Report on Futurepast's Verification Engagement with

Isometric

Relative to the

Charm Industrial Great Plains Bio-Oil Sequestration Project

Report Date: 2024-07-26

Contentsb

Key Project Data

Project Title	Charm Industrial Great Plains Bio-Oil Sequestration
Project ID	7BDE
PDD File Name	V 1.5 Charm Industrial G.P. Bio Oil Sequestration PDD.docx
PDD Version	1.5
PDD Issue Date	2024-05-30
Project Location	Port Cartier, QC; El Dorado, KS; Hutchison, KS
Project Proponent	Charm Industrial, Inc.
Other Parties	AE Cote Nord Canada Bioenergy Inc. (bio-oil supplier) Vaulted Deep (Injection well owner/operator)
Legal ownership of the CDRs	Charm Industrial, Inc.
Verification report title	Report on Futurepast's Verification Engagement with Isometric Relative to the Charm Industrial Great Plains Bio-Oil Sequestration Project
Verification report version	1.0
Date of Issuance	2024-07-26
Prepared by	Futurepast: Inc.
VVB Contact	4250 Fairfax Drive, Suite 600, Arlington, VA 22203 / +1 703-358-9127 / count.carbon@futurepast.com | www.futurepast.com
Lead Verifier Name and Independent Reviewer	John Shideler served as lead verifier. Tina Sentner served as independent reviewer.

Addressee

This report is addressed to the management of Isometric HQ Limited, 27 New Dover Road, Canterbury, Kent, United Kingdom, CT1 3DN.

Executive Summary

Isometric engaged Futurepast to conduct a verification of the Charm Industrial Great Plains Bio-Oil Sequestration project as submitted to the Isometric registry. The project is a carbon capture and sequestration project that purchases bio-oil and sequesters it in salt caverns located in Kansas, USA. The bio-oil that is the subject of this verification was produced in Quebec, Canada, from woody biomass. The woody biomass consisted primarily of sawdust and wood shaving residues accumulated by a lumber mill that adjoins a pyrolysis oil production facility. Charm Industrial asserted the removal of 107.21 metric tonnes of carbon dioxide equivalent during its first reporting period (1 March – 30 April 2024).

Responsibilities

It was the responsibility of the project proponent, Charm Industrial, Inc. (aka Charm Industrial), to prepare its greenhouse gas (GHG) statements of carbon dioxide removals (CDRs) in accordance with the Isometric criteria. This responsibility included designing, implementing and maintaining a data management system adequate for the preparation and fair presentation of the statements. Charm Industrial was responsible for the fair presentation of its data and information and ensuring that these were free from material misstatements.

Based on the work we performed, it was the responsibility of Futurepast: Inc. (aka Futurepast) to express an opinion as to whether the carbon dioxide removals, as stated by Charm Industrial, were presented fairly in accordance with the agreed criteria.

Criteria

Isometric and Futurepast agreed that the criteria against which Carbon Dioxide Removal statements should be verified were the following:

- Isometric Standard v 1.2
- Isometric Bio-Oil Geological Storage v. 1.0.1
- Biomass Feedstock Accounting v. 1.2
- Biomass or Bio-oil Storage in Salt Caverns v. 1.0.2
- Embodied Emissions Accounting v. 1.0.2
- Transportation Emissions Accounting v. 1.0
- Energy Use Accounting v. 1.1.1

Futurepast assessed the criteria and found them suitable, considering:

a) the engagement's scope and boundaries;

b) the greenhouse gases and sources, sinks and reservoirs associated with Charm Industrial's facilities, physical infrastructure, activities, technologies, and processes;
c) the quantification methods employed; and
d) requirements for disclosures.

In accordance with the criteria, Charm Industrial reported greenhouse gas emissions using the Global Warming Potentials (GWP) found in the IPCC's Assessment Report 6 except when GWPs from prior IPCC assessment reports were embedded in life cycle assessment data. In Futurepast's opinion, the agreed criteria were relevant, complete, reliable and understandable.

Type of Engagement

This engagement included the following types of activities:

☒ Verification
☐ Validation
☐ Agreed-upon procedures

Objectives of the Verification

The objective of the verification was to determine whether Charm Industrial's stated Carbon Dioxide Removals from Reporting Period 1 of the Charm Industrial Great Plains Bio-Oil Sequestration project were fairly stated in conformity with the criteria.

Scope of the Verification

Facilities, physical infrastructure, activities, technologies, and processes	Activities included the generation of woody biomass residues produced from sustainably managed forests in Quebec; the production of bio-oil through pyrolysis at a production site in Port Cartier, QC; pre-processing the bio-oil in El Dorado, KS, to make it ready for injection in salt caverns; injecting bio-oil in salt caverns located near Hutchison, KS; and the transportation of the bio-oil from Quebec to Kansas and to the final injection site.
Greenhouse gas sources, sinks, and reservoirs	Sources of greenhouse gas emissions (CO_2, CH_4 and N_2O) were propane to start the exothermic reaction in the pyrolizer; transportation emissions; and electricity consumed at the pyrolysis facility, pre-processing facility, and salt cavern. Greenhouse gas sources were analyzed using consequential life cycle assessment techniques.
Types of greenhouse gases	Carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O)
Time period	1 March 2024 – 30 April 2024

Level of Assurance and Threshold of Materiality

This verification was performed at the reasonable level of assurance. The threshold of materiality for this verification was five (5) percent for quantitative information. Qualitative information materiality was assessed using the professional judgment of the verifier.

Verification Team Members and Reviewer

This verification was carried out by John Shideler, PhD, lead verifier for Futurepast. Mr. Shideler has worked as a greenhouse gas verifier since 2007 and as a validator since 2010. This verification was independently reviewed by Tina Sentner, a greenhouse gas lead validator and verifier.

