centralizers.

Detection Methods: Well pressure, annulus pressure, gas flow rate monitoring; well annulus pressure maintenance and monitoring system; continuous monitoring of injection mass flow rate, pressure, temperature, annular pressure, and fluid volume; oxygen-activation tracer logging; noise logging; temperature logging; pressure fall-off testing. See the Testing and Monitoring Plan for specific information.

Potential Response Actions: Specific response will depend on the type of well (injection or monitoring). In general, the following will be undertaken:

- Initiate shutdown plan.
- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Close flow valve (wellhead).
- Check the monitoring record in an attempt to identify cause.

For Major or Serious Emergency

- Monitor well pressure, temperature, annulus pressure.
- Log hole; check casing and borehole condition.
- Determine cause and extent of failure.
- Grout or install chemical sealant barrier in an adjoining well to block leak.
- Abandon well by completely closing it (seal with cement).
- Drill new well if necessary.
- Identify and implement appropriate remedial actions to repair damage to the well (in consultation with the UIC Program Director).
- If contamination is detected, conduct groundwater remediation as required (in consultation with the UIC Program Director).

For Minor Emergency

- Reset automatic shutdown devices.
- Monitor well pressure, temperature, annulus pressure.
- Verify integrity loss and determine cause and extent of failure.
- Identify and implement corrective actions.
- See Part 3.1 for details on further response.

Response Personnel: Drilling crew, supervising professionals, geotechnical subcontractors.

Equipment: Existing or newly mobilized drill rig, logging equipment, cement or casing as required.

Event/Description: Migration of CO_2 from injection zone through faults and fractures:
This event could occur as a result of CO_2 migrating through existing, unknown faults or fractures or new, seismically induced faults or fractures.

Severity: Medium

Time of Event: Operations/injection

Avoidance Measures: Extensive geophysical characterization has not identified faults or fractures.

Detection Methods: Early leak-detection monitoring in Above Confining Zone (ACZ) well; USDW aquifer monitoring in USDW well. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Initiate shutdown plan.
- Notify the UIC Program Director within 24 hours, per 40 CFR 146.91(c)(3)
- Assess cause by reviewing monitoring data.
- Conduct geophysical survey in an attempt to locate leaks.
- If warranted, resume injection, but reduce injection pressure by reducing flow rate or inject through additional injection wells.
- Intensify monitoring to determine whether migration continues with continued injection.
- Lower reservoir pressure by removing liquids (water, brine, etc.) from the storage reservoir.
- Intersect the migration with extraction wells in the vicinity of the leak, withdraw and re-inject.
- Lower the reservoir pressure by promoting new pathways to access new volumes or strata in the storage reservoir.
- Create a hydraulic barrier by increasing reservoir pressure upstream of the leak.
- Inject grout or chemical sealant to block the leak.
- If contamination is detected, identify and implement appropriate remedial actions (in consultation with the UIC Program Director).
- See Part 3.2 for details on further response.

Response Personnel: Onsite operating staff, supervising professionals, geophysical consultants.

Equipment: Newly mobilized drill rig, geophysics monitoring trucks.

Event/Description: Migration of CO_2 from injection zone through undocumented wells:
This event could occur as a result of undocumented wells serving as artificial conduits for fluid migration.

Severity: Medium to high depending upon location

Time of Event: Operations/injection

Avoidance Measures: Drilling records reviews and site walkthroughs were conducted. Only three wells were identified and none penetrate the confining zone.

Detection Methods: Early leak-detection monitoring in ACZ well; evidence of gas/water venting at or near the surface proximate to the undocumented well; USDW aquifer monitoring in USDW well. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Initiate shutdown plan.
- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Assess the cause by reviewing monitoring data.
- Conduct a geophysical survey in an attempt to locate migration.
- Repair leaking wells by re-plugging with cement.
- Plug and abandon wells that cannot be repaired.
- Create a hydraulic barrier by increasing reservoir pressure upstream of the leak.
- Install chemical sealant or grout barriers to block leaks.
- If contamination is detected, identify and implement appropriate remedial actions (in consultation with the UIC Program Director).
- See Part 3.2 for details on further response.

Response Personnel: Drilling crew, supervising professionals, geotechnical subcontractors.

Equipment: Newly mobilized drill rig, logging equipment, cement or casing as required.

Event/Description: Migration of CO_2 from injection zone through failure of the confining zone (loss of containment): This event could occur as a result of CO_2 migrating through a compromised confining zone.

Severity: Medium

Time of Event: Operations/injection

Avoidance Measures: Careful monitoring and control of injection flow and pressure with periodic monitoring well sampling.

Detection Methods: Early leak-detection monitoring in ACZ well. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Initiate shutdown plan.
- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Verify integrity of well bore.
- Proceed to response for migration of CO_2 through loss of mechanical integrity, through faults or fractures, or through undocumented abandoned wells according to location of migration and conduct groundwater remediation as required.
- See Part 3.2 for details on further response.

Response Personnel: Onsite operating staff, supervising professionals, geophysical consultants.

Equipment: Newly mobilized drill rig, geophysics monitoring trucks.

Event/Description: Monitoring well equipment malfunction: Failure or malfunction of well instrumentation that monitors wellhead pressure, temperature, or annulus pressure could result in false readings. In this event, the reservoir could become over-pressurized, possibly resulting in fractures in the confining zone.

Severity: Low; Possibly Medium if injection is not stopped and results in overpressurization

Time of Event: Operations/ injection

Avoidance Measures: Preventive maintenance of equipment.

Detection Methods: Pressure fall-off testing; monitoring of well pressure, temperature, specific conductivity. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Repair monitoring instrumentation
- If repairs cannot be made within hours, then:
  - Initiate shutdown plan.
  - Repair or replace instrumentation.
  - Review monitoring records.
  - Perform reservoir injection tests to determine whether and where fracturing has occurred.
  - Completely close the well (seal with cement).
  - Drill new well if necessary.
  - Conduct groundwater remediation as required (in consultation with the UIC Program Director).
- See Part 3.6 for details on further response.

Response Personnel: Drilling crew, supervising professionals, geotechnical and instrument subcontractors.

Equipment: Newly mobilized drill rig and/or instrument repair truck.

Event/Description: Movement of brine from injection zone: This event could occur as a result of CO_2 migration along existing unknown faults or fractures, seismically induced faults or fractures, or failure of the confining zone (loss of containment).

Severity: Medium

Time of Event: Operations/injection

Avoidance Measures: Careful monitoring and control of injection flow and pressure with periodic monitoring well sampling.

Detection Methods: Early leak-detection monitoring in ACZ well; USDW aquifer monitoring in USDW well. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Initiate shutdown plan.

- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Assess cause by reviewing monitoring data.
- Proceed to response for migration of CO_2 from injection zone through faults or fractures according to location of migration and conduct groundwater remediation as required.
- See Part 3.3 for details on further response.

Response Personnel: Onsite operating staff, supervising professionals, geophysical consultants.

Equipment: Newly mobilized drill rig, geophysics monitoring trucks.

Event/Description: Seismic event: If a seismic event were to occur inducing movement along faults or fractures, well leakage could occur.

Severity: Low to Medium depending upon quake magnitude and location

Time of Event: Operations/injection

Avoidance Measures: The site is located in a seismically stable region.

Detection Methods: Passive seismic monitoring (microseismicity). See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Initiate shutdown plan to stabilize reservoir system.
- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Evaluate integrity of storage volume by gas pressure response and monitoring instrumentation.
- If a leak is detected, conduct a geophysical survey to locate new fracture zone.
- If warranted, resume injection but reduce injection pressure by reducing flow rate or inject through additional injection wells.
- Intensify monitoring to determine whether migration is continuing with continued injection.
- Lower reservoir pressure by removing liquids (water, brine, etc.) from the storage reservoir.
- Intersect the migration with extraction wells in the vicinity of the leak, withdraw, and re-inject.
- Lower the reservoir pressure by promoting new pathways to access new volumes or strata in the storage reservoir.
- Create a hydraulic barrier by increasing reservoir pressure upstream of the leak.
- Inject grout or chemical sealant to block leak.
- Extract CO_2 from reservoir, and re-inject in more suitable location.
- If contamination is detected, identify and implement appropriate remedial actions (in consultation with the UIC Program Director).
- Investigate the cause of the seismic event.
  - If the event was induced as a result of injection activities, determine whether any operational changes are needed to reduce the likelihood or magnitude of future events.

