

VERIFICATION REPORT

RED HILLS 123 MW WIND POWER PROJECT



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Summary:

Western Farmers Electric Cooperative (Client and/or WFEC) commissioned Conestoga-Rovers & Associates Limited (CRA) to perform the fourth verification of the Red Hills 123 MW Wind Power Project, VCS Project ID: 288 (Project Activity) located near Elk City, Oklahoma, U.S.A. on behalf of Red Hills Wind Project, LLC (Project Proponent). The fourth consecutive verification period extends from 01 January 2012 through 31 December 2012.

The Project Activity consists of the installation and operation of 82 Acciona Windpower AW-77/1500, 1.5 MW turbines for a total rated nameplate capacity of 123 MW. The turbines are located over an area of approximately 5,000 acres of rural and agricultural/grazing lands. Electricity generated by the turbines is upgraded from a 34.5 kilovolt (kV) collection line rating to a 138 kV rating at the Project Activity's substation and then transferred via transmission line to the point of interconnection at the Western Farmers Electric Cooperative transmission line where the electricity is then delivered to the Southwest Power Pool (SPP) grid. The Project Activity's intent is to generate electricity from renewable sources and therefore displace electricity that otherwise would have been produced for or distributed to the SPP grid in the absence of the Project Activity.

The Project Proponent utilizes the United Nations Framework Convention on Climate Change (UNFCCC) Clean Development Mechanism (CDM) methodology entitled: "Consolidated baseline methodology for grid connected electricity generation from renewable sources (ACM0002), Version 09.0", dated 13 February 2009 as per the registered VCS Project Description (VCS PD), dated November 2008.

The scope of this verification is such that CRA, as an independent third party recognized as a Validation and Verification Body by the VCS (Registration Number 027) is responsible for reviewing the VCS Monitoring Report including accompanying materials, previous VCS Verification and Validation Reports, and the VCS PD including the monitoring plan, baseline assessment, and any supporting documentation. CRA utilized a risk based analysis against the relevant requirements of both the interpretation from the CDM and of VCS Program Guide Version 3.4 and VCS Standard Version 3.3 as applicable.

As part of the verification process, CRA reviewed the completeness, conservativeness, and accuracy of the underlying evidence for the assumptions and claims made, and data sources used. The results of this investigation were then, together with the results of the review of other areas, combined to form the necessary input for the verification report and opinion.

The verification report and associated annexes document a total of nine findings which include:

- Six Corrective Action Request (CAR)
- Three Clarification Requests (CLs)
- Zero Forward Action Request (FARs)

Upon review of the documentation and explanations provided by the Project Proponent, all findings were closed in a clear and transparent manner.

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1. INTRODUCTION

1.1 Objective

Western Farmers Electric Cooperative (Client and/or WFEC) commissioned Conestoga-Rovers & Associates Limited (CRA), on behalf of Red Hills Wind Project, LLC (Project Proponent), to complete the fourth independent third party verification for the registered Verified Carbon Standard (VCS) project entitled:

- Red Hills 123 MW Wind Power Project located near Elk City, Oklahoma, U.S.A., VCS Project ID: 288. (Project Activity)

CRA completed the verification pursuant to the relevant requirements of the VCS guidance (VCS Program Guide, Version 3.4, and VCS Standard, Version 3.3) as well as translational guidance from the United Nations Framework Convention on Climate Change (UNFCCC) Clean Development Mechanism (CDM). As detailed in Section 5.1.1 of the VCS Standard Version 3.3, *"Verification is the periodic ex-post independent assessment by a validation/verification body of the GHG emission reductions and removals that have occurred as a result of the project during the monitoring period, conducted in accordance with the VCS rules."* The objective of CRA, on behalf of the VCS, is to ensure that only Project Activities that meet the established criteria receive a positive and unconditional verification statement. Specifically, the criteria states that the registered Project Activity must result in emission reductions that are:

- Relevant
- Complete
- Consistent
- Accurate
- Transparent
- Conservative

In the verification of this VCS Project Activity, CRA used a risk-based verification approach to focus and determine the detailed scope of the verification. The VCS and the CDM are rules-based mechanisms; CRA has ensured that the rules for requesting registration as a proposed VCS Project Activity are complied with, in accordance with the VCS Program Guide Version 3.4, and the VCS Standard Version 3.3.

The key risks associated with the project design, baseline, monitoring plan, emission reduction estimates, environmental impacts, and stakeholder comments are elements that are critical for meeting VCS criteria for achieving real, measurable, permanent, additional, independently audited, unique, transparent, and conservative greenhouse gas (GHG) reductions.

1.2 Scope and Criteria

The Client commissioned CRA to perform an independent third party verification for the fourth consecutive monitoring period (01 January 2012 through 31 December 2012) of the registered Project Activity, which is located near Elk City, Oklahoma, U.S.A.

Utilizing a risk-based approach as part of the verification process, CRA reviewed the completeness, conservativeness, and accuracy of the underlying evidence for the assumptions and claims made, and data sources used. The results of this investigation then, together with the results of the review of other areas, gave the necessary input for the verification opinion which is completed pursuant to guidance provided within the VCS Program Guide Version 3.4, and the VCS Standard Version 3.3.

1.3 Level of Assurance

CRA has conducted the verification activities and has prepared this report to a reasonable level of assurance with a maximum allowable materiality threshold of 5 percent as outlined in Section 5.3.1 of the VCS Standard, Version 3.3.

1.4 Summary Description of the Project

The Project Activity consists of the installation and operation of 82 Acciona Windpower AW-77/1500, 1.5 MW turbines for a total rated nameplate capacity of 123 MW. The turbines are located over an area of approximately 5,000 acres of rural and agricultural/grazing lands. Electricity generated by the turbines is upgraded from a 34.5 kilovolt (kV) collection line rating to a 138 kV rating at the Project Activity's substation and then transferred via transmission line to the point of interconnection at the Western Farmers Electric Cooperative transmission line where the electricity is then delivered to the Southwest Power Pool (SPP) grid. The Project Activity's intent is to generate electricity from renewable sources and therefore displace electricity that otherwise would have been produced for or distributed to the SPP grid in the absence of the Project Activity.

2. VERIFICATION PROCESS

2.1 Method and Criteria

The CRA Project Team has assessed and verified that the implementation of the Project Activity and the steps taken to report emission reductions comply with the VCS criteria and relevant guidance provided by the VCS and the UNFCCC. The verification included a review of relevant documentation, records, and an on-site visit.

CRA followed a risk-based verification approach. As such, CRA identified the key reporting risks related to the claimed emission reductions and assessed to what extent the project's control systems are adequate for mitigating any perceived reporting risks.

Key reporting risks that are not sufficiently addressed by the project control system represent residual risks. The CRA Project Team conducted detailed verification/testing to investigate the residual risks. Key issues assessed during verification included: verification of correct use of emission factors, accurate fuel consumption estimates, correct use of conversion factors, and consistency in aggregation of emissions data, as applicable. Wherever practical, direct reading instruments are preferred to be used to ensure that any reporting risks are kept with equipment and instrumentation performance limits.

The CRA Project Team ranked reporting risks and assessed the control systems implemented to mitigate these risks. The ranks are assigned as follows:

- **Fully Implemented** - All best practice expectations are implemented, resulting in a low risk
- **Partially Implemented** - A portion of the best practice expectations are implemented, resulting in a moderate risk
- **Limited Implementation** - Few or none of the expected system components or best practice expectations are implemented, resulting in a high risk

During the verification process, the CRA Project Team considered both quantitative and qualitative information on emission reductions. Quantitative data was comprised of the monitoring report and accompanying information submitted to the CRA Project Team by the Project Proponent/Client. Qualitative data was comprised of information on internal management controls, calculation procedures, and procedures for transfer, frequency of emissions reports, and review and internal audit of calculations/data transfers.

The audit conclusion was based on the interaction of three key verification principles as follows:

1. Compliance with the monitoring plan
2. Accuracy
3. Quality of evidence

During the desk review, the CRA Project Team became familiar with the Project Activity in order to be able to compare the situation and status on site with the situation as described in the underlying documentation. The CRA Project Team reviewed the following items:

- Review of the data and information presented to verify completeness
- Review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures
- Evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions
- Review of the last revision of the previous verification and validation reports (as applicable)
- Review of the written management manual (as applicable)
- Review of operation licenses from local authorities (as applicable)

Other documents such as process flow diagrams, technical drawings, manuals of equipment suppliers, and performance records were reviewed, if applicable to the Project Activity.

The CRA Project Team will use a risk-based approach for on-site investigation conducted during the verification process. The Lead Auditor and other Project Team members followed the audit trails and data sets on site for specific indicators, and cross checked with the monitoring plan and records. Direct reading instrumentation and redundancy in the data used to support the verification was identified in the verification reporting.

During the on-site assessment, the CRA Project Team focused on the key areas identified as follows:

- An assessment of the implementation and operation of the VCS Project Activities as per the registered VCS PD
- A review of information flows for generating, aggregating, and reporting the monitoring parameters
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the monitoring plan in the VCS PD
- A cross-check between information provided in the monitoring report and data from other sources such as plant log books, inventories, purchase records, or similar data sources
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the VCS PD and the selected methodology
- A review of calculations and assumptions made in determining the GHG data and emission reductions
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters

The outcome of the on-site assessment and the desk-top review was the creation of a Draft Findings Assessment. The Draft Findings Assessment was issued to the Project

Proponent/Client for response to any corrective actions or clarification requests. Upon receipt of the Project Proponent's/Client's response to these requests, the CRA Project Team prepared a Draft Verification Report. The CRA Independent Technical Reviewer completed a peer review of this Draft Verification Report. Any additional findings were presented to the Project Proponent/Client. Upon receipt of the Project Proponent's/Client's response, the CRA Project Team will issued a Final Verification Report along with a completed Verification Statement and Verification Representation.

2.2 Verification Team

The following presents the members of the CRA Project Team assembled for the verification of the registered VCS Project Activity:

CRA Project Team Position

Lead Auditor/Technical Expert
Validation Team Member
Lead Auditor Under Training
Independent Technical Reviewer

CRA Project Team Member

Brent Boss, P. Eng.
Adam Loney, P. Eng.
Valerie Chan, P. Eng.
Gordon Reusing, M.A.Sc., P. Eng.

Curricula vitae for each of the CRA Project Team Members have been provided as Annex C of this report.

2.3 Document Review

The VCS verification process relies heavily upon documentation review. The primary document for review is the VCS Monitoring Report. The Project Proponent provided CRA with the VCS Monitoring Report and revised VCS Monitoring Reports as detailed below:

<i>Document Date</i>	<i>Date Issued to CRA</i>	<i>Version Number</i>	<i>Methodology</i>
12 March 2013	13 March 2013	1	ACM0002, Ver. 09.0
16 April 2013	16 April 2013	2	ACM0002, Ver. 09.0
22 April 2013	22 April 2013	3	ACM0002, Ver. 09.0

Each of the above submissions was reviewed by CRA. As part of the verification process, additional documentation supplemental to the VCS Monitoring Report was requested and reviewed by CRA. This supplemental information included the following documents:

<i>Issued to CRA Date</i>	<i>Type of Document</i>
13 March 2013	• VCS Monitoring Report, "Fourth Monitoring Report" Version 1, dated 12 March 2013 • Northfork Electric Cooperative Inc. consumption invoices for January to December 2012 • Red Hills Wind Project LLC Billing Invoices to WFEC for January to December 2012 • Check versus Meter of Record_V1_2012, Microsoft Excel file • Final Monitoring Report Calculation of VER's No Partial Tons 2012, Microsoft Excel file
19 March 2013	• Acciona 2012 maintenance activity log • Copies of Lockout-Tagout/Electrical Safety Quiz – records of 2012 training for 16 employees • Copy of Event or Drill Evaluation, completed on 06 November 2012
16 April 2013	• VCS Monitoring Report, "Fourth Monitoring Report" Version 2, dated 16 April 2013 • 24 October 2012 meter test report • Hourly raw meter data recorded by the revenue meter • Summary of Capacity Factor and Turbine Availability
22 April 2013	• VCS Monitoring Report, "Fourth Monitoring Report" Version 3, dated 22 April 2013 • Revised Summary of Capacity Factor and Turbine Availability • Generator Attestation Form, dated 13 June 2012 • Generator Attestation form for third quarter of 2012, undated • Generator Attestation Form, dated 17 April 2013

2.4 Interviews

CRA completed a Site Inspection for the verification on 19 March 2013. During this portion of the verification process, CRA was able to interview a series of project stakeholders regarding various aspects of the Project Activity. Mr. Brent Boss and Ms. Valerie Chan of CRA completed the Site Inspection. The following Project Stakeholders were interviewed by CRA:

<i>Name of Interviewee</i>	<i>Position and Company</i>	<i>Details of Items Discussed</i>
Mr. Richard Ross	Manager – Risk Management – Western Farmers Electric Cooperative	Represented WFEC on the Site and assisted in conducting Site Visit tour. Discussed technical details of the Project Activity implementation and operation and Monitoring Report details.