Summary of Charm Industrial's Greenhouse Gas Statements

Charm Industrial reported 107.21 metric tons of carbon dioxide removals from the injection of bio-oil in salt caverns during its first reporting period. The reporting period began 1 March 2024, and ended on 30 April 2024. During the reporting period Charm Industrial injected bio-oil into salt caverns operated by Vaulted Deep in Hutchison, KS, on five occasions as shown in the following table:

DATE	REMOVAL ID NUMBER	CHARM ID	METRIC TONS SEQUESTERED
2024-03-12	rmv_1J09YQ0921S0WAQD	727	5.04
2024-03-30	rmv_1J0A20ZEK1S01GX8	728	32.83
2024-04-06	rmv_1J0CCFPRS1S0KRR1	729	8.69
2024-04-13	rmv_1J0CCT1P01S0C2XJ	730	29.30
2024-04-17	rmv_1J0CCW2BR1S0416W	731	31.35
Total removals during reporting period, in metric tons:			**107.21**

Table 1. List of total carbon dioxide removals.

Charm Industrial reported its carbon dioxide removals on the Digital MRV platform of Isometric, the Registry that issues CDRs for verified removals. No revisions to the reported removals were made as a result of Futurepast's verification.

Document Review and Site Visits

Futurepast performed a desk review of documents provided by Charm Industrial. Futurepast issued a validation report and opinion on 25 June 2024. As part of the validation engagement, Futurepast performed a desk review of documents and conducted site visits to the pyrolysis facility in Port Cartier, QC, Canada, to Charm Industrial's pre-processing plant in El Dorado, KS, USA, and to Vaulted Deep's salt cavern operations in Hutchison, KS, USA. The information gathered during those

site visits has served to inform the verification team about Charm Industrial's project activity that was the subject of this verification.

Standard, Protocol and Modules. Charm Industrial designed its project activities in accordance with requirements of the Isometric Standard (v. 1.2.0, 2024-02-15) and the following protocol and modules:

Applicable Protocols and Modules	Date	Version
Isometric Bio-Oil Geological Storage	2024-03-06	1.0.2
Biomass Feedstock Accounting	2024-05-24	1.2
Biomass or Bio-oil Storage in Salt Caverns	2024-03-06	1.0.2
Transportation Emissions Accounting	2023-12-22	1.0
Energy Use Accounting	2024-02-20	1.1.1
Embodied Emissions Accounting	2024-03-06	1.0.2

Table 2: Applicable protocols and modules.

Futurepast's verification team reviewed documents as part of its verification planning process. Key documents reviewed included those in the following table.

Documents Reviewed	Date	Version
V 1.5 Charm Industrial G.P. Bio Oil Sequestration PDD.docx	2024-05-30	1.5
Original AECN_Charm Purchase Agreement	2022-12-23	
2023_4 Purchase Agreement Amendment	2023-12-14	
Second_Amendment_to_Bio-Oil_Purchase_Agreement_Executed_by_AECN_March_1_2024	2024-03-01	
EU-ISCC-Cert-DE100-15517123	2023-09-23	
BNI SFI Certificate for Rebec Inc.	2021-03-12	
Forest Management Plan Tactical Integrated 2023-2028, North Shore Region, 0941, Ministry of Natural Resources and Forests	2023-04-01	
Vaulted Deep Sequestration as a Service Agreement	2023-09-19	
First Amendment to Vaulted Deep Sequestration as a Service Agreement	2024-03-24	
Kansas Underground Injection Control Permit, Class V Fluid Emplacement Permit	2022-05-22	
Bio-Oil Emplacement Authorization, Kansas Department of Health and Environment	2023-10-27	

Table 3. Key documents consulted.

During the validation engagement which preceded this verification, Futurepast's verification team performed site visits at the bio-oil production facility in Port Cartier, at Charm Industrial's pre-injection processing facility in El Dorado, KS, and at the Vaulted Deep injection facility in Hutchison, KS. Persons interviewed during the validation site visits and during a subsequent verification site visit are listed below:

NAME	TITLE	AFFILIATION	LOCATION	DATE
Mr. Tony Chabot	VP	AECN	Port Cartier, QC	2024-04-08
Ms. Manon Bouchard	Process Engineer	AECN	Port Cartier, QC	2024-04-08
Mr. Jean-Christophe Amado	Consultant	AECN	Port Cartier, QC	2024-04-08
Mr. Jeremy Fortin	Forest Operations	AECN	Port Cartier, QC	2024-04-09
Mr. Caleb Osborn	Field Operations Mgr.	Charm Industrial	El Dorado, KS	2024-04-10
Ms. Adriana Ovella	Chief Engineer	Vaulted Deep	Houston, TX	2024-04-10
Mr. Steve Pangburn	Operations Manager	Vaulted Deep	Hutchison, KS	2024-04-10
Ms. Vicky Spell	Office Manager	Vaulted Deep	Hutchison, KS	2024-04-10
Ms. Katie Holligan	Head of Operations	Charm Industrial	San Francisco, CA	2024-04-10
Mr. Max Lavine	Operations Measurement, Reporting, Verification	Charm Industrial	San Francisco, CA	2024-04-10 & 2024-07-11
Mr. Saumya Jain	Senior Software Engineer and Staff Scientist	Charm Industrial	San Francisco, CA	2024-07-11

Table 4: Personnel interviewed.

Description of Data and Information Management Systems

Charm Industrial developed a relational database it called "Ledger" to manage data for this project. Inputs from original sources such as weigh tickets and invoices were entered into Ledger via a user interface by Charm Industrial personnel. The database stored point-to-point distances from Google Maps for truck transport or from rail operators for delivery by rail. Similar operations captured information from other monitored activities. The software identified batches of bio-oil and tracked them as "lots" to allow for cases where a batch was split or combined. Lots, or batched combinations of lots, became removals once they were injected into a salt cavern. Futurepast confirmed that this approach permitted Charm Industrial to maintain records of mass balance and chain of custody throughout the process of monitoring bio-oil from its delivery to Charm Industrial to its ultimate injection into salt caverns.

Futurepast also confirmed that Charm Industrial's Ledger software incorporated quality controls to ensure the consistent use of calculation methods including conversion of units and standard emission factors. The software was designed to limit the need for manual data entries and to provide for audit and review of data inputs. An application programming interface transferred data from Ledger into Isometric's data platform. During the validation the validation reviewed the purpose and functioning of Ledger. During the verification the team interviewed the software's developer and concluded that Charm Industrial had developed an information system suitable for tracking parameters described in the BiCRS protocol, section 7.4. There were no changes to Ledger since the issuance of the validation report.