  - Communicate the investigation and findings to the public (see Part 5).
- See Part 3.4 for details on further response.

Response Personnel: Onsite operations staff, drilling crew, supervising professionals, geotechnical contractors, mechanical contractors, as required.

Equipment: Newly mobilized drill rig, logging equipment, cement or casing, as required.

Event/Description: Groundwater/USDW contamination: If there were a failure of the confining zone, failure of the injection or monitoring well, or if the plume encounters an undocumented AoR well, CO_2 or brine could reach groundwater, requiring remediation.

Severity: Medium to High depending upon location

Time of Event: Operations/injection

Avoidance Measures: The entire CO_2 injection project is focused on preventing escape of CO_2 while sequestering the CO_2. The FutureGen oxy-combustion process incorporates gas-cleaning processes to remove at least 97% of contaminants, including mercury, prior to injection. Trace contaminants that might be entrained in CO_2 leaking into USDWs will pose inconsequential risk to the water quality.

Detection Methods: USDW aquifer monitoring in USDW well. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Initiate shutdown plan.
- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Assess cause by reviewing monitoring data.
- Conduct a geophysical survey in an attempt to locate migration.
- Identify and implement appropriate remedial actions (in consultation with the UIC Program Director). If the leak cannot be located or while pursuing corrective measures for the leak, the following remedies may be considered:
  - Drill wells to intersect accumulations in groundwater, preferably near CO_2 aquifer entrance zones.
  - Extract groundwater contaminated with gaseous or dissolved CO_2 water and treat ex situ.
  - Dissolve mineralized CO_2 (carbonates) in water and extract as a dissolved phase through an extraction well for ex situ air stripping.
  - Extract groundwater with metals mobilized by CO_2 and treat ex situ to remove metals and residual CO_2.
  - Use hydraulic barriers to immobilize and contain contaminants by deploying injection and extraction wells.
  - Deploy in situ chemical or biological treatment technologies to enhance biochemical degradation or stabilization of CO_2 -related contaminants.
  - Create a hydraulic barrier by increasing reservoir pressure upstream of a leak.
  - Place grouts or chemical sealant barriers to block leaks.

  - Discontinue injection.
  - Provide individual water-treatment systems for each water-supply well user. The configuration for each ex situ treatment system will be determined by water chemistry. Applicable treatment technologies include but are not limited to aeration, pH adjustment, ion exchange, oxidizing filter (manganese greensand), membrane filtration, etc.).
- See Parts 3.2 and 3.3 for details on further response.

Response Personnel: Drilling crew, supervising professionals, geotechnical subcontractors, environmental or water-treatment contractors.

Equipment: Water-treatment equipment, new wellhead plumbing to and from water-treatment equipment, reagents for optional in situ treatment, newly mobilized drill rig, logging equipment, cement or casing, as required.

ADVERSE INCIDENTS POTENTIALLY AFFECTING USDWS: POST-INJECTION SITE-CARE PERIOD

Event/Description: Loss of mechanical integrity (monitoring wells): During the post-injection period, CO_2 could travel through a compromised monitoring well into a USDW.

Severity: Medium

Time of Event: Post-injection site care

Avoidance Measures: Care in well construction particularly with respect to cement placement.

Detection Methods: Monitoring of well pressure, temperature, specific conductivity. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

In general, the following will be undertaken:

- Notify the UIC Program Director within 24 hours, per 40 CFR 146.91(c)(3).
- Check the monitoring record in an attempt to identify cause.
- Log hole; check casing and borehole condition.
- Repair annulus seal or replace casing.
- Grout or install chemical sealant barrier in an adjoining well to block leak.
- Abandon well by completely closing it (seal with cement).
- Drill new well if necessary.
- Investigate whether USDW contamination occurred.
- If contamination is detected, identify and implement appropriate remedial actions (in consultation with the UIC Program Director).
- See Part 3.2 for details on further response.

Response Personnel: Drilling crew, supervising professionals, geotechnical subcontractors.

Equipment: Existing or newly mobilized drill rig, logging equipment, cement or casing as required.

Event/Description: Migration of CO_2 from injection zone through faults and fractures: This event could occur as a result of CO_2 migrating through existing, unknown faults or fractures or new, seismically induced faults or fractures.

Severity: Medium

Time of Event: Post-injection site care

Avoidance Measures: Extensive geophysical characterization has not identified faults or fractures.

Detection Methods: Early leak-detection monitoring in ACZ well; USDW aquifer monitoring in USDW well. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Assess cause by reviewing monitoring data.
- Conduct geophysical survey in an attempt to locate leaks.
- Intensify monitoring to determine whether migration continues.
- Lower reservoir pressure by removing liquids (water, brine, etc.) from the storage reservoir.
- Intersect the migration with extraction wells in the vicinity of the leak, withdraw and re-inject.
- Lower the reservoir pressure by promoting new pathways to access new volumes or strata in the storage reservoir.
- Create a hydraulic barrier by increasing reservoir pressure upstream of the leak.
- Inject grout or chemical sealant to block the leak.
- Extract CO_2 from the reservoir, and re-inject in a more suitable location.
- If contamination is detected, identify and implement appropriate remedial actions (in consultation with the UIC Program Director).
- See Parts 3.2 and 3.3 for details on further response.

Response Personnel: Onsite operating staff, supervising professionals, geophysical consultants.

Equipment: Newly mobilized drill rig, geophysics monitoring trucks.

Event/Description: Migration of CO_2 from injection zone through undocumented wells:
This event could occur as a result of undocumented wells serving as artificial conduits for fluid migration.

Severity: Medium to High depending on location.

Time of Event: Post-injection site care

Avoidance Measures: Drilling records and site walkthroughs were conducted. Only three wells were identified and none penetrate the confining zone.

Detection Methods: Early leak-detection monitoring in ACZ well; USDW aquifer monitoring in USDW well. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Assess the cause by reviewing monitoring data.
- Conduct a geophysical survey in an attempt to locate migration.
- Locate undocumented well(s).
- Repair leaking wells by re-plugging with cement.
- Repair leaking undocumented functional wells with well-recompletion techniques such as replacing casing and packers or re-cementing annular spaces.
- Plug and abandon wells that cannot be repaired.
- Create a hydraulic barrier by increasing reservoir pressure upstream of the leak.
- Install chemical sealant or grout barriers to block leaks.

- Identify and implement appropriate remedial actions (in consultation with the UIC Program Director).
- See Part 3.2 for details on further response.

Response Personnel: Drilling crew, supervising professionals, geotechnical subcontractors.

Equipment: Newly mobilized drill rig, logging equipment, cement or casing as required.

Event/Description: Migration of CO_2 from injection zone through failure of the confining zone (loss of containment): This event could occur as a result of CO_2 migrating through a compromised confining zone.

Severity: Medium

Time of Event: Post-injection site care

Avoidance Measures: Careful monitoring of pressure with periodic monitoring well sampling.

Detection Methods: Early leak-detection monitoring in ACZ well. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Verify integrity of well bore.
- Proceed to response for migration of CO_2 through well bore, through faults or fractures, or through undocumented abandoned wells according to location of migration and conduct groundwater remediation as required.
- See Part 3.2 for details on further response.

Response Personnel: Onsite operating staff, supervising professionals, geophysical consultants.

Equipment: Newly mobilized drill rig, geophysics monitoring trucks.

Event/Description: Monitoring well equipment malfunction: Failure or malfunction of well instrumentation that monitors wellhead pressure, temperature, or annulus pressure could result in false readings. In this event, the reservoir could become over-pressurized, possibly resulting in fractures in the confining zone.

Severity: Low; Possibly Medium if injection is not stopped and results in overpressurization

Time of Event: Post-injection site care

Avoidance Measures: Preventive maintenance of equipment.

Detection Methods: Pressure fall-off testing; monitoring of well pressure, temperature, specific conductivity. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).