<i>Name of Interviewee</i>	<i>Position and Company</i>	<i>Details of Items Discussed</i>
Mr. Robert LeForce	Environmental Specialist	Represented WFEC on the Site and assisted in conducting Site Visit tour. Discussed technical details of the Project Activity implementation and operation and Monitoring Report details.
Mr. Jeremy Retzlaff	Red Hills Wind Farm Site Manager – Acciona Energy North America	Represented the Project Proponent on the Site as well as discussions regarding operations of the Project Activity.

2.5 Site Inspections

The verification process is primarily a document review process. The completion of a Site Inspection provided the CRA Project Team with an added level of assurance that the information provided within documentation from the Project Proponent is complete and accurate as it relates to the registered Project Activity. As stated above, CRA completed a Site Inspection for the validation on 19 March 2013. Aside from interviewing project stakeholders as per Section 2.4 of this report, the CRA Project Team reviewed the implementation status of the Project Activity. During the Site Inspection the CRA Project Team noted that there were a total of 82 installed turbines. At the time of the Site Inspection, 82 turbines were installed. Eighty were operational and the remaining two turbines were inactive due to maintenance. The turbines were in compliance with the registered VCS PD. The implementation status of the Project Activity will be discussed in Section 3.1 below.

2.6 Assessment Against VCS Requirements

This Project Activity was assessed by CRA's Project Team versus the approved consolidated large-scale methodology entitled "Consolidated baseline methodology for grid-connected electricity generation for renewable sources", Version 09 (ACM0002), associated methodological tools referenced within the registered VCS PD, and relevant VCS and CDM guidance documentation.

Findings were categorized as either a Corrective Action Request (CAR), Forward Action Request (FAR), or as a Clarification Request (CL).

The CRA Project Team raised CARs in this Assessment if:

- The Project Proponent/WFEC made mistakes in assumptions or in the project documentation that will directly influence project results
- The requirements deemed relevant for validation of a Project Activity with certain characteristics have not been met
- There is a risk that the project emission reductions cannot be monitored, calculated, verified, and/or certified

- The Project Proponent/WFEC made mistakes that will influence the ability of the Project Activity to achieve real, measurable additional emission reductions
- The VCS/CDM requirements have not been met

FARs were issued to highlight issues related to project implementation that require review during subsequent verifications of the Project Activity. FARs will not relate to the VCS/CDM requirements for issuance and thus do not require any formal response from the Project Proponent/WFEC.

CLs were issued to the Project Proponent/WFEC if the CRA Project Team determined that the information provided by the Project Proponent/WFEC was insufficient, unclear or not transparent enough to establish whether the applicable requirements are met.

2.7 Resolution of Any Material Discrepancy

Each CAR, FAR, and CL raised by CRA was presented in individual tables within the Findings Assessment. The Project Proponent/WFEC was required to complete the appropriate responses and to provide, where necessary, documentation as evidence of their assumptions and/or responses.

A summary of the final results of the findings assessments is presented as follows:

<i>Finding Category</i>	<i>Number of Findings</i>
CAR	6
FAR	0
CL	<u>3</u>
Total	9

Section 3.0 of this report will provide the details of the individual findings and the responses from the Project Proponent/WFEC pertaining to each of the findings.

No material discrepancies were observed by CRA in the validation of the Project Activity.

2.8 Internal Quality Control and Technical Review

Upon completion of the verification assessment, and recommendation by the CRA Project Team, all Project Activity related materials were sent to the Independent Technical Reviewer. The Independent Technical Reviewer checked that the proper procedures have been followed and that all of the conclusions made by the CRA Project Team are just. Ultimately, the Independent Technical Reviewer issued an approval notice to the CRA Project Team based on their review. During review the Independent Technical Reviewer and the CRA Project Team were able to raise additional findings at which point the Project Proponent/WFEC must sufficiently address each of the additional findings should they occur. All findings were successfully closed by the Project Proponent/WFEC.

Documents provided to CRA by the Project Proponent/WFEC are filed according to the date received and the source of the information. All documentation is placed in a private, secure filing system with restricted access to safeguard confidentiality.

3. VERIFICATION FINDINGS

The following sections will detail the verification requirements as established by the CRA Project Team throughout the duration of the verification process.

3.1 Project Implementation Status

The Project Activity received its Validation Representation with the VCS dated 18 November 2009 as a Renewable Energy Industries type project under Sectoral Scope 1 defined by the UNFCCC and adopted by the VCS. The Project Activity was registered utilizing the approved consolidated large-scale methodology entitled "Grid connected electricity generation from renewable sources", Version 09 (ACM0002) with a renewable crediting period of 10 years commencing on 11 November 2008 and concluding on 10 November 2018.

During the verification, a Site Visit was conducted of which Project Activity implementation status was reviewed. The following paragraphs outline the information that was confirmed regarding the implementation status of the Project Activity.

The Project Activity's intent is to generate electricity from renewable sources and therefore displace electricity that otherwise would have been produced for or distributed to the SPP grid in the absence of the Project Activity.

The Project Activity is located over approximately 5,000 acres with the grid connection point geographic coordinates are as follows:

Latitude: 35.5° N
Longitude: -99.4° W

The Project Activity achieves GHG emissions reductions through the installation and operation of 82 Acciona Windpower AW-77/1500, 1.5 MW turbines for a total rated nameplate capacity of 123 MW. The turbines are located over an area of approximately 5,000 acres of rural and agricultural/grazing lands. Electricity generated by the turbines is upgraded from a 34.5 kilovolt (kV) collection line rating to a 138 kV rating at the Project Activity's substation and then transferred via transmission line to the point of interconnection at the Western Farmers Electric Cooperative transmission line where the electricity is then delivered to the Southwest Power Pool (SPP) grid.

The CRA Project Team confirmed the implementation status of the Project Activity during the Site Visit and confirmed the following details:

- At the time of the Site Visit there were 82 erected turbines capable of operation with a total nameplate capacity of 123 MW
- Regular maintenance activities to replace various turbine parts is executed as required throughout the year. Operating issues related to malfunctioning gear boxes in 12 of the turbines were noted in 2012; 1 was not repairable and 11 were repaired.

- A sub-station insulator failure resulted in 2 days of downtime during August 2012. There was low wind resource during that time. Other than this downtime, turbine operations were not affected outside of regular maintenance and normal troubleshooting.
- Monitoring of required parameters as per the approved Monitoring Plan is conducted via two electricity meters; a revenue meter and the check meter. The revenue meter is owned by WFEC and the check meter is owned by the Project Proponent. Each meter monitors the net electricity generated as per the approved Monitoring Plan. The revenue meter, as per the signed interconnection agreement, is the meter of record. The Project Proponent does not have access to the revenue meter.

No material discrepancies were noted between the Project Activity and the Project Description.

3.1.1 Phased Implementation Delays

The CRA Project Team noted that the Project Activity was registered to operate a total of 82 wind turbines. During the completion of the site visit, the CRA Project Team noted that the Project Activity was fully implemented with a total of 82 turbines installed. As such no phased implementation delays were evident.

3.1.2 Remaining Items From Validation and Previous Verification

The CRA Project Team assessed the Validation Report presented on the VCS website in regards to the registration of the Project Activity as well as the first, second, and third Verification Reports, as this Verification Report is for the fourth consecutive monitoring period of the Project Activity. Upon review of the aforementioned reports the CRA Project Team determined that there are two FARs raised during the first and third verifications. FAR #1 was raised in the Verification Report for the first monitoring period, and was closed out in the Second Verification Report.

FAR #2 was presented in the third Verification Report:

'The Interconnection Agreement dated 01 July 2004 states "if the measurement made by Metering Equipment during a test varies by more than two percent from the measurement made by the standard meter used in the test, Transmission Provider shall adjust the measurements by correcting all measurements for the period during which Metering Equipment was in error by using Interconnection Customer's check meters, if installed."

The error class reported in the technical specifications of the Revenue and Check Meters differ from the tolerable error allowed during meter testing as quoted in the Interconnection Agreement. Error to date has been noted at not more than an annual aggregate of +/- 0.1 percent. In order to maintain transparency, the CRA Project Team request that for future verifications, if the error identified during accuracy tests is greater than 0.2 percent (the error class of the Meters), then the appropriate corrective actions must be taken irrespective of the Interconnection Agreement terms.'

On 19 March 2013, the CRA Project Team and WFEC discussed FAR #2 during the Site Inspection. WFEC informed the CRA Project Team that, should a meter be out of tolerance

based on the 0.2 percent value listed in the Interconnection Agreement, the meter will be replaced. WFEF would notify the Project Proponent should any meter replacements be required. FAR #2 is Closed Out for this monitoring period.

3.2 Accuracy of GHG Emission Reduction or Removal Calculations

3.2.1 Monitoring Parameters

The following is a list of monitoring parameter(s) that the Project Proponent measured and recorded in order to calculate the claimed emission reductions throughout the Monitoring Period:

<i>Symbol</i>	<i>Monitoring Parameter Description (Units)</i>	<i>Frequency</i>
EG _y	Electricity supplied to the SPP (MWh)	Continuous/Real-Time (electricity meter)
TEG _y	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads (MWh)	Continuous/Real-Time (electricity meter)

Upon review of the approved methodology, ACM0002, Version 09, the CRA Project Team has determined that previous verifications of the Project Activity applied a conservative factor in calculation of total emission reductions. As per ACM0002, Version 09, the Project Proponent is only required to monitor the electricity supplied to the grid. Later versions of the methodology were updated to include the electricity back-fed into the Project Activity via the parameter termed as "net electricity supplied to the grid". The monitoring of TEG_y in accordance with the approved methodology is applicable only to hydro power plants in order to measure internal loads. However; as the precedent was set at the time of validation in addition to the first verification, WFEF has applied the consumption emissions in order to obtain net electricity generated. It is the CRA Project Team's determination that this inclusion provides a conservative estimate of the total emission reductions. No RECs were sold in 2012 and all emission reductions are being claimed as VCUs.

3.2.2 Methods for Recording Monitoring Parameters

Emission reductions regarding this Project Activity are entirely dependent upon the direct measurement of the electricity both supplied and taken from the SPP grid which combines to form the net electricity generated. The net electricity generated is measured directly at the point of interconnection to the SPP grid at the WFEF substation. Located within this substation are two separate electricity meters; the revenue (main) meter and the check meter. The revenue meter is owned by WFEF and the check meter is owned by the Project Proponent. Each of the meters is classified as a bi-directional meter in that they record electricity supplied to, and taken from, the grid. Invoices tracking these electricity records were made available by the Project Proponent and WFEF as will be discussed in Section 3.3. Net electricity generated is recorded in the units of MWh.

WFEC records the net electricity generation of the Project Activity through the use of the revenue meter as stated above. The Project Proponent reviews the provided WFEC revenue meter values against their check meter values on a monthly basis. Invoices are provided from the Project Proponent to WFEC on a monthly basis stating the quantity of electricity supplied to the SPP grid. The Project Proponent utilizes the data from the check meter in comparison to the revenue meter data supplied by WFEC to confirm the invoice quantities. Once the invoices are confirmed and any reconciliation is made, the appropriate payments are made.