Ledger was built using Amazon web services database software. Data management was based on industry best practices for redundancy, reliable access and secure access control. Document

attachments accompanied data. Basic data entry controls ensured that only positive values could be entered (no negative numbers). Supervisory controls were aided by having source documents available to data users. Data were stored redundantly and backups were created every 10 seconds.

Discussion of Verification Team's Risk Assessment

The verification team's risk assessment addressed twenty-one types of risk considerations listed in ISO 14064-3, 6.1.2.3. These included inherent risks, control risks, and detection risks. The verification team identified risks for emissions and removals, occurrence, completeness, accuracy, cut-off, and classification. As a result of this assessment the verification team concluded that fourteen of the risk considerations presented a low risk, six a medium risk, and that one consideration did not apply to this project type. The verification team found no high risks and focused its attention on the six areas that presented a medium risk for errors, omissions, and misstatements. The six medium risk items are listed below:

REFERENCE	RISK ASSESSMENT CONSIDERATION
6.1.2.3 b	the relative effect of emission sources on the overall GHG statement and materiality
6.1.2.3 d	whether there are any significant emissions that are outside the normal course of business for the responsible party or that otherwise appear to be unusual
6.1.2.3 j	selection, quality and sources of GHG data
6.1.2.3 o	the characteristics of the data management information system and controls
6.1.2.3 p	the apparent effectiveness of the responsible party's control system in identifying and preventing errors or omissions
6.1.2.3 q	any controls used to monitor and report GHG data

Table 5. Risk assessment considerations.

The verification team applied evidence-gathering procedures to assess these risks and to determine whether evidence existed to reduce the risk of misstatement to an acceptably low level.

Description of Evidence-Gathering Procedures

Direct Removals and Project Emissions

Direct removals occurred when Charm Industrial injected carbon rich bio-oil into salt caverns where it would remain for a minimum of 1,000 years. Equation 2 of the Bio-oil Geological Storage v. 1.0.1, $CO_2e_{Removal,\,n} = CO_2e_{Stored,\,n} - CO_2e_{Counterfactual} - CO_2e_{LCA\ emissions,\,n}$ describes the estimated carbon removed. For this project the term "$CO_2e_{Counterfactual}$" can be ignored because Charm Industrial established in its validated project design document that no discount for storage of carbon dioxide in the woody biomass stored outdoors in Port Cartier, QC, needed to be considered.

Futurepast sampled injection events to reproduce from records the values of $CO_2e_{\ Stored}$. For removal "rmv_1J09YQ0921S0WAQD" (referred to by Charm Industrial as removal "727"), we

recalculated the gross mass of bio-oil injected into salt caverns at Vaulted Deep in Hutchison, KS, starting from weigh ticket values obtained at the Vaulted Deep facility. We subtracted the mass of liquid caustic soda and salt that were added to the bio-oil at Charm's pre-processing facility at El Dorado, KS. We multiplied the adjusted mass by the carbon content of the bio-oil and converted that number to carbon dioxide. The values we obtained matched very closely within 0.00045% of those displayed on the Isometric digital MRV (DMRV) platform.

Another meaningful term in Equation 2 was $CO_2e_{LCA\ emissions,\ n}$. This term describes "project emissions" that are to be subtracted to obtain net removals. The Bio-oil Geological Storage protocol required project proponents to subtract from the carbon dioxide removed all significant life cycle emissions associated with producing the bio-oil, transporting the bio-oil, and injecting the bio-oil into geologic storage. The method for arriving at $CO_2e_{LCA\ emissions,\ n}$ was to apply consequential life cycle assessment techniques to the sources of emissions associated with the project. Charm Industrial obtained from its major suppliers, AECN Bioenergy Canada and Vaulted Deep, LCAs that had been prepared for the respective facilities. Quantified project emissions were of four separate types:

- Emissions associated with the production of bio-oil at the AECN Bioenergy facility in Canada, and inventoried in the facility's LCA; these emissions were expressed in CO_2e/ton of bio-oil produced
- Transportation emissions, including embodied emissions for the transportation equipment used, expressed in CO_2e/ton per freight mile,
- Embodied emissions associated with equipment used at the Charm Industrial pre-processing site in El Dorado, KS, and the Vaulted Deep injection well site in Hutchison, KS, and
- Direct and energy indirect emissions associated with fuel and electricity consumed at the Charm Industrial pre-processing site in El Dorado, KS, and the Vaulted Deep injection well site in Hutchison, KS

During the validation of the project's PDD, the Futurepast concluded that the LCA for AEC Bioenergy was performed in accordance with the requirements of ISO 14040/14044 and the Isometric Standard's requirement for the use of consequential LCA.

The verification team reviewed the methodology for determining the ton-kilometer CO_2-e contribution of transportation. The LCA emissions factor for CO_2e per ton-kilometer was sourced from the Global Logistics Emissions Council (GLEC) Framework, version 3 (2023), Table 6 "North American Road Emission Intensity Values". It provided the source for the emission factor of 0.08 (80 g of CO_2e divided by 1000 to convert g to kg) used for "well to wheel" emissions of a tanker truck. The verification team recalculated this value for Charm Industrial's shipment of Lot 727 of bio-oil from Port Cartier, QC, to El Dorado, KS. The value we obtained was 5.245t tons. We compared this value to the displayed value of 5.244t in Isometric's DMRV platform. Our value nearly matched the calculation in the Isometric platform. (The variance, likely due to rounding errors, was 0.0285 of a percent). Embodied emission factors were based on data from the GREET

model. We compared our recalculation of the expected value of embodied emissions for the same trip from Port Cartier, QC, to El Dorado, KS. Our recalculated value was 155.8 kg which in the Isometric DMRV platform was displayed as 156 kg. From these recalculations we concluded that Charm Industrial was correctly applying LCA emission factors for transportation and tanker truck embodied emissions.

During the validation of this project, the Futurepast team verified a recent calibration of the truck scale used at Vaulted Deep to weigh trucks before and after unloading. The weigh ticket results from the Vaulted Deep scale were used to determine the mass of bio-oil sequestered after subtracting the mass of liquid caustic soda and salt that was added to the bio-oil at the Charm Industrial pre-processing site in El Dorado, KS.