- Repair monitoring instrumentation
- If repairs cannot be made within hours, then:
  - Initiate shutdown plan.
  - Repair or replace instrumentation.
  - Review monitoring records.
  - Perform reservoir injection tests to determine whether and where fracturing has occurred.
  - Completely close the well (seal with cement).
  - Drill new well if necessary.
  - Conduct groundwater remediation as required (in consultation with the UIC Program Director).
- See Part 3.6 for details on further response.

Response Personnel: Drilling crew, supervising professionals, geotechnical and instrument subcontractors.

Equipment: Newly mobilized drill rig and/or instrument repair truck.

Event/Description: Movement of brine from injection zone: This event could occur as a result of CO_2 migration along existing unknown faults or fractures, seismically induced faults or fractures, or failure of the confining zone (loss of containment).

Severity: Medium

Time of Event: Post-injection site care

Avoidance Measures: Careful monitoring of injected CO_2 pressure and distribution with periodic monitoring well sampling.

Detection Methods: Early leak-detection monitoring in ACZ well; USDW aquifer monitoring in USDW well. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Assess cause by reviewing monitoring data.
- Proceed to response for migration of CO_2 from injection zone through faults or fractures according to location of migration and conduct groundwater remediation as required.
- See Part 3.2 for details on further response.

Response Personnel: Onsite operating staff, supervising professionals, geophysical consultants.

Equipment: Newly mobilized drill rig, geophysics monitoring trucks.

Event/Description: Seismic event: If a seismic event were to occur inducing movement along faults or fractures, well leakage could occur.

Severity: Low to Medium depending upon quake magnitude and location

Time of Event: Post-injection site care

Avoidance Measures: The site is located in a seismically stable region.

Detection Methods: Passive seismic monitoring (microseismicity). See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Evaluate integrity of storage volume by gas pressure response and monitoring instrumentation.
- If a leak is detected, conduct a geophysical survey to locate new fracture zone.
- Intensify monitoring to determine whether migration is continuing over time.
- Lower reservoir pressure by removing liquids (water, brine, etc.) from the storage reservoir.
- Intersect the migration with extraction wells in the vicinity of the leak, withdraw, and re-inject.
- Lower the reservoir pressure by promoting new pathways to access new volumes or strata in the storage reservoir.
- Create a hydraulic barrier by increasing reservoir pressure upstream of the leak.
- Inject grout or chemical sealant to block leak.
- If contamination is detected, identify and implement appropriate remedial actions (in consultation with the UIC Program Director).
- Investigate the cause of the seismic event.
- Communicate the investigation and findings to the public (see Part 5).
- See Part 3.4 for details on further response.

Response Personnel: Onsite operations staff, drilling crew, supervising professionals, geotechnical contractors, mechanical contractors, as required.

Equipment: Newly mobilized drill rig, logging equipment, cement or casing, as required.

Event/Description: Groundwater/ USDW contamination: If there were a failure of the confining zone, failure of the injection or monitoring well, or if the plume encounters an undocumented AoR well, CO_2 or brine could reach groundwater, requiring remediation.

Severity: Medium to High depending upon location

Time of Event: Post-injection site care

Avoidance Measures: The entire CO_2 injection project is focused on preventing escape of CO_2 while sequestering the CO_2. The FutureGen oxy-combustion process incorporates gas-cleaning processes to remove at least 97% of contaminants, including mercury, prior to injection. Trace contaminants that might be entrained in CO_2 leaking into USDWs will pose inconsequential risk to the water quality.

Detection Methods: USDW aquifer monitoring in USDW well. See the Testing and Monitoring Plan for specific information.

Potential Response Actions:

- Notify the UIC Program Director within 24 hours of the incident, per 40 CFR 146.91(c)(3).
- Assess cause by reviewing monitoring data.
- Conduct a geophysical survey in an attempt to locate migration.
- Identify and implement appropriate remedial actions (in consultation with the UIC Program Director). If the leak cannot be located or while pursuing corrective measures for the leak, the following remedies may be considered:
  - Drill wells to intersect accumulations in groundwater, preferably near CO_2 aquifer entrance zones. Extract groundwater contaminated with gaseous or dissolved CO_2 water and treat ex situ.
  - Dissolve mineralized CO_2 (carbonates) in water and extract as a dissolved phase through an extraction well for ex situ air stripping.
  - Extract groundwater with metals mobilized by CO_2 and treat ex situ to remove metals and residual CO_2.
  - Use hydraulic barriers to immobilize and contain contaminants by deploying injection and extraction wells.
  - Deploy in situ chemical or biological treatment technologies to enhance biochemical degradation or stabilization of CO_2 -related contaminants.
  - Create a hydraulic barrier by increasing reservoir pressure upstream of a leak.
  - Place grouts or chemical sealant barriers to block leaks.
  - Provide individual water-treatment systems for each water-supply well user. The configuration for each ex situ treatment system will be determined by water chemistry. Applicable treatment technologies include but are not limited to aeration, pH adjustment, ion exchange, oxidizing filter, membrane filtration, etc.
- See Parts 3.2 and 3.3 for details on further response actions.

Response Personnel: Drilling crew, supervising professionals, geotechnical subcontractors, environmental or water-treatment contractors.

Equipment: Water-treatment equipment, new wellhead plumbing to and from water-treatment equipment, reagents for optional in situ treatment, newly mobilized drill rig, logging equipment, cement, or casing, as required.

3.1 Potential Response Actions to Loss of Injection Well Integrity

If a well blowout occurs during drilling, the blowout preventer will activate automatically. In the unlikely event of blowout preventer failure, heavy fluid would be injected in an attempt to regain hydrostatic control of the well column. If control could not be achieved, new wells that intersect pressurized accumulations of formation fluid and CO_2 could be drilled and pumped to relieve downhole pressures that are driving the release and cement could be injected to permanently close the well(s).

If a well blowout were to occur during injection operations, injection would be stopped immediately. One or more responses would then be implemented depending on the conditions encountered. The master valves would be closed. The well could be killed or permanently closed by pumping cement or heavy kill fluid down the well bore until the well stops flowing. If the flow continued, a heavier kill fluid could be pumped until the hydrostatic pressure of the fluid

column in the well stopped and contained the flow. If the release were to remain uncontrolled, new wells that intersect pressurized accumulations of formation fluid and CO_2 could be drilled and pumped to relieve downhole pressures that are driving the release.

A slow release of CO_2 could occur with a lesser failure of mechanical integrity for an injection well. Responses to such situations would involve equipment repair, temporary cessation of injection operations, and modification of injection equipment or procedures. If a leak occurred outside the outermost casing of an injection well, due to fractures of a confining formation in the immediate vicinity of the well string, localized application of grout sealant would be among the remedial actions considered. Implementation of such a remedy would entail drilling a new well into the affected area and injecting grout sealant into the formation where the formation geometry and properties facilitate lateral dispersion of the sealant into the compromised zone around the exterior of the CO_2 injection well.

Onsite drilling or operations personnel would correct the leakage, depending on when the leak occurs. Equipment used to correct the leak may involve a workover rig and wire-line tools, pipe, packers, bridge plug, and pressure-control equipment. In the extremely unlikely situation that a new well is required to relieve pressure, well casing, wellhead equipment, cement or mud equipment, and a secondary drill rig would be required.

3.2 Response Actions to Fluid Movement into USDWs

The immediate and primary responses to detection of injection-related fluid migration into any USDW would be similar to the remedies for a release via mechanical failure or confining formation failure: cessation of injection, notification, identification, and location of the source of the release, and implementation of corrective action to seal or stop the release. The location, size of the release, and access to the problem will control the particular course of remedial action. In the improbable event of an impact on water quality within the surficial aquifer system directly affecting water-supply wells, either point of use, withdrawal water treatment, or alternate water-supply remedies would be provided as appropriate.

3.3 Response Actions to Rapid and Unexpected Movement Beyond Modelled Predictions

If a rapid movement of injection-related fluids were detected or inferred outside of where they are predicted to be, the following response actions would be performed:

- Immediately notify the power plant, owner, and other designated project contacts.
- Notify the UIC Program Director within 24 hours of the incident per 40 CFR 146.91(c)(3).
- Project contacts will determine the severity of the event, based on the information available.