All data parameters recorded by the revenue meter are accessed only by the WFEC personnel. The Project Proponent personnel are able to access the check meter data via wireless interface. Additionally, the Project Proponent utilize a Supervisory Control and Data Acquisition (SCADA) System to record only electricity output from the project substation. The Project Proponent accesses this information through the System Operations Centre, located in Chicago. The Project Proponent then correlates the data on a monthly basis and invoices WFEC for the electricity input into the grid. The total amount of electricity back fed in to the Project Activity is invoiced separately to the Project Proponent from Northfork Electric Cooperative Inc. on a monthly basis.

It is the CRA Project Team's opinion that methods employed by the Project Proponent and WFEC meet the requirements of the registered VCS PD and the associated approved methodology and additionally provide a level of redundancy with the monitoring of net electricity generated with two separate meters.

3.2.3 Calculation of Emission Reductions

The value of net electricity supplied to the grid once obtained, are then multiplied by the grid emission factor that was established as an ex-ante parameter during the validation stage and therefore is only required to be updated upon renewal of the crediting period. The grid emission factor established for this initial crediting period is 0.67 tCO₂/MWh. As the Project Activity is displacing only carbon dioxide emissions from electricity production the resulting number value is then multiplied by the global warming potential of carbon dioxide as follows:

- $GWP\ CO_2 = 1\ tCO_2e/1\ tCO_2$

The calculations used to determine the overall emission reductions as applied to the Microsoft Excel spreadsheet provided by WFEC are as follows:

Total Emission Reductions Calculation:

$$ER_y = BE_y - PE_y - L_y$$

Where:

- BE_y = Total baseline emissions (tCO₂e)
- PE_y = Total project emissions (tCO₂e)
- L_y = Total leakage emissions (tCO₂e)

Baseline Emissions Calculations:

$$BE_y = EG_y * EF_{grid,CM,y}$$

Where:

EG_y = Net electricity supplied to the grid by the Project Activity (MWh)

$EF_{grid,CM,y}$ = Ex-ante grid emission factor (0.67 tCO₂/MWh)

The net electricity generated (EG_y) is calculated through the subtraction of the total electricity produced by the Project Activity (TEG_y) from the electricity consumed from the grid. As mentioned previously this measurement is completed through the use of bi-directional electricity meters and is confirmed through the review of invoices.

Project Emissions Calculations:

Project emissions are not quantified or required to be quantified based on the registered VCS PD and the approved methodology.

Leakage Emissions Calculations:

Leakage emissions are not quantified or required to be quantified based on the registered VCS PD and the approved methodology.

3.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

Through the verification process, the CRA Project Team has raised several corrective action and clarification requests to WFEC in order to request evidence to support the emission reductions claims made in the Monitoring Report. These requests were provided to WFEC in order to ensure the relevance, consistency, transparency, completeness, accuracy, and conservativeness of the statements and calculations made. These requests are detailed in CAR #3, CL #2, and CL #3.

Date:	19/03/2013		Raised by:	Brent Boss/Valerie Chan	
Type:	CAR	Number:	#3	Reference:	3.3
Lead Auditor Comment:					
In Section 3.16.5 of the VCS Standard Version 3.3, it states that <i>"Where measurement and monitoring equipment is used, the Project Proponent shall ensure the equipment is calibrated according to the equipment's specifications and/or relevant national or international standards."</i> During the Site visit, the Project Proponent indicated that the Meter of Record was tested on 24 October 2012. Additionally, the Project Proponent referenced generator attestation form(s). In order to ensure the accuracy of the metered readings, the CRA Project Team requests that the Project Proponent provide copies of the referenced documents.					
Project Proponent Response:				Date: 16/04/2013	
The 24 October 2012 test has been referenced in Section 3.3 of the Fourth Monitoring Report Version 2.					
Documentation Provided by Project Proponent:					
Electronic version of the 24 October 2012 meter test report was submitted electronically. Version 2 of the Fourth Monitoring Report was submitted electronically.					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that the Fourth Monitoring Report Version 2 was provided with reference to the 24 October 2012 meter test, and the 24 October 2012 test report for meter of record serial number 82093242 was provided. The generator attestation form(s) were not provided.					
Reasoning for non-Acceptance:				Date: 17/04/2013	
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding has not been closed out. The Project Proponent specified the testing dates for the Meter of Record in Monitoring Report Version 2, and provided a copy of the 24 October 2012 meter test report; however, the Project Proponent did not provide the generator attestation form(s). The CRA Project Team requests that the Project Proponent provide the evidence of testing in accordance with Section 3.16.5 of the VCS Standard Version 3.3.					
Project Proponent Response:				Date: 22/04/2013	
The generator attestation form(s) were provided electronically via email to Conestoga-Rovers & Associates 22 April 2013.					
Documentation Provided by Project Proponent:					
Provided electronically – Generator Attestation Red Hills 1st. Qtr 2012.pdf; Generator Attestation Red Hills 3rd Qtr 2012.pdf; Generator Attestation Red Hills 2nd Qtr and 4th Qtr 2012.pdf					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that the generator attestation forms have been provided.					
Reasoning for Acceptance and Close Out:				Date: 25/04/2013	
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding has been closed out. The Project Proponent provided the CRA Project Team with generator attestation forms and the 24 October 2012 test report for the Meter of Record serial number 82093242, in accordance with the requirements of Section 3.16.5 of the VCS Standard Version 3.3.					
CAR #3 is Closed Out.					
Acceptance and Close out by Lead Auditor:				Date: 25/04/2013	

Date:	19/03/2013	Raised by:	Brent Boss/Valerie Chan		
Type:	CL	Number:	#2	Reference:	4
Lead Auditor Comment:					
In order to maintain consistency and completeness, the CRA Project Team request that the Project Proponent provide all raw data (i.e., hourly metered data) recorded by the Revenue Meter (Meter of Record) including consumption data such that the calculations may be fully reproduced.					
Project Proponent Response:				Date: 16/04/2013	
We understand the request and will be submitting the raw (hourly) meter data					
Documentation Provided by Project Proponent:					
Hourly raw meter data was submitted electronically.					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that the hourly raw meter data was provided. The Emission Reductions value presented in Section 4.4 was confirmed by the CRA Project Team by reproducing the calculations. Two minor inconsistencies were found in the data set: • One line of data is missing for 11 March 2012 at 3:00 a.m. • Two lines of data are included for 4 November 2012 at 2:00 a.m. These two minor inconsistencies were determined to be the result of time changes due to daylight savings time and were found to have no significant effect on the overall calculations.					
Reasoning for Acceptance and Close Out:				Date: 17/04/2013	
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding was closed out. The Project Proponents provided the CRA Project Team with the raw hourly data for the Meter of Record. The CRA Project Team reproduced the emission reduction calculations using the raw data provided and found a +0.0002 percent difference in the emission reduction values, which is less than the materiality threshold of 5 percent. <u>CL #2 is Closed Out.</u>					
Acceptance and Close out by Lead Auditor:				Date: 17/04/2013	

Date:	19/03/2013	Raised by:	Brent Boss/Valerie Chan		
Type:	CL	Number:	#3	Reference:	4
Lead Auditor Comment:					
During the Site visit, the CRA Project Team noted that the overall capacity factor at the substation was record as approximately 41 percent, and the turbine availability was 96.9 percent for the 2012 reporting year, as recorded by the Project Operators SCADA system. While this value does not include transmission losses or consumption information, this value is a useful check in regards to the overall transmission losses and resulting emission reductions. In order to maintain transparency, the CRA Project team is requesting the Project Proponent provide the SCADA system report summarizing the 2012 reporting year.					
Project Proponent Response:				Date: 16/04/2013	
Summary of Capacity Factor and Turbine Availability was requested from Acciona site Manager.					
Documentation Provided by Project Proponent:					
Summary of Capacity Factor and Turbine Availability was submitted electronically.					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that the Summary of Capacity Factor and Turbine Availability, with the header date of January 1, 2012 was provided.					
Reasoning for non-Acceptance:				Date: 17/04/2013	
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding has not been closed out. The header date of January 1, 2012 on the provided Capacity Factor and Turbine Availability Report leads the CRA Project Team to believe that the 'Year to Date' values would be for January 1, 2011 to December 31, 2011. The CRA Project Team request that the Project Proponent verify that the Capacity Factor and Turbine Availability Report from Acciona Energy providing the year to date production, capacity factor and availability values for the 1 January 2012 to 31 December 2012 time period.					
Project Proponent Response:				Date: 22/04/2013	
A revised spreadsheet reporting the Capacity Factor and Turbine Availability Report clearly labeled 1 January 2012 to 31 December 2012 was requested from Acciona. Acciona sent it electronically to Western Farmers Electric Cooperative and Conestoga-Rovers and Associate 22 April 2013.					
Documentation Provided by Project Proponent:					
Electronic delivery Turbine Capacity Factor and Turbine Availability for period 1 January 2012 through 31 December 2012.					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that the Summary of Capacity Factor and Turbine Availability for period 1 January 2012 through 31 December 2012 was provided.					
Reasoning for Acceptance and Close Out:				Date: 25/04/2013	

Date:	19/03/2013		Raised by:	Brent Boss/Valerie Chan	
Type:	CL	Number:	#3	Reference:	4
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding was closed out. The Project Proponent provided the CRA Project Team with a SCADA report for the 2012 monitoring period. The CRA Project Team utilized the information contained in the SCADA report as an additional check and found a -0.14 percent difference in the emission reduction values, which is less than the materiality threshold of 5 percent.					
<u>CL #3 is Closed Out.</u>					
Acceptance and Close out by Lead Auditor:				Date: 25/04/2013	

Further to the above, corrective action and clarification requests were made to ensure the accuracy of the Fourth Monitoring Report for the Red Hill Wind Project. These requests are detailed in CAR #1, CAR #2, CAR #4, CAR #5, CAR #6, and CL #1.

Date:	19/03/2013	Raised by:	Brent Boss/Valerie Chan		
Type:	CAR	Number:	#1	Reference:	3.3
Lead Auditor Comment:					
Section 3.3 of the Monitoring Report references methodology ACM0002 Version 10.					
The CRA Project Team is requesting that the 2012 Monitoring Report correctly reference and apply the appropriate version of UNFCCC methodology ACM0002, as per the registered VCS Project Description (VCS PD), dated November 2008 in order to maintain consistency.					
Project Proponent Response:				Date: 16/04/2013	
The correct reference to methodology ACM0002 Version 09 has been entered in Version 2 of the Fourth Monitoring Report.					
Documentation Provided by Project Proponent:					
Version 2 of the Fourth Monitoring Report was submitted electronically.					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that the Fourth Monitoring Report Version 2 was provided with correct references and application of UNFCCC methodology ACM0002.					
Reasoning for Acceptance and Close Out:				Date: 17/04/2013	
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding was closed out. The CRA Project Team confirmed that references to the version of the applied methodology ACM0002 specified in the registered VCS PD and Fourth Monitoring Report were consistent.					
<u>CAR #1 is Closed Out.</u>					
Acceptance and Close out by Lead Auditor:				Date: 17/04/2013	