Use of Information and Communication Technology

The verification team utilized a secure Microsoft Teams channel for the storage of documents submitted by Charm Industrial to document its project activities and to respond with documents to verification findings. The verification team also used Teams meetings to hold a video conference call for a virtual site visit with Charm Industrial personnel based in San Francisco, California, with the responsible party during the verification. Electronic communication among the parties was supplemented by email. In the opinion of the verification team, the use of ICT provided an equivalent level of assurance to that that would have been achieved using in-person techniques.

Forward Action Requests

Forward Action Requests created at the time of project validation are directed to future verifiers of the project proponent's statements submitted for verification. The following Forward Action Requests were noted in the validation report:

Item #	Forward Action Requests	Verification Action Taken
41	At verification, review the results of monitoring the tailgas produced at the AECN pyrolysis facility.	Per Charm, tail gas quantification was still modeled; AECN has an end-of-year deadline for source testing.
42	At verification, review whether emissions from the catalytic oxidizer in El Dorado remain below the threshold for requiring an operating permit.	Per Charm, the emissions remained below the threshold. No changes to operations at El Dorado were reported.
43	At verification, review the ability of the multigas detector at Vaulted Deep to detect potential emissions of CH_4 among other gases.	Per Charm, as of 2024-06-25 Vaulted had identified a new multigas analyzer to install and was scheduling installation.
44	At verification, confirm that the project maintains records of laboratory analyses	The verifier confirmed that records of laboratory carbon content analysis were

	and evidence to demonstrate regulatory compliance related to injectate emplacement.	maintained. Per Charm, KDHE permit required certain testing of non-GHG related parameters when emplacing injectate. Vaulted provided a form to Charm listing permit requirements and the status of their compliance. Verifier has reviewed the form dated 2024-06-26 and signed by Adriana Ovalle.
46	At verification, determine whether there are additional sites or facilities from which bio-oil is sourced that are material to the GHG statement and perform site visits as required.	Per Charm, no additional sites were used to procure bio-oil.
47	At verification, confirm that the feedstock used to produce bio-oil at the AECN facility continues to be mill residues and that the supply of mill residues is not supplemented by merchantable chipped round wood.	Per Charm, AECN was still using mill residues from Arbec.
52	At verification, confirm whether injection batches of bio-oil are the same as production batches or are blends of production batches.	Per Charm, injection batches were comprised of a blend of AECN production batches. Each truckload of bio-oil sent to Vaulted was separately weighed and analyzed for carbon content prior to the addition of salt and caustic soda.
53	At initial verification, confirm that a sample of data entered into Charm Industrial's Ledger database produces an identical output when uploaded in Isometric's data platform.	Per Charm, the removal numbers (t of CDR) are from the DMRV (digital MRV of Isometric) were the authoritative numbers. The output of Ledger may differ slightly due to different rounding protocols. The uncertainty discount using variance propagation was calculated only on the Isometric DMRV system.
54	At verification, validate any updated forecasts for CDR generation in out-years.	Charm had not updated its forecasts.

Table 6. Forward action requests.

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Approved Deviations

The following deviations from the Isometric Standard or applicable Protocols or Modules were approved for this project at the time of its validation.

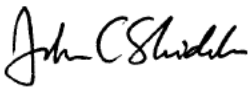
Item #	Document Reference	Deviation	Authority/Date
1	Biomass or Bio-oil Storage in Salt Caverns, 3.1.1	Instead of Futurepast, the salt cavern operator will notify Charm Industrial in the case where required alarms and automatic surface shut-off systems are activated.	Isometric, email dated 2024-04-15
2	Isometric Standard, 3.1	Isometric considered Section 3.1 to be sufficiently evidenced through the existing language in the affidavit provided by AECN and approved a deviation from the requirement for AECN to stipulate contractually that it would not advertise that it was producing a "low emission product."	Isometric, email dated 2024-04-15

Table 7. Approved Deviations

Verification Criteria

Futurepast conducted its verification activities based on the requirements of ISO 14064-3:2019, Specification with guidance for the verification and validation of greenhouse gas statements.

Verification Team Leader and Independent Reviewer Signatures

Verification Team Leader	 John C. Shideler, 17 July 2024
Independent Reviewer	 Tina Sentner, 22 July 2024
This report is approved when signed and dated by the independent reviewer.	

Annex A: Verification Plan

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Verification Workbook: Verification Plan

CLIENT	Isometric	CONTACT:	Chris Podgorney
RESP. PARTY	Charm Industrial	Email:	[redacted]@isometric.com
ENGAGEMENT	Verification of Charm Industrial KS sequestration prc	Phone:	+44 (20) [redacted]
CRITERIA	[Enter criteria used to prepare GHG statements here]		
CRITERIA	[Enter criteria used to prepare GHG statements here]		
CRITERIA	[Enter criteria used to prepare GHG statements here]		

PLAN APPROVED BY:	JS	PLAN DATE:	9-Jul-2024	PLAN REV.:	0
LEVEL OF ASSURANCE:	Reasonable	ENGAGEMENT TYPE:	Verification		

OBJECTIVES Verify CDRs per Bio-oil Geologic Storage protocol Mar-Apr 2024
[Enter objective 2 here]
[Enter objective 3 here]

SCOPE *Entries are required for all scope elements a-f.*

a) **GHG sources, sinks and reservoirs**
Sources of greenhouse gas emissions (CO2, CH4 and N2O) were propane to start the exothermic reaction in the pyrolizer; transportation emissions; and electricity consumed at the pyrolysis facility, pre-processing facility, and salt cavern.

b) **Boundaries**
Baseline and project: GHG emissions associated with the harvesting of biomass, its conversion to bio-oil, its transportation and pre-treatment, its injection into a class V permitted injection well and permanent underground storage.

c) **Physical infrastructure, activities, technologies and processes within the scope**
Activities included the generation of woody biomass residues produced from sustainably managed forests in Quebec; the production of bio-oil through pyrolysis at a production site in Port Cartier, QC; pre-processing the bio-oil in El Dorado, KS, to make it ready for injection in salt caverns; injecting bio-oil in salt caverns located near Hutchison, KS; and the transportation of the bio-oil from Quebec to Kansas and to the final injection site.

d) **Data management details**
Charm Industrial developed a database it called "Ledger" to store data from project activities. Data stored in Ledger were transferred to an Isometric database via an Application Programming Interface (API) software. Once resident on the Isometric platform data could be exported to an Excel spreadsheet for verification purposes.