For a major or serious emergency:

- Cease injection according to the procedures in the permit.

- Shut in well (close flow valve).
- Communicate with local authorities to initiate evacuation plans, as necessary.
- Monitor injection well conditions to verify well status.
- Determine if there has been a loss of mechanical integrity of injection or monitoring wells.
- Identify and initiate remedial actions.

For a minor emergency:

- Monitor injection and monitoring well conditions to verify well status.
- Determine if there has been a loss of containment in the reservoir.
- Adjust injection rate as necessary to maintain containment in reservoir.

Once the source and pathway of the release were identified, remedial actions appropriate for the situation would be implemented as described above.

3.4 Response Actions to a Seismic Event

A tiered approach and response will be taken based on event magnitude and proximity to the storage site.

After a seismic event has been identified, a decision must be made regarding the level of impact a given event could have on storage site operations, whether a response is required, and what the appropriate response will be. This decision and response framework will consist of an automated event location and magnitude determination, followed by an alert for a technical review in order to reduce the likelihood of false positives.

Identification of events with sufficient magnitude or that are located in a sensitive area (caprock) should be used as input for decisions that guide the adaptive strategy. Seismic events that affect the operations of CO_2 injection can be divided into two groups/tiers: 1) events that create felt seismicity at the surface and may lead to public concern or structural damage, and 2) events not included in group one, but that might indicate failure or impending failure of the caprock. The operational protocol for responding to events in group one (Tier I) will follow a "traffic light" approach (modified after Zoback 2012; National Research Council 2012) that uses three operational states:

1. Green: Continue normal operations unless injection-related seismicity is observed with magnitudes greater than $M = 2$.
2. Yellow: Injection-related seismic events are observed with magnitude $2 < M < 4$. The injection rate will be slowed and the relationship between rate and seismicity will be studied to guide mitigation procedures, including reduced operational flow rates. The FutureGen Alliance will notify the EPA UIC Program Director of any such event within 24 hours providing information on the status of the storage site.
3. Red: Magnitude 4 or greater seismic events are observed that are related to CO_2 injection. Injection operations will stop and an evaluation will be performed to determine the

source and cause of the ground motion. The FutureGen Alliance will notify the EPA UIC Program Director of any such event within 24 hours providing information on the status of the storage site.

Tier II operational responses to an event or collection of events that indicate possible failure of the primary confining zone may include initiation of supplemental adaptive monitoring activities, injection rate reduction in one or more injection laterals, or pressure reduction using brine extraction wells.

3.5 Response Actions to a Natural Disaster

If a natural disaster occurs that affects normal operation of the injection well, the FutureGen Alliance will perform the following response actions:

- Immediately notify the power plant, owner, and other designated project contacts.
- Notify the UIC Program Director within 24 hours of the incident per 40 CFR 146.91(c)(3).
- Project contacts will determine the severity of the event, based on the information available,

For a major or serious emergency:

- Cease injection according to the procedures in the permit.
- Shut in well (close flow valve).
- Communicate with local authorities to initiate evacuation plans, as necessary.
- Monitor injection well conditions to verify well status.
- Determine if there has been a loss of mechanical integrity of injection and monitoring wells.
- Identify and initiate remedial actions.

For a minor emergency:

- Monitor injection well conditions to verify well status.
- Determine if there has been a loss of mechanical integrity of a single barrier in an injection well and/or in any monitoring wells.
- Initiate notification in accordance with permit conditions
- Identify and initiate remedial actions, as needed.

3.6 Response Actions to Monitoring Equipment Failure

If a device malfunctions and requires repair, a backup monitoring scheme will be initiated. This may include temporary use of manual measurements to compensate for non-functioning equipment or the replacement of equipment with spares. Replacement sensors and repair parts will be maintained onsite to facilitate repair.

Part 4: Emergency Contacts

4.1 FutureGen and Local Agency Notification

If a CO_2 release outside of the injection zone were detected, the Emergency Coordinator and Emergency Operations Manager on duty would be notified immediately. The Emergency Coordinator will be responsible for notifying offsite emergency agencies and resources. If the Emergency Coordinator is not available, the Emergency Operations Manager will contact outside emergency response organizations (listed in Table 3) appropriate for the situation. The EPA Region 5 UIC Program Director will also be notified within 24 hours.

Table 3. Outside Emergency Response

Agency	Location	Phone
Fire	Alexander, IL	911 217-478-3341
Ambulance	Jacksonville, IL	911 217-245-7540
Passavant Area Hospital	Jacksonville, IL	217-245-9541
State Police		217-786-7101
Illinois Emergency Management Agency	Springfield, IL	217-782-7860
Jacksonville/Morgan County Emergency Services & Disaster Agency	Jacksonville, IL	217-479-4616
Sheriff	Jacksonville, IL	217-245-4143

4.2 Injection Operations Staff

Monitoring, control, and routine maintenance of the injection operations at the FutureGen 2.0 storage site in Morgan County will be the responsibility of the Injection Operations Staff. The staff is expected to include the minimum positions as listed in Table 4.

Table 4. Operations Staff Descriptions		
Position	Function	Qualifications
Emergency Coordinator	Responsible for notification of offsite support agencies in accordance with written procedures. Responsible for coordination and overseeing contact with the media.	Trained in the Communications Plan and Emergency Notification Procedures requirements as contained in the ERRP.
Emergency Operations Manager	Serves as the Alliance Emergency Response Manager responsible for the overall management of the Alliance Incident Response Team. Manages facility operations and personnel during an emergency and is responsible for implementation of appropriate emergency procedures and their follow-up.	Trained in the requirements of the ERRP and facility operations.
Senior Geologist/Geophysicist	Responsible for injection operation, maintenance, and monitoring. Lead incident response manager regarding injection and storage zone operation at the facility.	Graduate degree in geology/geophysics with at least 5 years of experience in geologic reservoir dynamics and relevant monitoring interpretation.
Geologist/Geophysicist	Professional associate assisting in operation, maintenance, and monitoring of injection process. Conducts routine data management and interpretation. Assists in implementing response actions, particularly in regard to injection zone integrity.	Undergraduate degree in geophysics or geology with specialization in hydrology/fluid mechanics.
Operations Engineer	Manages mechanical and fluid management operation of the injection wells, annulus pressure control system, and well head piping systems. Maintains and repairs injection-related equipment, including valves, instruments, piping. Assists in mechanical and electronic control of injection process.	Undergraduate degree in engineering, preferably related to mechanical, chemical or process control. At least 2 years of direct hands on operation and service of equipment and instruments related to pressurized well systems and wellhead controls.

4.3 Agency Notification

Agency emergency response services will also be provided by the Illinois State Geological Survey, Illinois Department of Natural Resources, and U.S. Geological Survey Water Resources for Illinois. In addition to the emergency contact lists, a list of contacts for state agencies having jurisdiction within the AoR is presented in Table 5. At this time, there are no federally recognized Native American Tribes located within the AoR or the State of Illinois (http://www.ncsl.org/research/state-tribal-institute/list-of-federal-and-state-recognized-tribes.aspx). If a federally recognized Native American Tribe exists in the AoR or the State of Illinois at the time of a site emergency, it will be notified of the site emergency at that time.

Table 5. Agency Emergency Response			
Agency	Person	Position	Address and Phone
USEPA Region 5	Jeffrey McDonald	UIC Program Contact	Chicago, IL (312) 353-6288
Illinois State Geological Survey	Randall A. Locke, II	Environmental Geochemist and Head Geochemistry Section	Room 387, Natural Resources Building 15 E. Peabody, University of Illinois Champaign, IL 61820 217-333-3866
Illinois Department of Natural Resources	-	Office of Law Enforcement	One Natural Resources Way Springfield, IL 62702 217-785-8407
U.S. Geological Survey Water Resources for Illinois	-		1201 W. University Avenue, Suite 100 Urbana, IL 61801 217-328-8747

Part 5: Emergency Communications Plan

Prior to the start of CO_2 injection operations, the FutureGen Alliance will formally communicate with landowners living adjacent to the storage site to provide information about the nature of the operations, potential risks, and appropriate response approaches under various emergency scenarios.