Date:	19/03/2013	Raised by:	Brent Boss/Valerie Chan		
Type:	CAR	Number:	#2	Reference:	2.2 and 4.4, Title page
Lead Auditor Comment:					
Sections 2.2 and 4.4 of the Monitoring Report indicate the monitoring period as 1 January 2011 to 31 December 2011. The monitoring period of 1 January 2011 to 31 December 2011 has been verified as detailed in the Verification Report Version 3, issued by CRA on 15 February 2013. The CRA Project Team request that the Project Proponent revise the Monitoring Report to indicate the correct and current monitoring period. Additionally, the format for the Monitoring Period on the title page is specified by VCS in the template as "DD-Month-YYYY to DD-Month-YYYY". The dates on the title page of the Project Proponent's Fourth Monitoring Report Version 1 are "01-01-2012 to 31-12-2012". The CRA Project Team request that the Project Proponent revise the monitoring period listed in accordance with VCS specifications.					
Project Proponent Response:				Date: 16/04/2013	
The dates in Sections 2.2 and 4.4 of the Fourth Monitoring Report Version 2 have been corrected to 1 January 2012 to 31 December 2012.					
Documentation Provided by Project Proponent:					
Version 2 of the Fourth Monitoring Report was submitted electronically.					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that the Fourth Monitoring Report Version 2 was provided with corrected references for the Monitoring Period in Sections 2.2 and 4.4.					
Reasoning for non-Acceptance:				Date: 17/04/2013	
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding has not been closed out.					
The Project Proponent's reference to the Monitoring Period on the title page of the Fourth Monitoring Report is incorrectly formatted as "01-01-2012 to 31-12-2012"(i.e., DD-MM-YYYY). The CRA Project Team requests that date formats utilized in project documents be of the format DD-Month-YYYY, in accordance with VCS specifications.					
Project Proponent Response:				Date: 22/04/2013	
The format of the Monitoring Period on the title page of the Fourth Monitoring Report Version 3 dated 22 April 2013 was changed as requested.					
Documentation Provided by Project Proponent:					
Fourth Monitoring Report Version 3 dated 22 April 2013					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that the Fourth Monitoring Report Version 3 was provided with the correct date formats on the title page.					
Reasoning for Acceptance and Close Out:				Date: 25/04/2013	

Date:	19/03/2013		Raised by:	Brent Boss/Valerie Chan		
Type:	CAR	Number:	#2		Reference:	2.2 and 4.4, Title page
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding has been closed out. The CRA Project Team confirmed that the Fourth Monitoring Report Version 3 contained correct references to the applicable fourth monitoring period, and that date formats in the Monitoring Report were in accordance with VCS specifications.						
<u>CAR #2 is Closed Out.</u>						
Acceptance and Close out by Lead Auditor:				Date: 25/04/2013		

Date:	19/03/2013		Raised by:	Brent Boss/Valerie Chan		
Type:	CAR	Number:	#4	Reference:	1.1	
Lead Auditor Comment:						
Section 1.1 of the Fourth Monitoring Report includes a section detailing "Technology employed by the project activity". The description is written in future tense, indicating that the project activity has not yet been implemented. The CRA Project Team request that the text be rewritten in present or past tense, as appropriate.						
Project Proponent Response:				Date: 16/04/2013		
The tense in the Section 1.1in Version 2 of the Fourth Monitoring Report has been changed to present or past tense as appropriate.						
Documentation Provided by Project Proponent:						
Version 2 of the Fourth Monitoring Report was submitted electronically.						
Information Verified by Lead Auditor:						
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that an updated Fourth Monitoring Report was provided with Section 1.1 updated to use present or past tense as appropriate.						
Reasoning for Acceptance and Close Out:				Date: 17/04/2013		
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding was closed out. Following a review of the Fourth Monitoring Report Version 2, the CRA Project Team confirmed that descriptions of the technology employed by the project activity reflected actual conditions.						
<u>CAR #4 is Closed Out.</u>						
Acceptance and Close out by Lead Auditor:				Date: 17/04/2013		

Date:	18/04/2013		Raised by:	Brent Boss/Valerie Chan		
Type:	CAR	Number:	#5		Reference:	4.4
Lead Auditor Comment:						
Section 4.4 of the Fourth Monitoring Report includes the text "Total emission reductions during the monitoring period were 142,721 tn CO ₂ ". The emission reductions amount in the text does not match the amount stated elsewhere in the Fourth Monitoring Report.						
The CRA Project Team requests that the Project Proponent ensure the emission reduction values are consistent with the amounts calculated.						
Project Proponent Response:				Date: 22/04/2013		

Date:	18/04/2013	Raised by:	Brent Boss/Valerie Chan		
Type:	CAR	Number:	#5	Reference:	4.4
Total emission reductions during the monitoring period reported in the text of Section 4.4 was changed to 287,641 tn CO ₂ .					
Documentation Provided by Project Proponent:					
Fourth Monitoring Report Version 3 dated 22 April 2013.					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that an updated Fourth Monitoring Report was provided with Section 4.4 updated with the correct emission reductions amount.					
Reasoning for Acceptance and Close Out:				Date: 25/04/2013	
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding was closed out. The CRA Project Team confirmed that the emission reductions claimed in the Fourth Monitoring Report Version 3 were consistent with the emission reductions calculated by the Project Proponent.					
<u>CAR #5 is Closed Out.</u>					
Acceptance and Close out by Lead Auditor:				Date: 25/04/2013	

Date:	18/04/2013	Raised by:	Brent Boss/Valerie Chan		
Type:	CAR	Number:	#6	Reference:	4.4
Lead Auditor Comment:					
Section 4.4 of the Fourth Monitoring Report includes a table with a line item labeled " <i>Estimated reduction for the period</i> " specifies units of " <i>tCO2 for the 580 days</i> ".					
The CRA Project Team requests that the Project Proponent ensure that the emission units of " <i>Estimated reduction for the period</i> " reflects the number of days of the monitoring period.					
Project Proponent Response:				Date: 22/04/2013	
The emission units of line item, "Estimated reduction for the period" was changed from 580 days to 366 days.					
Documentation Provided by Project Proponent:					
Fourth Monitoring Report Version 3 dated 22 April 2013.					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that an updated Fourth Monitoring Report was provided with Section 4.4 updated with the correct units for "Estimated reductions for the period" in the table.					
Reasoning for Acceptance and Close Out:				Date: 25/04/2013	
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding was closed out. The CRA Project Team confirmed that the information specified by the Project Proponent in Section 4.4 of the Fourth Monitoring Report Version 3 was correct based on the reporting period.					
<u>CAR #6 is Closed Out.</u>					
Acceptance and Close out by Lead Auditor:				Date: 25/04/2013	

Date:	19/03/2013	Raised by:	Brent Boss/Valerie Chan		
Type:	CL	Number:	#1	Reference:	1.6
Lead Auditor Comment:					
In Section 1.6 of the Fourth Monitoring Report, the Project Proponent states: <i>This is the Third Monitoring Report for the referred project activity. The final version (3) of the second monitoring report covered the period 1 June 2009 through 31 December 2010. The final version (2) of the first monitoring report covered the period 11 November 2008 through 31 May 2009.</i> The CRA Project Team request that the Project Proponent revise the text in Section 1.6 of the Monitoring Report to specify that it is the fourth monitoring report. The CRA Project Team requests that the Project Proponent revise Section 1.6 of the Monitoring Report to reference the final version of the third monitoring report for the period of 1 January 2011 through 31 December 2011 to maintain and present an accurate record of the past verifications.					
Project Proponent Response:				Date: 16/04/2013	
Section 1.6 of Version 2 of the Fourth Monitoring Report was changed to reference the period 1 January 2011 through 31 December 2011.					
Documentation Provided by Project Proponent:					
Version 2 of the Fourth Monitoring Report was submitted electronically					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that an updated Fourth Monitoring Report was provided with references to past Monitoring Reports changed in Section 1.6.					
Reasoning for non-Acceptance:				Date: 17/04/2013	
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding has not been closed out.					
The Project Proponent incorrectly referenced the Monitoring Period of the third monitoring report as "1 January 2012 through 31 December 2012" in Section 1.6. The CRA Project Team requests that the reference to the monitoring period for the third monitoring report be corrected.					
Project Proponent Response:				Date: 22/04/2013	
The reference to the monitoring period for the third monitoring report was changed to 1 January 2011 through 31 December 2011.					
Documentation Provided by Project Proponent:					
Fourth Monitoring Report Version 3 dated 22 April 2013					
Information Verified by Lead Auditor:					
The CRA Project Team reviewed the Project Proponent response and documentation provided, and confirmed that an updated Fourth Monitoring Report was provided with references to past Monitoring Reports changed in Section 1.6.					
Reasoning for Acceptance and Close Out:				Date: 25/04/2013	
Based on the finding raised and response provided by Project Proponent (based on the above evidences), the finding was closed out. The CRA Project Team confirmed that Section 1.6 of the Fourth Monitoring Report Version 3 contained correct information with regards to the monitoring periods and dates.					
<u>CL #1 is Closed Out.</u>					
Acceptance and Close out by Lead Auditor:				Date: 25/04/2013	

In accordance with Article 7, Section 7.4 of the Southwest Power Pool Interconnection Agreement for Gen-20002-005, Red Hills Wind Project, the Transmission Provider (SPP) is required to:

Inspect and test all Transmission Provider-owned Metering Equipment upon installation and at least once every two (2) years thereafter.

If Metering Equipment fails to register, or if the measurement made by Metering Equipment during a test varies by more than two percent from the measurement made by the standard meter used in the test, Transmission Provider shall adjust the measurements by correcting all measurements for the period during which Metering Equipment was in error by using Interconnection Customer's check meters, if installed. If no such check meters are installed or if the period cannot be reasonably ascertained, the adjustment shall be for the period immediately preceding the test of the Metering Equipment equal to one-half the time from the date of the last previous test of the Metering Equipment.

As previously discussed in Section 3.1.2, the CRA Project Team and WFEC discussed FAR #2 which addresses the discrepancy between the tolerable error allowed under Interconnection Agreement and the technical specifications for the meters. WFEC informed the CRA Project Team that, should a meter be greater than the 0.1 percent value listed in the Interconnection Agreement, the meter will be replaced. WFEC would notify the Project Proponent should any meter replacements be required.

The following summarizes the testing of Metering Equipment:

Meter	Serial #	Manufacturer Calibration Frequency	Interconnection Agreement Acceptance Test Frequency	Initial Factory Calibration Date	Accuracy Testing Date
Revenue Meter Manufacturer: Transdata Model: EMS-60 Error Class: +/- 0.2 percent	82093242	Calibration not required (digital device). Manufacturer does not specify frequency of accuracy checks.	Typically Annually but required once every 2 years at minimum	15 October 2008	24 October 2012, 28 December 2011 and 14 July 2010

<i>Meter</i>	<i>Serial #</i>	<i>Manufacturer Calibration Frequency</i>	<i>Interconnection Agreement Acceptance Test Frequency</i>	<i>Initial Factory Calibration Date</i>	<i>Accuracy Testing Date</i>
Check Meter Manufacturer: Power Logic Model: ION8600 Error Class: +/- 0.2 percent	LT-0808A309-01	Calibration not required (digital device). Manufacturer does not specify frequency of accuracy checks.	In accordance with Good Utility Practice	11 May 2009	N/A

Overall, the CRA Project Team has determined that the Project Proponent/WFEC has provided sufficient documentation as requested though the findings stated above. While not required for this Project Activity, the use of the check meter in relation to the revenue meter provides a further level of redundancy in the calculation of emission reductions and electricity sales.

3.3.1 Sampling of Data and Re-Calculation of Emission Reductions

The CRA Project Team requested a full data sampling regime from the Project Proponent/WFEC. Invoices for electricity supplied to the grid and electricity back-fed from the grid were provided during the verification process. Consolidated raw data of electricity meter readings was also provided to the CRA Project Team. The CRA Project Team then reviewed the provided emission reduction calculation spreadsheet against the requirements of ACM0002, Version 09. The CRA Project Team determined that the calculation spreadsheets were completed in compliance with the approved methodology. At the conclusion of the verification, the CRA Project Team was successfully able to replicate the emission reduction calculations based on data retrieved.

3.3.2 Comparison of Calculated Versus Projected Emission Reductions

The comparison between quantity of emission reductions calculated during the monitoring period and what was projected within the registered VCS PD are summarized in the table below:

<i>Time Period (equivalent)</i>	<i>Registered VCS PD (tCO₂e)</i>	<i>Monitoring Report (tCO₂e)</i>
01 January 2012 – 31 December 2012	293,839	287,641

The deviation in tCO₂e between the 2012 Monitoring Report and the projection in the Registered VCS PD is -2.1 percent. As the projected values in the registered VCS PD are based around many assumptions and other default inputs (i.e., wind patterns), it is difficult to accurately predict the emission reductions achievable during any given monitoring period. As a result, it is CRA's

opinion that the Project Activity has been implemented and operated as per the registered VCS PD.