e) **Management controls**
The Charm Industrial project team's operations were performed in accordance with an implemented EHS management system and following the requirements of the Isometric standard, protocol and modules.

f) **Time periods**
Reporting period 1: March 1, 2024 - April 30, 2024

FPF-AU-117
Revised: 2024-04-20

1 of 2

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IDENTITY AND ROLES OF VERIFICATION TEAM MEMBERS

NAME: John Shideler **ROLE:** Team Leader 571-278-9486

VERIFICATION CRITERIA: ISO 14064-3 2019

QUANT. MATERIALITY THRESHOLD (%): 5
PERFORMANCE MATERIALITY (%): 3
DATE PLAN SENT TO RESPONSIBLE PARTY: 9-Jul-2024

REASON(S) FOR PLAN REVISION: [Explain reasons here]

SCHEDULE OF VERIFICATION ACTIVITIES

(Include *all* activities; update as required during the verification.)
Use the "Time" column for scheduled site visit activity times.

DAY	DATE	TIME (PDT)	ACTIVITY	TEAM MEMBER
Choose	6/24/2024		Download RP1 data from Isometric	J. Shideler
Choose	7/1/2024		Document review and planning	J. Shideler
Choose	7/4/2024		Issue 1st list of findings	J. Shideler
Choose	7/8/2024		Verification planning	J. Shideler
Choose	7/9/2024		Send Workbook to IR for interim review	J. Shideler
	Teams conference with Charm Industrial (Pacific Daylight Time)			
Thursday	11-Jul-2024	13:00	Opening meeting	J. Shideler
Thursday	11-Jul-2024	13:15	Data management system and controls	J. Shideler
Thursday	11-Jul-2024	13:30	Quantification of baseline and project emissions	J. Shideler
Thursday	11-Jul-2024	14:00	Ledger and API to transfer data to Isometric	J. Shideler
Thursday	11-Jul-2024	14:30	Variance propagation	J. Shideler
Thursday	11-Jul-2024	14:45	Risks associated with storage of bio-oil at Vaulted	J. Shideler
Thursday	11-Jul-2024	15:00	Discuss FARs	J. Shideler
Thursday	11-Jul-2024	15:30	Closing meeting	J. Shideler
Choose	12-Jul-2024		Verifier works on documentation of audit	J. Shideler
Choose	17-Jul-2024		Verifier submits documentation to IR for review	J. Shideler
Choose	26-Jul-2024		Futurepast issues final report and opinion	J. Shideler

NOTE: Times in the schedule of activities are subject to change based on circumstances encountered.
NOTE: Verifiers may use the following techniques and activities, as appropriate:

a) observation;
b) inquiry;
c) analytical testing;
d) confirmation;
e) recalculation;
f) examination;
g) retracing;
f) tracing;
i) control testing;
j) sampling;
k) estimate testing;
l) cross-checking;
m) reconciliation

Annex B: List of Findings

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Verification Workbook: List of Findings

Client Name: Isometric
Lead Verifier: John Shideler

Client ID: IMT23
Engagement #: 11

Instructions to Verifiers

In executing the validation/verification, validators/verifiers shall undertake the following activities:
a) collection of sufficient objective evidence on original data/information, ensuring its traceability through the data/information management process, any further analysis and calculation;
b) identification of misstatements and consideration of their materiality;
c) assessment of conformity with specified requirements, taking into account the validation/ verification program.
Record findings of **Nonconformity (NC)** and **Clarification Requests (CR)** on this form. Findings of **Immaterial Nonconformity (INC)** may be listed (or, where a GHG program requires their reporting, shall be listed). **Forward Action Requests (FAR)** and **Recommendations (R)** may also be included as items on this form.
Finding/Clarification: State the requirement that was not met, or ask for clarification of information related to audit objectives.
Reference (Ref.): Cite a relevant requirement in a protocol, standard or procedure; or cite information provided by the Responsible Party in a monitoring plan, report or other document.
Audit Evidence: Cite evidence that supports the finding of nonconformity, or (optionally) a reason for requesting clarification.
Responsible Party Action: Summarize the response provided by the Responsible Party with respect to the Finding or Clarification Request.
Lead Verifier Conclusion: State if the response has been accepted, and the disposition of the finding (closed, rewritten as a new NC, etc.).
NOTE: If a matter comes to the verifier's/validator's attention that causes the verifier/validator to believe in the existence of intentional misstatement or noncompliance by the responsible party with laws and regulations, the verifier/validator shall communicate the matter to the appropriate parties as soon as practicable. Intentional misstatements include the possibility of fraud.

#	Type	Issue/Clarification	Ref.	Audit Evidence	Responsible Party Action	Lead Verifier Conclusion
1	CR	Please explain why emissions per removal event vary from 30.9% to 82.9% of the gross removals.	Tab 'Removals' in spreadsheet 'ggsv_1J0XYDJ9R1S0WVRQ 1'		All of the removal events include the lot-specific emissions associated with the event. These emissions correspond to a specific removal and include the emissions from biomass pyrolysis, transport of bio-oil to the pre-processing site, quantity of LCS added, and the transport of injectate from the pre-processing site to the injection site.	Clarification accepted. The finding is closed.

Revised: 2023-02-13

1 of 11

#	Type	Issue/Clarification	Ref.	Audit Evidence	Responsible Party Action	Lead Verifier Conclusion
					As discussed in the PDD, site emissions, or production emissions which do not map clearly to a single removal, are computed in aggregate. These include emissions from the use of energy from diesel generators and grid power, and transport emissions from the delivery of consumables to the site. These emissions, along with the embodied emissions from equipment which are computed based on amortization over time, are aggregated and deducted from removals during the reporting period in order to accurately calculate net CDR for the period. These can be deducted from any removal(s) that occurred during the reporting period. The removals ending in KRR1 and WAQD have elevated levels of emissions relative to the other reported removals because those had the site and amortized embodied emissions deducted from the total removal from April and March respectively. Conversely, the other removals that occurred during the period are calculated without those emissions. The end result is that lot, site, and amortized embodied emissions are netted out of the gross CO2e removed for the reporting period.	
2	CR	Project emissions vary slightly in the GHG Statement document and the download from the Isometric data platform. Please clarify how the difference occurred.	GHG Statement, section E and Isometric database download.	GHG Statement, section E (106.802 t) vs. 106 200.8 in the Isometric database.	This discrepancy appears to be due to a semantic difference between how the GHG Statement Report results and the Isometric data platform were formatted. In the GHG Statement Report results, the Uncertainty Discount was included in the Total Emissions for Reporting Period — In	Clarification accepted. The finding is closed.