An emergency contact list will be maintained during the life of the project. In the event of an emergency, the Emergency Coordinator will start the call tree and make sure the appropriate personnel are contacted.

Emergency communications with the public will be handled by the FutureGen Alliance. The Emergency Coordinator is a FutureGen Alliance-designated individual who will coordinate responses to the media.

The FutureGen Alliance will communicate to the public about any event that requires an emergency response to ensure that the public understands what happened and any environmental or safety implications. The amount of information, timing, and communications method(s) will be appropriate to the event, its severity, whether any impacts to drinking water or other environmental resources occurred, any impacts to the surrounding community, and their awareness of the event.

The FutureGen Alliance will describe what happened and the location of any emergency event (e.g., at the injection well or wells; within the AoR; at a monitoring well location), any impacts to the environment or other local resources, how the event was investigated, what responses were taken, and the status of the response. For responses that occur over the long-term (e.g., ongoing cleanups), the FutureGen Alliance will provide periodic updates on the progress of the response action(s).

If a seismic event occurs, the FutureGen Alliance will provide information about whether the event was naturally occurring or induced by the injection; whether any damage to the well or other structures in the area occurred; the investigative process; and what responses, if any, were taken by the FutureGen Alliance or others.

The FutureGen Alliance will also communicate with entities who may need to be informed about or take action in response to the event, including local water systems, CO_2 source(s) and pipeline operators, land owners, and Regional Response Teams (as part of the National Response Team). Response personnel will receive information including but not limited to:

- The location of the injection and monitoring wells (coordinates and directions to the storage site);
- A map of the area including the location of the wells, nearby population centers, and sensitive environments;
- Schematics and diagrams of the facility and the well, including the location of monitoring equipment and emergency shutoffs.

In the event that anyone else is contacted to comment on any situation deemed an "emergency," the media contact should be directed to the FutureGen Alliance -designated individual, who will oversee all media communications with the public (through either interview, press release, Web posting, or other) in the event of an emergency situation related to the injection project.

Part 6: Plan Review

The FutureGen Alliance will annually review and, as necessary, revise its ERRP. In addition, the FutureGen Alliance will review and, as necessary, revise its ERRP within one year of an AoR reevaluation or within one year after any significant changes to the facility such as the addition of injection or monitoring wells. Any revised plan will be submitted to the EPA UIC Program Director for approval. If, after a review, the FutureGen Alliance determines that no revisions are necessary, the FutureGen Alliance will submit its determination and the basis for such a determination to the EPA UIC Program Director.

Part 7: Staff Training and Exercise Procedures

All operations employees will receive training related to health and safety, operational procedures, and emergency response according to the roles and responsibilities of their work assignments. Initial training will be conducted by, or under the supervision of, a project operations manager or a designated representative. Trainers will be thoroughly familiar with the Operations Plan and ERRP.

Facility personnel will participate in annual training that teaches them to perform their duties in ways that prevent the discharge of CO_2. The training will include familiarization with operating procedures and equipment configurations appropriate to the job assignment, as well as

emergency response procedures, equipment, and instrumentation. New personnel will be instructed before beginning their work.

Refresher training will be conducted at least annually for all operations personnel. Monthly briefings will be provided to operations personnel according to their respective responsibilities and will highlight recent operating incidents, actual experience in operating equipment, and recent storage reservoir monitoring information.

Only personnel who have been properly trained will participate in drilling, construction, operations, and equipment repair at the storage site. A record including the person's name, date of training, and the instructor's signature will be maintained.

ATTACHMENT G: CONSTRUCTION DETAILS

Facility Information

Facility Name: FutureGen 2.0 Morgan County CO_2 Storage Site
IL-137-6A-0001 (Well #1)

Facility Contacts: Kenneth Humphreys, Chief Executive Officer,
FutureGen Industrial Alliance, Inc., Morgan County Office,
73 Central Park Plaza East, Jacksonville, IL 62650, 217-243-8215

Location of Injection Well: Morgan County, IL; 26–16N–9W; 39.80111°N and 90.07491°W

Borehole and Casing and Tubing Program for the Horizontal CO_2 Injection Wells

Casing String	Casing Depth, TVD (ft bgs)	Casing Depth, MD (ft bgs)	Borehole Diameter (in.)	Casing Outside Diameter (in.)	Coupling Outside Diameter (in.)	Casing Material (weight/grade/ connection)	String Weight in Air (lb)
Conductor	140	140	30	24	25.198	140 lb/ft, K-55, MTC	19,600
Surface	570	570	20	16	17	84 lb/ft, K-55, BTC	47,880
Intermed.	0-3,150	3,150	14.75	10.75	11.25	51 lb/ft, K-55, BTC	160,650
Long String	0-3,398	0-3,400	9.5	7	7.656	29 lb/ft, N-80, BTC	98,600
	3,398-4,030	3,400-7,004		7	7.669	29 lb/ft, P-110, Premium[a]	91, 466
Tubing	3,819.1	3,949	NA	3.5	4.5	9.3 lb/ft, N-80, EUE	36,270

(a) A corrosion-resistant alloy such as 13 Cr (13 percent chromium) having strength properties equal to or greater than 29-lb/ft P-110 and having premium connections will be used for this section. Perforated interval.
EUE = external upset end; TVD = total vertical depth; MD = measured depth.

Properties of Well Casing and Tubing Materials

Casing String	Casing Material (weight/grade/ connection)	Casing Outside/Inside/ Drift Diameter (in.)	Yield (ksi)	Tensile (ksi)	Internal (Burst) Yield (psi)	Collapse (psi)	Tension (1,000 lb) Body (B) Joint (J)	Compression (1,000 lb)
Conductor	140 lb/ft, K-55, MTC	24/22.938/22.751	55	95	2,130	530	(1,967)	1,139
Surface	84 lb/ft, K-55, BTC	16/15.010/14.823	55	95	2,980	1,410	1,326 (B) 1,499 (J)	868
Intermediate	51 lb/ft, K-55, BTC	10.75/9.85/9.694	55	95	4,030	2,700	801 (B) 1,042 (J)	604
Long String	29 lb/ft, N-80, BTC	7.0/6.184/6.059	80	110	8,100	7,020	676 (B) 746 (J)	597
	29 lb/ft, P-110, BTC	7.0/6.184/6.059	110	125	11,220	8,530	929 (B) 955 (J)	488

Casing String	Casing Material (weight/grade/ connection)	Casing Outside/Inside/ Drift Diameter (in.)	Yield (ksi)	Tensile (ksi)	Internal (Burst) Yield (psi)	Collapse (psi)	Tension (1,000 lb) Body (B) Joint (J)	Compression (1,000 lb)
Tubing	9.3 lb/ft, N-80, EUE	3.5/2.992/2.867	80	100	10,160	10,530	207.2 (B) 207.2 (J)	207.2

MTC = metal to metal seal threaded and coupled; BTC = buttress thread coupling; ksi = kilopound per square inch