3.4 Management and Operational System

The Project Proponent operates the Project Activity on a daily basis and is responsible for the performance, maintenance, and calibrations as required by the methodology and the established interconnection agreement. Redundancy in terms of monitoring is observed via the inclusion of two electricity meters; a revenue meter and the check meter. The revenue meter is owned by WFEC and the check meter is owned by the Project Proponent. Each meter monitors the net electricity generated as per the approved Monitoring Plan.

Ultimately, the management and operational system for the Project Activity is a robust and redundant system that leaves little room for error. Invoices are reviewed based on the records kept by each party involved and the discrepancies noted between the monitors were within the 0.2 percent allowable error tolerance.

Calibrations required as per the interconnection agreement for the revenue meter are completed by qualified personnel employed by WFEC. The Project Proponent operates the Project Activity daily operations according to the "Monitoring and Verification Manual for VCS Purposes" as approved during the validation stage of the Project Activity. The "Monitoring and Verification Manual for VCS Purposes" document outlines the Project Activity and the responsibilities for operations, monitoring the net electricity generation, the maximum permissible errors outlined for the electricity meters, calibration, and verification requirements.

It is the opinion of the CRA Project Team that the Project Activity and all parties involved have abided by the established procedures and responsibilities as laid out within the "Monitoring and Verification Manual for VCS Purposes" which establishes a sufficient management system as evidenced through the quality of reproducible and redundant data viewed during this verification.

4. VERIFICATION CONCLUSION

CRA was contracted by Western Farmers Electric Cooperative (Client) on behalf of Red Hills Wind Project, LLC (Project Proponent) to perform the second verification of the Red Hills 123 MW Wind Power Project in the State of Oklahoma, U.S.A.

As stated in Section 1.1, CRA as validator/verifier is responsible for reviewing the VCS Monitoring Report and any supporting documentation to ensure that the principles of VCS Program Guide, Version 3.4, and VCS Standard, Version 3.3 are met, specifically that the registered Project Activity has resulted in emission reductions that are:

- Relevant
- Complete
- Consistent
- Accurate
- Transparent
- Conservative

Verification Opinion

The verification was performed in accordance with the VCS Program Guide, Version 3.4, and VCS Standard, Version 3.3 in addition to the UNFCCC CDM methodology and associated methodological tools.

Through the construction of an 82 turbine wind power project with a total nameplate capacity of 123 MW, the registered Project Activity has resulted in a reduction of GHG emissions that are relevant, complete, consistent, accurate, transparent and conservative. Furthermore the emission reductions generated by the registered Project Activity have served to contribute to sustainable development, and resulted in long-term benefits to the mitigation of climate change.

Upon completion of the verification process it is the CRA Project Team's opinion that that all relevant VCS verification criteria have been satisfied. The registered Project Activity properly applies the criteria of ACM0002, Version 09. Within the VCS Monitoring Report it was demonstrated and confirmed by CRA that the Project Proponent/WFEC has applied the Monitoring Plan as per the requirements of the registered VCS PD. Therefore, it is CRA's opinion that the emission reductions attributable to the registered Project Activity during the fourth monitoring period are stated in a manner that is materially correct and is a fair representation of implemented Project Activity as per the VCS PD.

All CARs and CLs raised by CRA have been satisfactorily closed by the Client/Project Proponent. The claimed emission reductions have been reviewed by CRA for completeness, accuracy, and consistency. No cumulative errors were noted by the CRA Project Team and therefore no material errors were noted.

Based on the verification assessment performed, CRA is issuing a Positive Verification Opinion in regards to this Project Activity and will therefore recommend/certify that the registered Project Activity has obtained the reported emission reductions as follows:

Reporting period: From 01 January 2012 to 31 December 2012

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	287,641
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	287,641

Respectfully Submitted,

CONESTOGA-ROVERS & ASSOCIATES LIMITED



Brent Boss, P. Eng.



Valerie Chan, P. Eng.

ANNEX A: ABBREVIATIONS

ACM	Approved Consolidated Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
CO ₂ e	Carbon Dioxide Equivalent
CRA	Conestoga-Rovers & Associates Limited
DOE	Designated Operational Entity
FAR	Forward Action Request
GHG	Greenhouse Gas
kV	Kilovolt
MW	Megawatt
SCADA	Supervisory Control and Data Acquisition
SPP	Southwest Power Pool
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCS PD	Verified Carbon Standard Project Document
WFEC	Western Farmers Electric Cooperative

ANNEX B: VERIFICATION CHECKLIST

Project No.: 077717-02 Project Title: Red Hills 123 MW Wind Power Project
 Project Team: Brent Boss, Adam Loney, Valerie Chan, Gordon Reusing Date: 15 April 2013

Document (Desk) Review		Comments
(1) Ensure that the following documentation is in place and reviewed prior to the site visit:		
Monitoring report/documentation provided by the PP to ensure completeness and adequate frequency	☒	Fourth Monitoring Report Versions 1, 2, and 3 received as per Findings Assessments.
The registered PDD, including the monitoring plan and the validation report	☒	Available on the VCS website. CRA downloaded and reviewed them accordingly.
Previous monitoring and verification reports, if any (VCS Website)	☒	Available on the VCS website. CRA downloaded and reviewed them accordingly.
The applied monitoring methodology	☒	Available on the UNFCCC website. CRA downloaded and reviewed them accordingly.
Relevant decisions, clarifications and guidance from the VCSA	☒	None found.
Assess the quality control system that is responsible for safeguarding data	☒	Provided in PDD and further assessed during Site Visit.
Monitoring records that sustain claimed emission reductions	☒	Calculations and backup was provided by Project Proponent.
Any other information and relevant references on the project activity and project operator	☒	Interconnection Agreement and other documentation were provided both before and after the Site Visit.
(2) Ensure all FARs referenced in the validation report have been properly addressed during the monitoring period	☒	FAR#1 was properly assessed and is discussed in the Validation Report. FAR #2 was assessed and discussed in Section 3.1.2 of this Verification Report
(3) Ensure that the Monitoring Report received from the PP is made publicly available	☒	Not Applicable in this stage with the VCS.
ON-SITE ASSESSMENT		
(1) Prepare for on-site assessment by :		
Assessing relevant information and making a draft determination of the on-site audit activities	☒	Proposal and Validation Plan were prepared prior to Site Visit. Note this was third consecutive verification by CRA on this Site.
Organizing the logistical aspects of the visit, including the agenda and whom to interview	☒	Completed by Brent Boss and the Project Proponent.
(2) On-site assessment will consist of the following:		
An introduction meeting and explanation of objectives of the verification	☒	Completed at beginning of Site Visit with the Project Proponent and Project Stakeholders specified in Section 2.4 of the Verification Report.

Project No.: 077717-02 Project Title: Red Hills 123 MW Wind Power Project
 Project Team: Brent Boss, Adam Loney, Valerie Chan, Gordon Reusing Date: 15 April 2013

Document (Desk) Review		Comments
Interviews with relevant personnel at the site to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD	☒	Site Visit was conducted on 19 March 2013. See Section 2.4 of the Verification Report for details.
An assessment of the implementation and operation of the proposed VCS project activity as per the registered PDD or any approved revised PDD	☒	See Section 2.5 of the Verification Report for details.
A review of information flows for generating, aggregating, and reporting the monitoring parameters	☒	See Section 3.4 of the Verification Report for details.
A cross-check between information provided in the monitoring report and data from other sources such as plant log books, inventories, purchase records, or similar data sources	☒	See Section 3.3.1 of the Verification Report for details.
A check of the monitoring equipment including calibration certificates and performance and observations of monitoring practices against the requirements of the PDD and the selected methodology and the corresponding tool(s)	☒	See Section 3.3 of the Verification Report for details.
A review of calculations and assumptions made in determining the GHG data and emission reductions	☒	See Section 3.3.1 of the Verification Report for details.
An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters	☒	See Section 3.4 of the Verification Report for details.
Interviews with local project stakeholders, as applicable	☒	See Section 2.4 of the Verification Report for details.
Specific testing and calculation checks (done on high risk, material data sources, and data management issues)	☒	Most calculations were completed in CRA offices due to the nature of the monitoring parameters.
Close-out meeting presenting the results and findings	☒	Conducted at end of Site Visit.
Development of an agreement on next steps to close out CARs and FARs	☒	CRA completed this during the Site Visit and re-issued findings and Draft Verification Reports in conjunction with this timeline.
QUALITY OF EVIDENCE		
(1) Determine that there is a clear audit trail that demonstrates:		
Whether sufficient evidence is available, both in terms of frequency (time period between evidence) and coverage (in covering the full monitoring period)	☒	See Section 3.3 of the Verification Report for details.
The source and nature of the evidence (external or internal, oral or documented, etc.)	☒	See Section 3.3 of the Verification Report for details.
Cross-check the monitoring report against other sources such as comparable information, where available, from sources other than those used in the monitoring report to determine whether the stated figures are correct.	☒	See Section 3.3 of the Verification Report for details.

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(2) The DOE shall assess that the data collection system meets the requirements of the monitoring plan as per the applied methodology including applicable tool(s).	☒	See Section 3.3 of the Verification Report for details.
(3) The DOE shall only certify emission reductions that are based upon verifiable evidence	☒	See Section 3.3 and the Verification Opinion of the Verification Report for details.
CAR/FAR/CL		
(1) Raise a CAR if any of the following occur:		
Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient	☒	CAR #1 was raised as the wrong methodology version was referenced in the Monitoring Report initially.
Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants	☒	None raised/identified.
Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impair the estimate of emission reductions	☒	None raised/identified.
Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants	☒	None raised/identified.
(2) Raise a CL if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met	☒	In total three CLs were raised for various issues. See Section 3 of the Verification Report for details.
(3) All CARs and CLs raised during verification shall be resolved prior to submitting a request for issuance	☒	All closed out. See Section 4 of the Verification Report for details.
(4) Raise a FAR during verification for actions if the monitoring and reporting require attention and/or adjustment for the next verification period	☒	None raised/identified.
VERIFICATION OF SPECIFIC REQUIREMENTS		
(1) The following requirements should be assessed by the DOE:		
Determine whether the project activity has been implemented and operated as per the registered PDD or any approved revised PDD, and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place	☒	Implementation as per PDD. See Sections 3.1 and 3.1.1 of the Verification Report for details.
Determine whether the monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of VCUs, verifiable, and in accordance with applicable VCS requirements	☒	Documents found complete following resolution of applicable findings.
Determine whether actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan or any revised approved monitoring plan, and the approved methodology including applicable tool(s)	☒	Net electricity generation was monitored as per the requirements of the methodology and PDD.

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Evaluate the data recorded and stored as per the monitoring methodology including applicable tool(s)	☒	See Sections 3.2.3 and 3.3.1 of the Verification Report for details.
PROJECT IMPLEMENTATION		
(1) Identify any concerns related to the conformity of the actual project activity and operation with the registered project design document and determine whether: (a) The implementation and operation of the project activity has been conducted in accordance with the description contained in the registered PDD; or (b) Any deviation or the proposed or actual changes in the implementation or operation of the project activity comply with the requirements of the Project Standard	☒	Project implemented exactly as per PDD. See Sections 3.1 and 3.1.1 of the Verification Report for details.
(2) By means of an on-site visit, assess that all physical features of the proposed VCS project activity proposed in the registered PDD are in place and that the project participants have operated the proposed VCS project activity as per the registered PDD. If an on-site visit is not conducted, the DOE shall justify the rationale of the decision	☒	Project implemented exactly as per PDD. See Sections 3.1 and 3.1.1 of the Verification Report for details.
MONITORING PLAN AND MONITORING COMPLIANCE		
(1) Check the following regarding the monitoring plan:		
The monitoring plan is in accordance with the approved methodology applied by the registered VCS project or an approved revised PDD.	☒	Confirmed by CRA during Site Visit. See Section 3.2.1 of the Verification Report for details.
Verify that the validated monitoring plan is in accordance with the approved methodology applied by the proposed VCS project activity.	☒	Confirmed by CRA during Site Visit. See Section 3.2.1 of the Verification Report for details.
For monitoring aspects that are not specified in the methodology, particularly in the case of small scale methodologies (e.g., additional monitoring parameters, monitoring frequency and calibration frequency), the DOE should bring to the attention of the Board issues which may contribute in enhancing the level of accuracy and completeness of the monitoring plan.	☒	Not Applicable.
(2) Assess monitoring results to verify:		
The monitoring plan is properly implemented and followed by the project participants	☒	Confirmed by CRA during Site Visit. See Section 3.2.2 of the Verification Report for details.