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#	Type	Issue/Clarification	Ref.	Audit Evidence	Responsible Party Action	Lead Verifier Conclusion
					the Isometric platform, the values are shown separately. In order to avoid further confusion, I have revised the GHG Statement Report results, removing the Uncertainty Discount from the Total Emissions for Reporting Period and instead subtracting it from the Net Removals for Reporting Period. This does not change the total removals, but does revise the Total Emissions in the GHG Statement Report to match the value in the Isometric data platform.	
3	CR	Please clarify the role of the following datapoint terms: • Security Oil • Transwood, OK • Minifinery • Univar Solutions • AJ's • MCM Pump 1 • MCM Pump 2			1.Security Oil 1.This is the site's supplier for diesel fuel. The datapoint refers to the distance between Security Oil's location and the Minifinery pre-processing site. 2.Transwood, OK 1.This is the depot for Transwood, the short-haul trucking provider used to transport injectate from the Minifinery pre-processing site to the injection site. The data point refers to the distance for the routing from the Depot to the Minifinery pre-processing site, to the Vaulted injection site. 3.Univar Solutions 1.This is the site's supplier for Liquid Caustic Soda. The datapoint refers to the distance between Univar's location and the Minifinery pre-processing site. 4.AJ's 1.The Minifinery pre-processing site is located at the property owned by AJ's Services. It is used interchangeably with Minifinery to refer to the pre-processing site.	Clarification accepted. The finding is closed.

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#	Type	Issue/Clarification	Ref.	Audit Evidence	Responsible Party Action	Lead Verifier Conclusion
					5.MCM Pump 1 + 2 1.These refer to the O'Drill MCM 250 Series centrifugal pump. These pumps are used to move the bio oil through the tank system.	
4	CR	Please clarify how to filter data to obtain a list of all removal components that together sum to the value of rvc_1J09YQ0921S0TPFG.	Data down-load from Isometric, tab 'Removal Component'.		Explanation provided by Isometric in email from 2024-07-03 providing step-by-step instructions for summing the components that add up to the value of any removal.	Clarification accepted. The finding is closed.
5	CR	For the emissions from fuel consumed in the transportation of bio-oil, please clarify whether truck or rail transportation was used during the reporting period and direct me to data that will confirm the number of trips.			Truck transportation was used for all bio-oil processed. The number of trips is evidenced by the BOL/Invoicing docs for each truck-load of bio-oil delivered. For example, looking at the 4/17 removal ending in 96X2. Two lots of oil were injected, which correspond to Lots 779 and 780. 779 was disposed in its entirety in this injection. The transport process emissions are shown in Emission 2846. Measurement 1203 shows the verified mass of the Lot, which is evidenced by the BOL/invoicing document attached. That document also shows that it was shipped to the Minifinery site at AJ's services. This distance is accounted for by Measurement 1123 Embodied emissions for the same load are captured in Emission 2847 on Lot 779.	Clarification accepted. The finding is closed.

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#	Type	Issue/Clarification	Ref.	Audit Evidence	Responsible Party Action	Lead Verifier Conclusion
					780 was partially disposed during this injection. The transport process emissions for the injected tonnage are shown in Emission 2848. Measurement 1204 shows the verified mass of the Lot, which is evidenced by the BOL/invoicing document attached. The destination is accounted for in the same way as Lot 779 described above. You can also see that not all of the Lot was used in this Removal, as the mass injected is less than the total lot mass. When the remainder of the Lot is injected, the transport emissions for that remainder will be netted out from that removal's CDR. Embodied emissions for the same load are captured in Emission 2849 on Lot 780.	
6	CR	Please clarify what evidence is available to establish whether the emptied trucks or railcars that delivered bio-oil to Kansas had backloads or not.			Evidence regarding whether or not bio-oil delivery vehicles had backloads is not available. These vehicles are managed by a third-party transport provider, so their use after the delivery of their payload is not consistently visible to Charm. However, we account for this in two different ways:	Clarification accepted. The finding is closed.

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#	Type	Issue/Clarification	Ref.	Audit Evidence	Responsible Party Action	Lead Verifier Conclusion
					For Process Emissions, we use GLEC emissions factors, which use large transport datasets to incorporate empty operations into their calculations. "To ensure the consideration of empty operations and the accounting of the related emissions, the use of vehicles in transport chains is based on a round trip approach, both for calculation of emission intensities and for the allocation of emissions to consignments in shared transport. Therefore, the necessary return of a vehicle is included, even though freight is usually moved from consignor to consignee in one direction only. This ensures that all emissions related to a transport operation are included." (GLEC Framework v3, 15). For Embodied Emissions, the CI is increased by the average "deadhead mileage" for tanker and non-tanker trucks as reported by the USDA at 41% and 15.4% of loaded mileage respectively in An Analysis of the Operational Costs of Trucking: 2023 Update.	
7	CR	Please clarify the GHG source (singular) or the (plural) GHG sources from pre-processing that trigger uncertainty analysis based on the 20% increase in value that results in a 1% or greater change in CDRs.			The pre-processing parameters identified by Sensitivity Analysis as requiring adjustment to account for uncertainty are diesel fuel used to power the pre-processing facility and liquid caustic soda used to buffer the pH of the bio-oil.	Clarification accepted. The finding is closed.

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#	Type	Issue/Clarification	Ref.	Audit Evidence	Responsible Party Action	Lead Verifier Conclusion
8	CR	Please clarify the steps taken to derive project emissions from the use of consummables (especially caustic soda) at the pre-porcessing site.			Consumables Delivery Transport Emissions Delivery Transport Emissions are recognized as Site Emissions. They are computed using the Distance Based Method and GLEC ton-mile emission factors based on the mass of material delivered making a round-trip truck journey from the origination point to the site and back. This applies to diesel, salt, and liquid caustic soda. Example: Removal Ending in KRR1 Site Emissions 34 and 35 show emissions from a single delivery of LCS. SE 34 shows the process emissions associated with transporting 1.542 MT of LCS from the supplier to the site. The document shows the mass conversion for this 4/4 delivery. The associated invoice was uploaded to Teams separately in the April MRV Packet. SE 35 shows the embodied emissions from the same delivery. Liquid Caustic Soda The emissions from the liquid caustic soda itself are computed using the GREET 2023 emission factor for LCS 50% solution. LCS emissions are computed as Lot Emissions since a measured quantity of LCS is added to each Lot of injectate. Example: Removal ending in KRR1: Emission 2826 shows 1.925 MT CO2e in emissions associated with the use of 1.25 m3 of LCS in the removal. This is documented by operator notes.	Clarification accepted. The finding is closed.