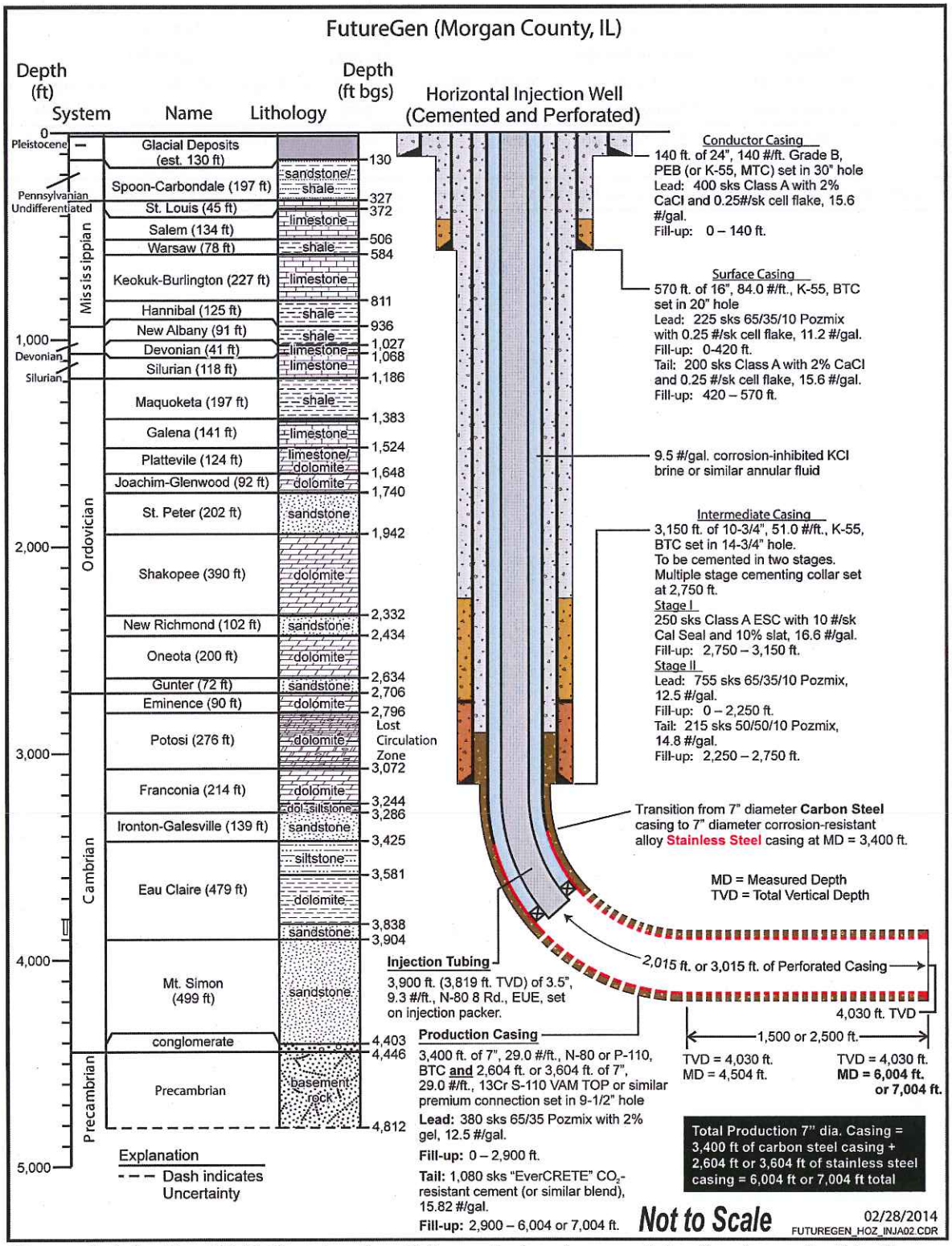

Figure 1. Injection Well Construction Schematic (geology and depths shown in this diagram are based on site-specific characterization data obtained from the FutureGen 2.0 Stratigraphic Well).

Pre-Injection Testing Plan

The pre-operational formation testing program will be implemented to obtain an analysis of the chemical and physical characteristics of the injection zone and confining zone(s) that meets the testing requirements of 40 CFR 146.87 and well construction requirements of 40 CFR 146.86. The pre-operational formation testing program will include a combination of logging, coring, formation hydrogeologic testing (e.g., a pump test and/or injectivity tests), and other activities during the drilling and construction of the CO2 injection well, monitoring well(s), and the FutureGen 2.0 stratigraphic well. The pre-operational testing program will determine or verify the depth, thickness, mineralogy, lithology, porosity, permeability, and geomechanical information of the Mount Simon Sandstone (CO_2 injection zone), the overlying Eau Claire Formation (confining zone), and other relevant geologic formations. In addition, formation fluid characteristics will be obtained from the Mount Simon Sandstone to establish baseline data against which future measurements may be compared after the start of injection operations.

The results of the testing activities will be documented in a report and submitted to the U.S. Environmental Protection Agency (EPA) after the well drilling and testing activities have been completed but before the start of CO_2 injection operations. Before drilling the injection wells, a vertical pilot hole will be drilled through the Mount Simon Formation at the injection well location to collect pre-operational characterization and testing data for the injection wells. After completing the characterization and testing in the vertical pilot hole, the borehole will be plugged (cemented) from total depth to the kick-off point (approximate depth of 3,200 ft bgs) and converted to one of the horizontal injection wells. Additional selected pre-operational testing will be conducted within one or more lateral boreholes. The permittee shall submit to the Director for review all pre-injection testing procedures for logging, sampling and testing required by 40 CFR 146.87 no later than 30 days prior to performing the first test, along with the schedule for such testing. The permittee shall submit any changes to the schedule 30 days prior to the next scheduled test. Testing shall not proceed without the Director's approval of the schedule.

Wireline Logging

Open-borehole logs will be run to obtain densely spaced, in situ, structural, stratigraphic, physical, chemical, and geomechanical information for the Mount Simon Sandstone, the Eau Claire confining zone, and other key formations. Open-borehole characterization logs will be obtained at the surface casing point, the intermediate casing point, and at the long-string casing point (i.e., total borehole depth) in the vertical pilot borehole. Open-borehole wireline logs will not be run in the 30-in.-diameter conductor casing borehole, because logging tools are not suited for this large-diameter hole size. Open-borehole logs for the surface, intermediate, and long-string sections of the well will include a suite of standard logs including gamma ray, formation density, neutron porosity, resistivity, spontaneous potential, photoelectric factor, and caliper. In addition, one or more specialized logs may also be run on the long-string section of the well, including for example, spectral gamma, sonic, resistivity-based and/or acoustic-based image, nuclear magnetic resonance, and elemental capture spectroscopy.

Demonstration of Mechanical Integrity

This table summarizes the MITs and pressure fall-off tests to be performed prior to injection:

Class VI Rule Citation	Rule Description	Test Description	Program Period
[40 CFR 146.89(a)(1)]	MIT - Internal	Annulus Pressure Test	Prior to Operation
[40 CFR 146.87(a)(4)]	MIT - External	Temperature Log	Prior to Operation
[40 CFR 146.87(e)(1)]	Testing prior to operating	Pressure Fall-off Test	Prior to Operation

Additional information about testing procedures is addressed in the QASP attached to the Testing and Monitoring Plan of this permit. A successful test will be confirmed when casing pressure holds for one hour with less than 3% loss or gain in pressure.

ATTACHMENT H: FINANCIAL ASSURANCE DEMONSTRATION

Facility Name: FutureGen 2.0 Morgan County CO_2 Storage Site
IL-137-6A-0001 (Well #1)

Facility Contacts: Kenneth Humphreys, Chief Executive Officer,
FutureGen Industrial Alliance, Inc., Morgan County Office,
73 Central Park Plaza East, Jacksonville, IL 62650, 217-243-8215

Location of Injection Well: Morgan County, IL; 26–16N–9W; 39.80111°N and 90.07491°W

The FutureGen Alliance is providing financial responsibility pursuant to 40 CFR 146.85. FutureGen is using a **trust fund** to cover the costs of: corrective action, emergency and remedial response, injection well plugging, and post-injection site care and site closure.

The estimated costs of each of these activities, as provided in FutureGen's permit application, are presented in Table 1:

Table 1. Cost Estimates for Activities to be Covered by Financial Responsibility

Activity	Estimated Cost (Millions, 2012$)
Performing Corrective Action on Deficient Wells in AoR	$0.62
Plugging Injection Wells	$2.7
Post-Injection Site Care	$18.3
Site Closure	$3.4
Emergency and Remedial Response	$26.7
Note: Values in this table are rounded. For exact costs used to determine the value of the Trust Fund, refer to Table 2.	

The instrument values included in this document are based on cost estimates provided during the permit application and review process. These values are subject to change during the course of the project to account for inflation of costs and any changes to the project that affect the cost of the covered activities. If the cost estimates change, FutureGen will adjust the value of the financial instruments.