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All parameters stated in the monitoring plan and relevant Board decisions have been sufficiently monitored and updated as applicable, including: • Project emission indicators • Baseline emission indicators • Leakage indicators • Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan	☒	Only Baseline Emissions in this project type. Management systems are reviewed in Section 3.4 of the Verification Report.
The accuracy of equipment used for monitoring is sufficient and regularly controlled and calibrated in accordance with the monitoring plan, the applied methodology, the Board guidance, local/national standards, or as per the manufacturer's specifications	☒	Accuracy of electrical meters was confirmed. See Section 3.3 of the Verification Report for details.
Monitoring results are consistently recorded as per approved frequency	☒	Confirmed by CRA during Site Visit.
Quality assurance and quality control procedures have been applied in accordance with the monitoring plan	☒	See Section 3 of the Verification Report.
(3) Bring to the attention of the VCSA issues which may contribute in enhancing the level of accuracy and completeness of the monitoring plan, for monitoring aspects that are not specified in the methodology, particularly in the case of small-scale methodologies	☒	None noted.
COMPLIANCE WITH CALIBRATION FREQUENCY REQUIREMENTS		
(1) Determine whether the calibration of those measuring equipments that have an impact on the claimed emission reductions is conducted by the project participants at a frequency specified in the applied monitoring methodology and/or the monitoring plan	☒	Nature of electrical meters is digital and is only required to be "meter tested". No actual calibrations performed. See Section 3.3 of the Verification Report for details.
(2) If it is identified that the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (i.e., the results of delayed calibration are available), the DOE may conclude its verification, provided the following conservative approach is adopted in the calculation of emission reductions: (a) Applying the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration, if the results of the delayed calibration do not show any errors in the measuring equipment, or if the error is smaller than the maximum permissible error, or (b) Applying the error identified in the delayed calibration test, if the error is beyond the maximum permissible error of the measuring equipment	☒	Calibration was not identified to be delayed.

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(3) Confirm that the error has been applied		
In a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed emission reductions	☒	Meter Test Report shows that meter is reading within the tolerable error of 2 percent.
For all measured values taken during the period between the scheduled date of calibration and the actual date of calibration	☒	Not Applicable.
(4) In cases where the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification, request, prior to finalizing verification, the project participants to conduct the required calibration and shall determine whether the project participants have calculated the emission reductions conservatively	☒	Not Applicable.
(5) In cases where it is determined that it is not possible for the project participants to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of project participants, follow the requirements for post registration changes	☒	Not Applicable.
(6) In cases where neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipments, determine whether the equipments are calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used	☒	Not Applicable.
ASSESSMENT OF DATA AND CALCULATIONS OF GHG DATA		
(1) Assess the data and calculations of GHG emission reductions achieved by/resulting from the project activity by the application of the selected approved methodology.	☒	Working paper re-calculation was completed by CRA. See Section 3.2.3 of the Verification Report for details.
(2) Determine during verification that:		
A complete set of data for the specified monitoring period is available. If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, opt to either raise a CAR for the project participants to comply with the requirements of appendix 1 of the Project standard or submit a request for deviation prior to submitting request for issuance, if applicable.	☒	Annual data of net electricity generated was supplied as per findings assessments.
Information provided in the monitoring report has been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis.	☒	Confirmed during Site Visit check of the SCADA system.
Calculations of baseline emissions and proposed project activity emissions and leakage, as appropriate, have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document.	☒	Working paper re-calculation was completed by CRA. See Section 3.2.3 of the Verification Report for details.
Any assumptions used in emission calculations have been justified	☒	No assumptions made.

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Appropriate emission factors, IPCC default values and other reference values have been correctly applied.	☒	Confirmed the appropriate use of the approved emission factor.
ACCURACY		
(1) Checking for accuracy involves:		
For quantitative data and information: minimizing bias and uncertainty in the measurement process and the processing of data.	☒	Only electricity meters used. Accuracy confirmed as per comment above.
For non-quantitative information: minimizing bias in favour of a particular result.	☒	Only quantitative data assessed.
(2) Ensure that the level of accuracy and completeness in the monitoring and verification process will not be reduced as a result of the proposed revision. Using objective evidence, assess the accuracy and completeness of each proposed revision to the monitoring plan including the frequency of measurements, the quality of monitoring equipment (e.g., calibration requirements, and the quality assurance and quality control procedures).	☒	Revision to the methodology provide clarity on how the quantity of net electricity generation supplied to the grid shall be monitored. The Project Proponents already complete the required monitoring using electricity meters. No update required.
POST-REGISTRATION CHANGES		
(1) Determine whether the changes do not require prior approval by the Board in accordance with appendix 1 of Project standard	☒	None noted.
(2) Determine whether the changes are solely of a type(s) listed in appendix 1 of the Project standard and: (a) In such cases, the DOE shall submit the changes as part of the request for issuance in accordance with the Project cycle procedure (b) In all other cases, the DOE shall submit the changes via the request for approval of post registration changes process of the Project cycle procedure	☒	Not Applicable.
(3) Where the changes are submitted to a DOE prior to the commencement of verification, the DOE shall submit the changes via the request for approval of post registration changes process of the Project Cycle Procedure	☒	Not Applicable.
(4) Determine whether there are deviations from the registered monitoring plan and/or methodology		
If it is identified that the project participants have deviated from the registered monitoring plan and/or methodology, and where the provisions of appendix 1 of the Project standard do not apply, the DOE shall seek prior approval from the Board with respect to the acceptability of the deviations in accordance with the Project cycle procedure	☒	Not Applicable.

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Determine whether the deviation is likely to lead to a reduction in the accuracy of the calculation of emission reductions. In cases where the DOE considers that the deviation will lead to a reduction in the accuracy of the calculation of emission reductions, the DOE shall request the project participants to apply conservative assumptions or discount factors to the calculations to the extent required to ensure that emission reductions will not be over-estimated as a result of the deviation	☒	Not Applicable.
For cases where a deviation from the monitoring plan may be applicable to the monitoring period under verification, and part of the subsequent monitoring period, verify the exact period to which the deviation applies.	☒	Not Applicable.
(5) Determine whether there are corrections to project information or parameters		
Verify that any corrections to project information or parameters fixed at validation, as described in the registered PDD, made by project participants in a revised PDD comply with the requirements of the Project standard	☒	Not Applicable.
If it is identified that the project participants have made corrections to project information or parameters determined at validation, determine whether: (a) The corrected information is an accurate reflection of actual project information; and/or (b) The corrected parameters are in accordance with the applied methodology and/or selected monitoring plan	☒	Not Applicable.
(6) If the project participants wish to change the start date of the crediting period in accordance with section 12.8 of the Project standard, the DOE shall determine whether the proposed changes result in a less conservative baseline	☒	Not Applicable.
Indicate if the requirements in the Project standard have been met and shall submit a request for post registration changes in accordance with the Project cycle procedure.	☒	Not Applicable.
(7) Verify whether there are permanent changes from the registered monitoring plan and/or methodology		
Determine whether the changes to the monitoring plan contained in the registered PDD proposed by the project participants are in compliance with the applied methodology and do not reduce the level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan	☒	Not Applicable.
In cases where the proposed changes refer to a later version of the applied methodology in the registered PDD, determine whether the application of any later version of the applied methodology and tools does not impact the conservativeness of the monitoring and verification process, including the related emission reduction calculations.	☒	Not Applicable.

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If it is identified that the project participants are unable to implement the monitoring plan contained in the registered PDD and it will not be possible to monitor the registered VCS project activity in accordance with a monitoring plan that would comply with the applied methodology and any applicable tools or the relevant provisions of appendix 1 of the Project standard, the DOE shall request guidance from the Board concerning the acceptability of the permanent changes in accordance with the section on post registration changes in the Project cycle procedure	☒	Not Applicable.
Determine whether the permanent changes are likely to lead to a reduction in the accuracy of the calculation of emission reductions. In cases where the DOE considers that the permanent changes will lead to a reduction in the accuracy of the calculation of emission reductions, the DOE shall request the project participants to apply conservative assumptions or discount factors to the calculations to the extent required to ensure that emission reductions will not be over-estimated as a result of the permanent change	☒	Not Applicable.
(8) Determine whether there are proposed or actual changes to the project design of a registered VCS project activity		
If it is identified that the project design in the implementation or operation of the project activity does not conform with the description contained in the registered PDD or the relevant provisions of appendix 1 of the Project standard, the DOE shall request guidance from the Board concerning the acceptability of the proposed or actual changes in accordance with the section on post registration changes in the Project cycle procedure	☒	Not Applicable.
In case of actual changes, the DOE shall, by means of an on-site visit and review of the submitted revised PDD by the project participants, which describes the nature and extent of the actual changes, determine whether this description accurately reflects the implementation, operation and monitoring of the modified project activity	☒	Not Applicable.
Conduct an on-site inspection to assess the impacts of the actual changes on the compliance of the monitoring plan, the applied monitoring methodology and tools and/or the level of accuracy of the monitoring activity.	☒	Not Applicable.
Determine, by means of reviewing the revised PDD against applicable additionality and methodological requirements, whether the proposed or actual changes would adversely affect the conclusions of the validation report of the registered PDD with regard to: (a) Additionality of the project activity (b) Scale of the project activity (c) Applicability and application of approved baseline methodology under which the project activity has been registered, or (d) The compliance of the monitoring plan with the applied monitoring methodology	☒	Not Applicable.

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If the proposed or actual changes affect the additionality of the project activity then confirm that: (a) In the case of investment analysis, project participants have only modified the key parameters in the original spreadsheet calculations affected by the proposed or actual changes to the project activity (b) In the case where only barriers have been claimed to demonstrate additionality, project participants have demonstrated that the barriers are still valid under the new circumstances	☒	Not Applicable.
In cases where the proposed or actual changes impact the implementation of the project activity and where the original methodology would no longer be applicable, and where the project participant applies a later version of the methodology or another methodology that is applicable to the project activity, the DOE shall confirm that the applied methodology and tools do not impact the conservativeness of the monitoring and verification process and the related emission reduction calculations	☒	Not Applicable.
Assess whether the revised PDD complies with the applied monitoring methodology and tools or any later version of the methodology or the requirements of another methodology that is applicable to the project activity	☒	Not Applicable.
VERIFICATION REPORT		
(1) The final verification report will include:		
A summary of the verification process and the scope of verification	☒	See Section 1.2 of the Verification Report.
Details of the verification team, technical experts, internal reviewers involved, together with their roles in the verification activity and details of who conducted the on-site visit	☒	See Section 2.2 of the Verification Report.
Findings of the desk review and site visit	☒	See Section 3 of the Verification Report.
Project Team's findings and conclusions as to whether: (a) The project activity has been implemented in accordance with the registered PDD or any approved revised PDD (b) The monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan, including compliance with any guidance provided by the Board regarding deviations from the provisions of a registered plan and/or methodology (c) The data and calculation of GHG emission reductions have been assessed to correctly support the emission reductions being claimed	☒	See Sections 3 and 4 of the Verification Report.
A list of each parameter specified by the monitoring plan and a statement on how the values in the monitoring report have been verified	☒	See Section 3.2.1 of the Verification Report.

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A statement that identifies any changes to the registered PDD, and their date of approval by the VCSA	☒	None made.
Assessment and close out of any CARs, CLs, or FARs issued to the project participants	☒	See Sections 3 and 4 of the Verification Report.
Assessment of remaining issues from the previous verification period, if appropriate	☒	See Section 3.1.2 of the Verification Report.
Conclusion on the verified amount of emission reductions achieved	☒	See Section 4 of the Verification Report.