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#	Type	Issue/Clarification	Ref.	Audit Evidence	Responsible Party Action	Lead Verifier Conclusion
					Diesel: The emissions from the use of diesel in on-site generators is computed using the GLEC v3.0 emission factor for diesel combustion. Diesel that is delivered to the site during a reporting period is assumed to be used during that reporting period. The emissions from the use of diesel in on-site generators is computed using the GLEC v3.0 emission factor for diesel combustion. Diesel that is delivered to the site during a reporting period is assumed to be used during that reporting period. Example: Removal ending in KRR1. Site Emissions 25-27 show emissions from a single delivery of diesel fuel. 1.311 MT of diesel was delivered on 4/9. SE 25 shows 5.1 MT CO2e from combustion. SE 26 shows 1kg CO2e from process transport. As you can see from Measurement 1130, the supplier is very close by, only 4.67km from the site. SE 27 shows 0kg Embodied Emissions as the short distance made this emission negligible. Salt: The salt is a waste product from the normal operation of a Morton salt factory in Hutchison, KS. Because it is a waste product that would have been produced absent the project and is received free of charge, only the transportation emissions associated with its delivery are included in the project emissions calculations.	

#	Type	Issue/Clarification	Ref.	Audit Evidence	Responsible Party Action	Lead Verifier Conclusion
9	CR	Please clarify where the following records can be found: • the mass of the salt and the LCS added to the batches injected on March 12 • records of calibration for the scale that was used to weigh the mass of the salt and the LCS added to the batches that were injected on March 12.	PDD, Monitoring Plan, p 22.	The verifier is attempting to reproduce for removals that occurred on March 12 the following: • the mass of the batches injected at Vaulted (per Vaulted records, 9.41 and 11.95 tons • the mass of the consumables that were subtracted from the injected mass • the adjusted mass (gross injected weight minus weight of consumables)	Operating logs from the pre-processing site are available on the Isometric dMRV platform.	Clarification accepted. The finding is closed.

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#	Type	Issue/Clarification	Ref.	Audit Evidence	Responsible Party Action	Lead Verifier Conclusion
10	CR	Please confirm that the scales used to weigh trucks unloading at Vaulted and those used to weigh the consummables provide readings in US pounds and explain where these values are converted to metric units.	PDD, Monitoring Plan, p 22.		1. The weight of trucks unloading at Vaulted are measured in US pounds. The conversion to kilograms is done in an external spreadsheet. An example has been uploaded to Teams, titled "3/30 Unit Conversions Example". 2. The weight of salt added to the injectate is measured in US pounds. The conversion to kilograms is done in an external spreadsheet. An example has been uploaded to Teams in the same document referenced above. 3. The quantity of LCS added to the injectate is measured in gallons. The product density in g/cm3, the equivalent of kg/l, is established by an SDS sheet for 50% liquid caustic soda at 1.5 kg/l. Gallons are converted to liters using a standard conversion of 3.785 liters per gallon, and liters are converted to kilograms using the density information from the SDS. A copy of both the SDS sheet titled "LCS SDS" and an example of the spreadsheet (also the same document as referenced above) have been uploaded to Teams.	Clarification accepted. The finding is closed.
11	CR	Please provide the most significant assumptions used to determine the per mile emissions from "Fuel use from Injectate Transport to Pre-Processing. Specifically: • Vehicle type • Assumed fuel economy of the vehicle (e.g liters of diesel consumed per 100 km traveled) • Additional CO2e from embodied emissions • Source of emission factors (i.e. GLEC reference)	PDD, Monitoring Plan, p 11.	Transparency here is requested as this project emission source has been identified as one of the significant sources of project emissions.	1.Significant assumptions to determine "Fuel use form injectate transport to pre-processing" are as discussed in the GHG Statement Report appendix in the PDD a.Vehicle Type i.Tanker truck b.Assumed fuel economy of the vehicle i.N/A – The emission factor used is based on ton-miles traveled by a particular vehicle type. Therefore the mass, distance traveled and vehicle type are taken into account when calculating the ton-mile emissions; assumptions regarding vehicle fuel economy are not necessary. c.Additional CO2e from embodied emissions	Clarification accepted. The finding is closed.

#	Type	Issue/Clarification	Ref.	Audit Evidence	Responsible Party Action	Lead Verifier Conclusion
					i.Please see below from the GHG Statement Report: 1.For all truck transport, the Vehicle Embodied Emissions are calculated using the GREET 2023 emissions factors for Medium-and-Heavy-Duty (MHDV) Trucks and Trailers. The total value for the embodied emissions is divided by the expected useful life for a Heavy Duty compression ignition (diesel) engine established by US EPA Office of Transportation and Air Quality in 2016 for engines manufactured after 2004 at 435,000 miles. This yields a quantity of embodied carbon per mile traveled. d.Source of emission factors i.Trucking process emissions 1.GLEC Framework v3, p90 Table 6 ii.Trucking embodied emissions 1.GREET 2023 MHDV Truck and Trailer ADR – Database Screenshots uploaded to Teams titled GREET 2023 Trailer ADR 1 and 2, GREET 2023 Truck ADR 1 and 2. 2.US EPA "Heavy-Duty Highway Compression-Ignition Engines and Urban Buses: Exhaust Emission Standards" 3.Calculations using the above sources, pulled from the GHG Statement supplemental document, have been uploaded to Teams in a document titled MHDV Embodied Emissions Calcs	Verifier confirmed emission factor of 0.2 kg/t-km for tanker trucks in GLEC v3, Table 6.