Trust Fund

The Permittee is providing financial responsibility for the cost of corrective action (as described in Attachment B of this permit), injection well plugging (per Attachment D of this permit), and post-injection site care and site closure (per Attachment E), and Emergency and Remedial Response (per Attachment F) via a trust fund valued at $51.7 million and established through the

attached Trust Agreement. The U.S. Bank National Association is the Trustee of the trust fund. The trust fund will be funded in a "phased approach" to account for the fact that certain covered activities will not be incurred until injection begins. For example, resources to cover the cost of plugging the well need to be in place prior to when drilling commences; however certain activities (e.g., corrective action that is performed on a phased basis, post-injection site care and monitoring, and site closure) will not need to be covered until closer to when injection begins.

Table 2 breaks down the activities and estimated costs according to when the payments would be required (i.e., at least 7 days after final permit issuance, at the start of the "Pre-Injection" phase, and within 1 year of final permit issuance or at least 7 days prior to the start of the "Injection and Post-Injection Phase," whichever comes earlier), within two years of final permit issuance.

Table 2. Payment Schedule for Trust Fund

Funding	Activities	Costs (millions of dollars)	Amount to be Added Before Start of Phase (millions of dollars)
Pre-Injection (*within 7 days of final permit issuance*)	Plugging Injection and Monitoring Wells	2.723	2.723
	Emergency and Remedial Response	6.1	6.1
Injection and Post-Injection (*within 1 year of final permit issuance, or at least 7 days prior to injection, whichever comes first*)	AoR and Corrective Action	0.623	22.345
	Post-Injection Site Care (Includes Monitoring)	18.32	
	Closure	3.402	
Injection and Post-Injection (*within 2 years of final permit issuance*)	Emergency and Remedial Response	20.6	20.6

AMENDED AND RESTATED TRUST AGREEEMENT

Amended and Revised Trust Agreement (Agreement), entered into as of March 28, 2014, by and between the FutureGen Industrial Alliance, Inc. (Alliance), a non-profit 501(c)(3) corporation organized under the laws of the State of Delaware, the Grantor, and U.S. Bank National Association, a national banking association, the Trustee.

Whereas, the United States Environmental Protection Agency (EPA), an agency of the United States Government, has established certain regulations applicable to the Grantor requiring that an owner or operator of an injection well shall provide assurance that funds will be available when needed for corrective actions, injection well plugging, post-injection site care and site closure, or emergency and/or remedial response of the FutureGen 2.0 Class VI (carbon dioxide [CO_2] geologic sequestration) injection wells,

Whereas, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facilities identified herein,

Whereas, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this agreement, and the Trustee is willing to act as trustee,

Now, therefore, the Grantor and the Trustee agree as follows:

Section 1. Definitions as used in this Agreement:

(A) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.

(B) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.

(C) "Facility" or "activity" means any underground injection well or any other facility or activity that is subject to regulation under the Underground Injection Control Program.

(D) EPA Water Division Director means the EPA Regional Water Division Director for Region V or an authorized representative.

Section 2. Identification of Facilities and Cost Estimates. This Agreement pertains to the facilities and cost estimates identified on attached Schedule A.

Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a CO_2 Storage Trust Fund (Fund) to satisfy the financial responsibility demonstration under the Class VI Underground Injection Control (UIC) regulations (40 CFR §§ 146.81 – 146.95) for the FutureGen 2.0 Project.. The Grantor and the Trustee acknowledge that the purpose of the Fund is to fulfill the Grantor's corrective action, injection well plugging, post-injection site care and site

closure, and emergency and/or remedial response obligations described at 40 CFR §§ 146.84 (Area of review and corrective action), 146.92 (Injection well plugging), 146.93 (Post-injection site care and site closure), and 146.94 (Emergency and remedial response), respectively. All expenditures from the Fund shall be to fulfill the legal obligations of the Grantor under such regulations, and not any obligation of EPA. The Grantor and the Trustee intend that no independent third-party have access to the Fund except as herein provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any responsibilities of the Grantor established by EPA regulations.

Section 4. Payment for Corrective Action, Injection Well Plugging, Post-Injection Site Care and Site Closure, and Emergency and/or Remedial Response. The Trustee shall make payments from the Fund only as the EPA Water Division Director shall direct, in writing, to provide for the payment of the costs of corrective actions, injection well plugging, post-injection site care and site closure, and/or emergency and remedial response of the injection wells covered by this Agreement. The Trustee shall use the Fund to reimburse the Grantor or other persons selected by the Grantor to perform work when the EPA Water Division Director advises in writing that the work will be or was necessary for the fulfillment of the Grantor's corrective actions, injection well plugging, post-injection site care and site closure, and/or emergency and remedial response obligations described at 40 CFR 146.84, 146.92, 146.93, and 146.94, respectively. All expenditures from the Fund shall be to fulfill the legal obligations of the Grantor under such regulations, and not any obligation of EPA, as the Agency is not a beneficiary of the Trust. The EPA Water Division Director may advise the Trustee that amounts in the Fund are no longer necessary to fulfill the Grantor's obligations under 40 CFR 146.85 and that the Trustee may refund the remaining funds to the Grantor. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

Section 5. Payments Comprising the Fund. Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee. Schedule C provides the amounts and timing of the Alliance payments (i.e., the pay-in periods).

Section 6. Trustee Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge its duties with respect to the trust fund solely in the interest of the Grantor and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; *except that:*

(A) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a–2.(a), shall not be acquired or held, unless they are securities or other obligations of the federal or a state government;

(B) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the federal or state government; and

(C) The Trustee is authorized to hold cash awaiting investment or distribution un-invested for a reasonable time and without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:

(A) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and

(B) To purchase shares in any investment company, except as specified in writing by the owner or operator, registered under the Investment Company Act of 1940, 15 U.S.C. 80a–1 *et seq.*, including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote shares in its discretion.

Section 8. Express Powers of Trustee. Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(A) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;

(B) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(C) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depositary with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(D) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the federal or state government; and

(E) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. The Trustee shall annually, at least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the EPA Water Division Director a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the EPA Water Division Director shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement of any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

Section 13. Successor Trustee. The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the EPA Water Division Director, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by the EPA Water Division Director to the Trustee shall be in writing, signed by the EPA Water Division Director, and the Trustee may rely on these instructions to the extent permissible by law. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or EPA hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or EPA, except as provided for herein.

Section 15. Notice of Nonpayment. The Trustee shall notify the Grantor and the EPA Water Division Director, by certified mail within 10 days following the expiration of the 30-day period after the anniversary of the establishment of the Trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to send a notice of nonpayment.

Section 16. Amendment of Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, with the concurrence of the EPA Water Division Director, or by the Trustee and the EPA Water Division Director if the Grantor ceases to exist. Provided, however, that EPA may not be named as a beneficiary of the Trust, receive funds from the Trust, or direct that Trust funds be paid to a particular entity selected by EPA.

Section 17. Cancelation, Irrevocability and Termination. Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, with the concurrence of the EPA Water Division Director, or by the Trustee and the EPA Water Division Director if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor, or if the Grantor is no longer in existence, at the written direction of the EPA.

Section 18. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense. EPA does not indemnify either the Grantor or the Trustee due to the restrictions imposed by the Anti-Deficiency Act, 31 U.S.C. 1341. Rather, any claims against EPA are subject to the Federal Tort Claims Act, 28 U.S.C. 2671, 2680.

Section 19. Choice of Law. This Agreement shall be administered, construed, and enforced according to the laws of the State of Illinois with regard to claims by the Grantor or Trustee. Claims involving EPA are subject to federal law.

Section 20. Interpretation. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

Section 21. Integration. This Agreement supersedes the previously executed Trust Agreement between the parties hereto dated March 20, 2014.

In Witness Whereof the parties have caused this Agreement to be executed by their respective officers duly authorized and attested as of the date first above written.