ANNEX C: CURRICULA VITAE

EDUCATION

M.A.Sc. Mechanical Engineering, University of Waterloo, 1989
B.A.Sc. Mechanical Engineering, University of Waterloo, 1987

EMPLOYMENT HISTORY

1990- Present Principal/Vice-President
Conestoga-Rovers & Associates, Waterloo, ON
Named CRA Principal/Vice President, 2003
Named CRA Associate, 1998
1989-90 Instructor for Engineering Professionals, Beijing Languages Training Center, P.R. China

PROFESSIONAL REGISTRATIONS/AFFILIATIONS

Licensed Professional Engineer: Ontario, Michigan
Member, Air and Waste Management Association

PROFILE OF PROFESSIONAL ACTIVITIES

Railway and Transportation Sector Air Emissions Assessments

- Development of emissions factors applicable for the years 1990 to 2008 for Canada's railway industry, including all classes of railway operations. Work conducted for Transport Canada.
- Calculations of railway emissions for the 2009 Locomotive Emissions Monitoring Program report (LEM Report), including all freight and passenger and switching operations by all railway operations in Canada. Work conducted for Transport Canada.
- Calculations of railway emissions, and preparation of all figures and text for the 2010 LEM Report. Work conducted for the Railway Association of Canada.
- Invited to participate in the 2012 Railroad Workshop: Working Together to Reduce Locomotive Emissions in Urbana, Illinois. Major railroad operators in North America and key government agencies attended the workshop. Mr. Reusing is very familiar with the pros and cons of the various emissions reduction options for locomotives and railway operations.
- Study on the benefits of commuter rail operations by displacing highway traffic. Work was conducted for West Coast Express in BC.
- Greenhouse gas (GHG) verifications for Union Pacific railroad operations in the United States and Canadian Pacific railroad operations in North America.
- Modeling emissions and conducting air quality impact assessments associated with Environmental Assessments for two Detroit-Windsor and Buffalo-Fort-Erie bridge crossing projects. This included Mobile 6 emissions modeling and Caline, Caline3, Cal3QHC and AERMOD dispersion modeling.

Air Compliance, Permitting and Assessments

- Air compliance audits, Title V permitting, State permitting, Federally Enforceable State Operating Permits (FESOPs)/Synthetic Minor permitting, and evaluation and implementation of applicable NSPS, NESHAP, and MACT standards for manufacturing facilities including chemical, automotive, cellophane, coating, distillery, energy, fiberglass, food, glass, locomotive, metal finishing, molding, petroleum, secondary metals, steel and wood furniture manufacturing sectors in the United States, Canada, and the UK.
- Completed over 100 Ontario Emission Summary and Dispersion Modelling (ESDM) Reports for a variety of industries.
- Environmental Impact Statements (EIS) and Environmental Assessments (EA) for over 10 sites.
- Air emissions modeling, air dispersion modeling, permitting, risk assessments, noise assessments and ambient air monitoring programs for quarries, mines, aggregate processing equipment, cement manufacturing, landfills and site remediation facilities.
- Risk Management Plans (112R RMPs) including hazard assessments and off-site consequence analyses.
- USEPA Community Right to Know Application for a Continuous Release.
- USEPA Clean Air Act Emission Reduction Credit (ERC) Applications for emissions trading.
- Project Manager and primary technical resource for the General Motors Corporation EPCRA Corporate Manual and the General Motors of Canada Limited NPRI and OnAir Corporate Manual inclusive of the development of the associated training programs. Key components include detailed OEM process knowledge, VOC emission quantification methods and regulation compliance.
- Developed and manage numerous ambient air monitoring programs for particulate (PM, PM10, PM2.5), VOCs, TRS, and ozone.
- Expert for quantification of emissions reductions as part of CRA's role as an Applicant Entity (AE) for Clean Development Mechanism (CDM) projects in the United Nations Framework Convention on Climate Change and for Alberta Environment offset project emissions.
- Manage and conduct corporate training programs for US EPCRA and Canadian NPRI Reporting.
- Managed and conducted EPCRA, NPRI, and OnAir Reporting for over 50 facilities.
- Air emissions inventories, dispersion modeling and permitting for over 200 manufacturing facilities.
- Air emissions assessments, permitting, and monitoring for over 30 hazardous waste site remedial actions including groundwater treatment systems, soil remediation systems and fugitive emissions.
- Litigation support including expert testimony.
- Odor emissions assessments and preparation of remedial action plans for numerous facilities in the food, chemical and automotive sectors.
- Incinerator/oxidizer design, installation, permitting and trial burn stack testing including a RCRA hazardous waste incinerator.
- Air emissions assessments for over ten landfill sites including estimation of landfill gas generation rates and particulate and evaluation of off-site impacts of odor and VOCs and NSPS requirements.
- Managed and conducted stack testing programs for over 50 facilities.

Noise and Vibration Compliance, Permitting, and Assessments

- Noise impact assessments for wind farms including noise modeling and noise monitoring of various proposed and existing wind farm projects in Barrie, Ontario and New York State in accordance with applicable noise guidelines, bylaws, and regulations.
- Noise and vibration impact assessments and attenuation for equipment and traffic sources at over 50 manufacturing facilities, residential developments, and landfill sites.
- Noise impact assessments and abatement for a variety of clients involved in food processing including ice cream, cheese manufacturing, meat processing, and chemical preservatives.
- Conducted noise impact assessment for Oklahoma Highway 64 expansion using Federal Highway Administration Traffic Noise Model (TNM).
- Prepared residential noise barrier design for highway noise impacts using Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) model.
- Managed a railroad noise assessment for a proposed residential development using the Ontario Sound from Trains Environmental Analysis Method (STEAM) model.
- Managed noise monitoring programs and impact studies for two lime mining and manufacturing facilities including large kiln operations and traffic assessments.
- Prepared an Acoustic Audit report for a casting plant in accordance with permit requirements.
- Managed noise study for landfill site including road traffic and on-site equipment and barrier design.
- Managed acoustic audit for a dust collection system including sound frequency measurements for ductwork, fan, and collector.
- Acoustic audit and residential impact evaluation for an oxidizer used in automotive industry.

Incineration, Gasification, and Thermal Treatment Facilities

- Mr. Reusing has extensive air emissions and noise emissions experience with incineration, gasification and thermal treatment facilities, including incineration of municipal and hazardous wastes, and gasification of biomass, biosolids, and municipal waste. His experience includes both waste disposal and energy from waste facilities. Mr. Reusing has completed numerous emissions inventories, Applications for Certificates of Approval (Air), noise assessments, trial burns, environmental assessments, stack testing, ambient air monitoring, and engineering emission control studies for many types of incineration and gasification facilities including:
 - Clean Harbors (liquid hazardous waste incineration), Corunna, Ontario
 - Durez Corporation (liquid hazardous waste incineration), Niagara Falls, New York
 - Algonquin Power (municipal waste incineration to power), Brampton, Ontario
 - REM Energy (municipal waste gasification to power), multiple sites, Canada and US
 - Pristine Superfund Site, (PCB waste thermal desorption site), Reading, Ohio
 - Clean Harbors (solid waste thermal desorption), Corunna, Ontario
 - Liberty Energy (biomass and biosolids gasification to power), Hamilton, Ontario
 - Elementa Group (municipal waste steam reformation to energy), Sault Ste. Marie, Ontario
 - Index Energy (biomass incineration to power), Ajax, Ontario
 - Carter Industrials Superfund Site, (PCB waste thermal desorption site), Detroit, Michigan

Iron and Steel and Foundry Facilities

- Mr. Reusing has managed emissions inventories, Applications for Certificates of Approval (Air), stack testing, ambient air monitoring, and engineering emission control studies for many iron and steel and foundry facilities including:
 - Algoma Essar, Primary Steel Mill, Sault Ste. Marie, Ontario
 - Stelco Steel, Primary Steel Mill, Hamilton, Ontario
 - Dofasco Steel, Primary Steel Mill, Hamilton, Ontario
 - Gerdeau-Ameristeel, Secondary Steel Mill, Whitby, Ontario
 - Atlas Specialty Steel, Secondary Steel Mill, Welland, Ontario
 - Standard Induction Casting, Steel Foundry, Windsor, Ontario
 - Diversa Cast, Steel Foundry, Guelph, Ontario
 - Slater Steel, Secondary Steel Mill, Hamilton, Ontario
 - Daimler Chrysler, Aluminum Castings Plant, Etobicoke, Ontario
 - Cambridge Brass, Brass Foundry, Cambridge, Ontario
 - Oxford Automotive, Chatham and Wallaceburg, Ontario
 - Canada Alloy Castings (a Division of Flowserve), Steel Foundry, Kitchener, Ontario
 - Delta Faucet, Brass Foundry, London, Ontario
 - Milward Alloys, Secondary Brass Foundry, Buffalo, New York
 - H. Kramer, Secondary Brass Foundry, Chicago, Illinois
 - Heico Steel, Secondary Steel Mill, Hawkesbury, Ontario

Renewable Energy Projects

- Mr. Reusing is a renewable energy technology and air emissions expert with a keen interest in renewable energy and considerable experience in the project management of renewable energy projects. Mr. Reusing has completed solar, wind, biomass, and biosolids power feasibility and environmental impact assessments for sites across North America. Mr. Reusing has considerable experience working with Municipalities and has managed public information sessions and consultations on a variety of renewable energy projects.
- Mr. Reusing has managed the compliance permitting and environmental assessment programs for several renewable energy facilities. These include: solar and alternative energy feasibility study for Township of Michipicoten, Ontario; a wind energy feasibility study for City of Barrie; a wind energy feasibility and energy audit study for Huron County in Ontario; 1,000 MW of wind projects in the state of New York, the Liberty Energy 10 MW biomass and biosolids gasification facility in Hamilton, Ontario; the Elementa Group 10 MW municipal waste steam reformation plant and associated pilot plant in Sault Ste. Marie, Ontario; the Index Energy Ajax Cogeneration 25 MW wood waste to steam and power plant in Ajax, Ontario; Mr. Reusing has also verified the greenhouse gas (GHG) credits for the Verdant 10 MW wood waste power plant and the Blue Ridge and Sundance wood biomass thermal energy plants in Alberta.

Environmental Impact Statement (US-EIS) and Environmental Assessment (Canadian-EA) Projects

- Mr. Reusing has managed the air emissions and noise assessments for numerous environmental impact statement (EIS) and environmental assessment (EA) projects in the United States and Canada. This work includes advanced emissions and dispersion modeling, ambient air monitoring, noise

monitoring programs, advanced acoustic modeling and presentations for agency and public meetings for the following EIS, EA and high-profile air assessment projects:

- Liberty Energy Biomass Power Plant, Hamilton, Ontario
- Green Lane Landfill (City of Toronto), St. Thomas, Ontario
- Fort-Erie to Buffalo International Bridge Crossing, Ambassador Niagara Signature Bridge Group
- Sydney Tar Ponds Site, Sydney, Nova Scotia
- Wind Farms, 4 sites, each 400 to 1,000 MW capacity, Upstate New York
- Nuclear Waste Processing Facility, Mississauga, Ontario
- PCB Waste Processing Facility, Cornwall, Ontario
- Touquoy Gold Project, Moose River Gold Mines, Halifax Regional Municipality
- Clean Harbors (hazardous waste landfill expansion), Corunna, Ontario

Chemtura Canada Co./Cie. (formerly Crompton Co.), Elmira, Ontario

- CRA has provided air and noise consulting services and ambient air monitoring programs for Chemtura Canada Co./Cie. since 1990. The Chemtura (formerly known as Crompton) site in Elmira, Ontario required ambient air quality monitoring to be completed during excavation and transfer activities associated with the soil removal and transfer to a secure containment facility. CRA was retained to develop and implement a perimeter air quality monitoring program at the site.
- Chemtura also required an extensive VOC and reduced sulphur monitoring program as part of an odour emissions investigation over a period of 3 years. CRA implemented a complex program consisting of portable GCs and continuous reduced sulphur monitors for instantaneous, compound specific monitoring. In addition, CRA conducted time-averaged VOC and sulphur compound monitoring using USEPA and NIOSH methods. CRA also designed, installed, operated and maintained a meteorological station on site for 3 years. CRA continues to provide significant air quality services to Chemtura which includes ambient air quality monitoring for selected VOCs, source testing, annual emissions reporting including Reg. 127 and NPRI, C of A (Air) preparation, site specific risk assessments and other applicable regulatory assistance.