Annex C: Verification Opinion

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Independent Opinion on the Statements of

Isometric

Relative to the

Charm Industrial Great Plains Bio-Oil Sequestration Project

Opinion Date: 2024-07-26

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To the Management of:	Isometric HQ Limited
Independent Verification Opinion of:	Futurepast: Inc. 4250 Fairfax Drive, Suite 600 Arlington, Virginia 22203 USA
Subject Matter:	Sequestration of bio-oil in salt caverns in Kansas, USA, by Charm Industrial, Inc.
For the Period:	1 March 2024 through 30 April 2024

Details Pertaining to the Statements

Responsible Party, if Different from Addressee	Charm Industrial, Inc.
Statement of Responsibility:	It was the responsibility of Charm Industrial, Inc. to prepare its Carbon Dioxide Removal statements in accordance with the Isometric Standard, the Bio Oil Geological Storage protocol, and related Modules. This responsibility included designing, implementing and maintaining a data management system relevant to the preparation and fair presentation of the statements. Charm Industrial, Inc. was responsible for the fair presentation of its data and information and ensuring that these were free from material misstatements.

Intended User and Limitation of Liability

Intended User:	This report has been prepared for the management of Isometric for the purpose of issuing Carbon Dioxide Removal credits and displaying these on its registry of projects. Intended users also include buyers of the Carbon Dioxide Removal credits.
Limitation of Liability:	Charm Industrial, Inc. was solely responsible for the preparation and presentation of the information it has submitted to Isometric. Futurepast: Inc.'s role was limited to expressing an opinion as to whether the Carbon Dioxide Removals as uploaded by Charm Industrial, Inc. to Isometric's Digital MRV platform were presented fairly in accordance with the Isometric criteria. In doing so, we do not assume any duty,

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liability, or responsibility of Charm Industrial, Inc., Isometric or of any third party. Our duties in relation to the opinions expressed here are owed solely to Isometric. As such, we do not accept any responsibility for any loss allegedly occasioned by any third party acting or refraining from action because of our expressed opinions.

Details Pertaining to the Validation/Verification Body

Futurepast's Role:	Futurepast: Inc. is an impartial third-party validation/verification body.

Declaration of Impartiality

Evaluation of Actual or Potential Conflicts-of-Interest	Futurepast: Inc., and the verification team members and independent reviewer, have evaluated their potential for compromised impartiality and found no actual or potential threats to impartiality with respect to the performance of this engagement.

Details Pertaining to the Verification Team and Independent Reviewer

Verification Team Leader:	This verification was led by John Shideler.
Independent Reviewer:	This verification was independently reviewed by Tina Sentner.

Details Pertaining to the Verification

Type(s) of Engagement:	Verification of historical information
Objectives of the Verification:	The objective of the verification was to determine whether Charm Industrial's stated Carbon Dioxide Removals from Reporting Period 1 of the Charm Industrial Great Plains Bio-Oil Sequestration were fairly stated in conformity with the criteria.
Scope of the Verification:	**Facilities, physical infrastructure, activities, technologies, and processes** — Activities included the generation of woody biomass residues produced from sustainably managed forests in Quebec; the production of bio-oil through pyrolysis at a production site in Port Cartier, QC; pre-processing the bio-oil in El Dorado, KS, to make it ready for

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	injection in salt caverns; injecting bio-oil in salt caverns located near Hutchison, KS; and the transportation of the bio-oil from Quebec to Kansas and to the final injection site.
Greenhouse gas sources, sinks, and reservoirs	Sources of greenhouse gas emissions (CO_2, CH_4 and N_2O) were propane to start the exothermic reaction in the pyrolizer; transportation emissions; and electricity consumed at the pyrolysis facility, pre-processing facility, and salt cavern. Greenhouse gas sources were analyzed using consequential life cycle assessment techniques.
Types of greenhouse gases	Carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O)
Time period	1 March 2024 – 30 April 2024

Level of Assurance: Reasonable

Threshold of Materiality: For quantitative information, 5%
For qualitative information, according to the professional judgment of the lead verifier

Verification Criteria: Futurepast performed this in accordance with the requirements of ISO 14064-3:2019.

Description of Work Performed

Description of the Basis for Our Conclusions and Opinion

Futurepast performed a desk review of documents provided by Charm Industrial and during the validation performed site visits to the pyrolysis facility in Port Cartier, QC, Canada, to Charm Industrial's pre-processing plant in El Dorado, KS, USA, and to Vaulted Deep's salt cavern operations in Hutchison, KS, USA. The information gathered during those site visits resulted in the issuance of a favorable validation opinion (25 June 2024) and served to inform the verification team about Charm Industrial's project activity that was the subject of this verification. In this engagement, the verification team performed additional work to verify the accuracy of the statements of bio-oil sequestration that Charm Industrial made related to its first reporting period (1 March – 30 April 2024) of the Charm Industrial Great Plains Bio-Oil Sequestration project.

The information we verified was historical in nature.

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Summary of the Responsible Party's Statements

DATE	REMOVAL ID NUMBER	CHARM ID	METRIC TONS OF CO_2E SEQUESTERED
2024-03-12	rmv_1J09YQ0921S0WAQD	727	5.04
2024-03-30	rmv_1J0A20ZEK1S01GX8	728	32.83
2024-04-06	rmv_1J0CCFPRS1S0KRR1	729	8.69
2024-04-13	rmv_1J0CCT1P01S0C2XJ	730	29.30
2024-04-17	rmv_1J0CCW2BR1S0416W	731	31.35
Total removals during reporting period, in metric tons:			**107.21**

Limitations, If Any

None identified.

Modifications, If Any

None identified.

Conclusions

Based on our evaluation of the evidence, in our opinion the carbon dioxide removals displayed by Isometric on its registry (https://registry.isometric.com/) present fairly, in all material respects, the carbon dioxide removals by the Charm Industrial Great Plains Bio-Oil Sequestration Project's first reporting period from 1 March 2024 to 30 April 2024 and are stated in conformity with the Isometric Standard, the Bio Oil Geological Storage protocol and associated modules.

Approvals

Verification Team Leader: John C. Shideler

Date: 2024-07-17

Independent Reviewer:

Tina Sentner
Date: 2024-07-22

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Signature

Verification/Validation Body: Futurepast: Inc., Arlington, Virginia USA

Opinion Issued: 2024-07-26

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