Signature of Grantor's Authorized Representative: Kenneth K. Humphreys, Jr.
Name of Grantor's Authorized Representative: Kenneth K. Humphreys, Jr.
Title: Chief Executive Officer

Attest:

Signature: Carole Plowfield
Name of Attester: Carole Plowfield
Title of Attester: Executive Administrator

Certification of Acknowledgement of Notary:

MATNITA A. GREEN NOTARY PUBLIC DISTRICT OF COLUMBIA MY COMMISSION EXPIRES 3 31 2018

District of Columbia : SS
Subscribed and Sworn to before me
this 27th day of March, 2014
Notary Public, D.C.
My commission expires 3/31/2018

Signature of Trustee's Authorized Representative:
Name of Trustee's Authorized Representative: Thomas S. Maple III
Title: Vice President

Attest:

Signature:
Name of Attester: Judith L. Foley
Title of Attester: Vice President

Certification of Acknowledgement of Notary:

JASON ADAM FELIX
NOTARY PUBLIC - MINNESOTA
My Commission Expires Jan. 31, 2016

Schedule A: Facilities and Cost Estimates to Which the Trust Agreement Applies

Because the four injection wells covered by this Agreement will be similarly constructed and drilled from a single well pad, the CO_2 injected through the four wells will form one co-mingled CO_2 plume. Therefore, funds noted in the table below apply to all four injection wells as one integrated facility.

Facility	Corrective Action ($ million)	Injection Well Plugging ($ million)	Post-injection Site Care and Site Closure ($ million)	Emergency and Remedial Response ($ million)
EPA Identification Number IL-137-6A-0001 Morgan County Class VI UIC Well #1 73 Central Park Plaza E Jacksonville, IL 62650	$0.623	$2.723	$21.722	$26.7
EPA Identification IL-137-6A-0002 Morgan County Class VI UIC Well #2 73 Central Park Plaza E Jacksonville, IL 62650				
EPA Identification Number IL-137-6A-0003 Morgan County Class VI UIC Well #3 73 Central Park Plaza E Jacksonville, IL 62650				
EPA Identification Number IL-137-6A-0004 Morgan County Class VI UIC Well #4 73 Central Park Plaza E Jacksonville, IL 62650				

Schedule B: Trust Fund Property

Because the four injection wells covered by this Agreement will be similarly constructed and drilled from a single well pad, the CO_2 injected through the four wells will form one co-mingled CO_2 plume. Therefore, funds noted in the table below apply to all four injection wells as one integrated facility.

Facility	Funding Value for Activities
EPA Identification Number IL-137-6A-0001 Morgan County Class VI UIC Well #1 73 Central Park Plaza E Jacksonville, IL 62650	$51,768,000.00
EPA Identification Number IL-137-6A-0002 Morgan County Class VI UIC Well #2 73 Central Park Plaza E Jacksonville, IL 62650	
EPA Identification Number IL-137-6A-0003 Morgan County Class VI UIC Well #3 73 Central Park Plaza E Jacksonville, IL 62650	
EPA Identification Number IL-137-6A-0004 Morgan County Class VI UIC Well #4 73 Central Park Plaza E Jacksonville, IL 62650	

Schedule C: Pay-in Periods

The CO_2 Trust Fund will be funded according to when the financial risks are incurred on the FutureGen 2.0 Project in four distinct activities:

- **Pre-Injection:** Once an injection or monitoring well is drilled, plugging costs will eventually need to be incurred. Therefore, the trust account will be funded with the cost of plugging injection and monitoring wells prior to drilling the wells. The Alliance's estimated cost of this activity is $2.723 million.
- **Injection:** As soon as injection of CO_2 begins in the Class VI well(s), certain activities will necessarily need to occur (corrective action that is performed on a phased basis, post-injection site care and monitoring, and site closure). Therefore, the trust account should be funded with the costs associated with these activities. The Alliance's estimated cost of this activity is $22.345 million.
- **Post-Injection:** While all costs must be covered at the start of the post-injection phase, the trust account may phase out these costs as the activities are completed (with approval from the EPA Water Division Director). For example, once wells have been plugged, their corresponding plugging costs may be subtracted from the total value of the trust account.
- **Emergency and remedial response:** Prior to authorization from EPA to begin injecting CO_2 under the Class VI well permit(s), the Alliance must be prepared to undertake any emergency or remedial response actions, although such actions are unlikely to be needed. The Alliance estimated the cost of the most severe incident to be $6.1 million, which is the amount that will be placed into the trust fund prior to drilling the injection well(s). However, to ensure that sufficient funds will be available in the highly unlikely event that multiple incidents occurred over the entire period of injection and post-injection operations, the Alliance will add $20.6 million to the trust fund for emergency and remedial response (for a total of $26.7 million) prior to EPA's authorization of the start of CO_2 injection.

Within seven calendar days after the issuance of final Class VI UIC permits for the Morgan County injection wells, the Alliance will ensure that $2.723 million is in the CO_2 Trust Fund to cover the cost of plugging injection and monitoring wells in the Pre-Injection Period. In addition, the Alliance will ensure that $6.1 million is in the CO_2 Trust Fund to cover the cost of emergency and remedial response during the construction period and prior to the start of CO_2 injection.

On or before the one-year anniversary of the issuance of the final Class VI UIC permits for the Morgan County injection wells, and at least seven calendar days prior to EPA authorization for the start of CO_2 injection in any of the wells (whichever is earlier), the Alliance will ensure that an additional $22.345 million is in the CO_2 Trust Fund to cover the costs of the Injection and Post-Injection Periods. The total value of the trust at the beginning of the Injection Period will be

$31.168 million. An additional $20.6 million will be added on or before the two-year anniversary of the issuance of the final Class VI UIC permit(s) for the Morgan County injection well(s), completing the phase-in of financial responsibility payments for emergency and remedial response. The Alliance may also elect to substitute another mechanism to demonstrate financial responsibility for emergency and remedial response for the injection and post-injection phases. If EPA approves such a substitution, this Agreement will be amended accordingly.

These amounts are based on the third-party cost estimate submitted by the Alliance in its *Supporting Documentation: Underground Injection Control Class VI Injection Well Permit Applications for FutureGen 2.0 Morgan County Wells 1, 2, 3, and 4,* dated March 2013 (Appendix C) and on EPA's independent evaluation of the cost estimates. These costs are subject to review and approval by EPA and may be adjusted for inflation or any change to the cost estimate in accordance with 40 CFR § 146.85(c)(2).

Table 1 shows the activities and estimated costs according to when the payments would be required (i.e., at the start of the "Pre-Injection" phase or at the start of the "Injection and Post-Injection Phase").

Table 1: Payment Schedule

Funding	**Activities**	**Costs (millions of dollars)**	**Amount to be Added Before Start of Phase (millions of dollars)**
Pre-Injection (*within 7 days of final permit issuance*)	Plugging Injection and Monitoring Wells	2.723	2.723
	Emergency and Remedial Response	6.1	6.1
Injection and Post-Injection (*within 1 year of final permit issuance, or at least 7 days prior to injection, whichever comes first*)	AoR and Corrective Action	0.623	22.345
	Post-Injection Site Care (Includes Monitoring)	18.32	
	Closure	3.402	
Injection and Post-Injection (*within 2 years of final permit issuance*)	Emergency and Remedial Response	20.6	20.6

Exhibit A FutureGen Industrial Alliance, Inc. Designee Authorized to Instruct Trustee

Kenneth K. Humphreys, Jr.
Chief Executive Officer
FutureGen Industrial Alliance, Inc.
73 Central Park Plaza East
Jacksonville, Illinois 62650
217/243-8215

The FutureGen Industrial Alliance, Inc., as Grantor, may designate other designees by amendment to this Exhibit.

ATTACHMENT I: STIMULATION PROGRAM

Facility Name: FutureGen 2.0 Morgan County CO_2 Storage Site
IL-137-6A-0001 (Well #1)

Facility Contacts: Kenneth Humphreys, Chief Executive Officer,
FutureGen Industrial Alliance, Inc., Morgan County Office,
73 Central Park Plaza East, Jacksonville, IL 62650, 217-243-8215

Location of Injection Well: Morgan County, IL; 26–16N–9W; 39.801110266°N and 90.07491°W

The need for stimulation to enhance the injectivity potential of the Mount Simon Sandstone is not anticipated at this time. The need for stimulation will be determined once the characterization data from the CO_2 injection wells are available and have been evaluated (i.e., results of geophysical logs, core analyses, hydrogeologic testing). If it is determined that stimulation techniques are needed, a stimulation plan will be developed and submitted to EPA Region 5 for review and approval prior to conducting any stimulation.