MRR PCB Incineration Facility, Cornwall, Ontario

- The Material Resource Recovery (MRR) PCB incineration facility retained CRA to conduct an ambient air monitoring program for particulate, PCBs and dioxins and furans in 2005. CRA also conducted a phytotoxicology sampling program and a 5-year technical review of the PCB incinerator operation. Two public presentations of the 5-year review and the air sampling and phytotoxicology sampling programs were conducted and lead by Mr. Gordon Reusing, the Project Manager for this Proposal. CRA is currently preparing an Application for C of A (Waste) and (Air) for major modifications, including emissions estimates and dispersion modeling.

Landfills – Air and Noise Assessments, Regulatory Reporting

- Mr. Reusing has extensive air and noise assessment experience and regulatory reporting experience, completing over 80 reports each year for a wide variety of industrial and municipal clients, including over 15 landfill and waste management sites, including:
 - Merrick Landfill Site and City Public Works Garage, City of North Bay, Ontario
 - Mayer Waste Disposal Site, Township of Champlain, Ontario
 - Marathon Landfill Site, Town of Marathon, Ontario

- Green Lane Landfill Site, St. Thomas, Ontario
- Millstream Landfill, Victoria, British Columbia
- Municipality of McDougall Landfill Site, Township of McDougall, Ontario
- City of Kawartha Lakes 6 Landfill Sites and Water Pollution Control Plant, Lindsay, Ontario
- Dawn and Moore Landfill Sites, County of Lambton, Ontario
- St. Mary's Landfill Site, St. Mary's, Ontario
- Mid-Huron Landfill Site, Clinton, Ontario
- Peterborough County/City Waste Management Facility, Peterborough, Ontario
- Brighton and Seymore Landfill Sites, County of Northumberland, Ontario
- Highwest Landfill, Victoria, British Columbia

Quarries and Mining – Air and Noise Assessments, Regulatory Reporting

- Mr. Reusing has completed numerous air and noise assessments, ambient air monitoring and regulatory reporting projects for quarry and mining sites, including:
 - Dufferin Milton Quarry, Dufferin Aggregates a Division of St. Lawrence Cement, Milton, Ontario
 - Air and noise permitting for 3 to 6 million tonnes per year limestone quarry
 - Vinemount Quarry, Division of Waterford Sand and Gravel, Hamilton, Ontario
 - Ontario Municipal Board hearings for quarry expansion, ambient air monitoring programs and air quality assessments for 1.5 million tonnes per year limestone quarry
 - McDougall Quarry, Fowler Construction Company Limited, Parry Sound, Ontario
 - Air and noise permitting for limestone quarry processing equipment
 - Lafarge Cement Quarries (2), Bath and Woodstock Cement Plants, Ontario
 - Air and noise permitting and blasting assessment for limestone quarry operations
 - Federal White Cement Plant Quarries (2), Woodstock Plant, Ontario
 - Air and noise permitting for limestone quarry operations and air quality assessments
 - Rockfort Quarry, James Dick Construction Ltd, Caledon, Ontario
 - Air quality assessments and dispersion modeling for proposed 1.5 to 2.5 million tonnes per year limestone quarry
 - St. Vincent Quarry, Grey County, Ontario
 - Noise and blasting assessment
 - Durham Aggregate Pit, Grey County, Ontario
 - Acoustic Assessment Report
 - Vermiculite Canada Mine, Regis Resources, Buckhorn, Ontario
 - Air and noise permitting for vermiculite open surface mine
 - Touquoy Gold Mine Project, Moose River Gold Mines, Halifax Regional Municipality, Nova Scotia
 - Air, noise, and light environmental assessment studies

PUBLICATIONS AND PRESENTATIONS

- Reusing, G.L., et al, "Locomotive Emissions Monitoring Program 2010 Report", Railway Association of Canada (conducted the emissions calculations for all railway operations in Canada for 2010 and prepared draft text, tables and figures).
- Reusing, G.L., et al, "Locomotive Emissions Monitoring Program 2009 Report", Railway Association of Canada (conducted the emissions calculations for all railway operations in Canada for 2009).
- Reusing, G.L., Wiens, T., Grozev, G., Zher, Z., "Quantifying the Ambient Environment:: Siting Within the Urban Din", Inter-Noise 2012 Conference, New York, NY, August 19-22, 2012.
- Reusing, G.L., "Greenhouse Gas Verification Methodology", Lecture given to University of Waterloo School of Environment, Enterprise and Development, June 21, 2012.
- Reusing, G.L., "Environmental Regulation and Compliance 2012", presentations given at the CANECT '12 Conference, International Conference Center, Mississauga, April 30, 2012.
- Reusing, G.L., R. Maier, "Tire Recycling Pilot Plant Using Microwave Technology", Air and Waste Management Association, Ontario Section Annual Conference, Toronto, October 6, 2010.
- Reusing, G.L., Tim Wiens, "Noise Modelling Versus Reality Under Worst-Case Meteorological Conditions", Canadian Acoustics Proceedings, Volume 38, Number 3, September 2010.
- Reusing, G.L., "Liberty Energy Study", Latest Developments in Air Modeling Conference, Air and Waste Management Association, Toronto, January 19-22, 2009.
- Reusing, G.L., "District Energy Plants and Ajax Case Study", Sustainable Energy Career Symposium, University of Waterloo, January 26, 2009.
- Reusing, G.L., Nolan, W., Kerr, G., Taylor, C., "Biomass to Energy: Greenhouse Gas Reduction Quantification Protocols and Case Study" 2nd Climate Change Technology Conference, Hamilton, May 12-15, 2009.
- Reusing, G.L., Taylor, C., Vel, S. "Greenhouse Gas Reduction Quantification Protocols for Biomass Projects", Annual Air and Waste Management Conference, Detroit, June 16-19, 2009.
- Reusing, G.L., Annual Environmental Compliance Training Seminars for General Motors, Masco Corporation, Tomkins Corporation, Magna International, Linamar Corporation and various industry associations 2003-2007.
- Reusing, G.L., Session Moderator, Environmental Nuisances: Noise, Light, Odor and Fugitive Dust, Air and Waste Management Conference, Vancouver, May 2007.
- Reusing, G.L., "New Ontario Dispersion Models and Air Standards, Odor Assessments and Noise Assessments", Environmental Law & Regulation Conferences, Canadian Institute, 2005 and 2006.
- Reusing, G.L., "Introduction to Environmental Issues for Occupational Health and Safety", Environmental Panel Discussion Expert, University of Western Ontario Course, November 2006.
- Reusing, G.L., "Fugitive Dust Assessment and Control", Environmental Nuisances: Noise, Odor and Fugitive Dust, Air and Waste Management Conference, Toronto, May 9-11, 2005.
- Reusing, G.L., "New Ontario Dispersion Models and Air Standards, Odor Assessments and Noise Assessments", Environmental Law & Regulation Conference, Canadian Institute, December 2, 2005.
- Reusing, G.L., "Preparing Applications for Certificates of Approval (Air)", Centre for Health-Environment-Safety (CHES), Training Seminar for Industry, March 10, 2005.
- Reusing, G.L., "Expediting Certificates of Approval Air", Environmental Law & Regulation Conference, Canadian Institute, December 8, 2004.

- Reusing, G.L., Freeman, D., "Air Dispersion Modeling", Training for New Brunswick Department of Environment and Local Government Air and Risk Assessment Staff, Fredericton, New Brunswick, November 2002.
- Reusing, G.L., Law, S., Loney, A., "Ambient Air Odor Regulations in Canada and the United States", Paper Presented to the 2002 Joint CSCE/EWRI of ASCE Environmental Engineering Conference, An International Perspective on Environmental Engineering, Niagara Falls, Ontario, July 2002.
- Reusing, G.L., "Odor Assessment Methodology for a Complex Industrial Facility", Paper Presented to the Odors and Toxic Air Emissions 2002 Specialty Conference, Water Environment Federation, Albuquerque, New Mexico, April 2002.
- Reusing, G.L., "Industrial Wood-Fired Boiler Optimization and Emissions Compliance", in Pollution Engineering, April 2002.
- Reusing, G.L., "Ontario Environmental Compliance Seminar - Air Regulations", Canadian Association of Metal Finishers, September 2001.
- Reusing, G.L., "Understanding the Clean Air Act", Paper Presented to the Environmental Regulation Course, Executive Enterprises, Cincinnati, October 1995.
- Reusing, G.L., Crutcher, A.J., Benson, M.A., "Waste Management Issues for the Forest Industry - Burning of Woodwaste", Paper Presented to the 1994 Environmental Law and Management Conference for the Canadian Forest Industry, Toronto, September 1994.
- Reusing, G.L., Bragg, G.M., "A Multi-Chamber Ventilation Model with Random Parameters", in Building and Environment, Volume 25, No. 4, 1990.
- Siurna, L., Bragg, G.M., Reusing, G.L., "Transient Solutions to a Stochastic Ventilation Model", in Building and Environment, Volume 24, No. 3, 1989.

EDUCATION

B.Eng. Environmental Engineering (Co-op), University of Guelph, 2008

EMPLOYMENT HISTORY

2008-Present Conestoga-Rovers & Associates, Waterloo, ON
2007 Student Engineering Assistant, Conestoga-Rovers & Associates (8 months)
2006 Student Engineering Assistant, Conestoga-Rovers & Associates (8 months)
2005 Student Biomonitoring Technician, Ontario Ministry of the Environment (4 months)

PROFESSIONAL REGISTRATIONS/AFFILIATIONS

Registered Professional Engineer: Ontario

PROFILE OF PROFESSIONAL ACTIVITIES

Greenhouse Gas Validation/Verification Projects

- Listed as a Key Team Member and Project Manager in the Greenhouse Gas Assurances (GGAS) Group and assisted in the successfully obtaining CRA's Designated Operating Entity (DOE) status with the UNFCCC effective as of May 28, 2010, the Verified Carbon Standard as of August 3, 2010, and the American National Standards Institute (ANSI) as of November 14, 2011.
- Performed roles of Lead Auditor and/or Auditing Team Member for the following CDM Projects:
 - CO₂ Removal and Liquefaction from the H₂ Production Plant in Campana, Argentina - Validation (Sectoral Scope 5)
 - Bionersis LFG Project Chile 4 (Los Angeles, Chile) - Validation (Sectoral Scope 13)
 - Bionersis LFG Project Argentina 2 (Tucumán, Argentina) - Validation (Sectoral Scope 13)
 - Bionersis LFG Project Colombia 2 Verification Bucaramanga, Colombia 13
 - Bionersis LFG Project in Pasto, Colombia - Verification (Sectoral Scope 13)
 - Bionersis LFG Project in Duquesa, Dominican Republic - Verification (Sectoral Scope 13)
 - Malaysia Biogas Projects Programme of Activities (PoA) - Validation of Multiple Sites (Sectoral Scopes 1 and 13)
 - Bionersis Landfill Gas Flare & Energy Program in Chile (PoA and CPA) - Validation (Sectoral Scope 13)
 - Bionersis Landfill Gas Flare & Energy Program in Argentina (PoA and CPA) - Validation (Sectoral Scope 13)
 - San Jacinto Geothermal Power Project in Nicaragua - Validation (Sectoral Scope 1)
 - Recovery and Utilization of Gas Normally Flared in Petroleum Production Fields in Colombia (PoA and CPA) - Validation (Sectoral Scope 1)
 - Biomass Based Thermal Energy Projects Malaysia (PoA and CPA) - Validation (Sectoral Scope 1)
 - PoA for Electricity Generation using Natural Gas in Colombia - Validation (Sectoral Scope 1)

- Performed roles of Lead Auditor and/or Auditing Team Member for the following VCS Projects:
 - Dempsey Ridge Wind Farm Project in Oklahoma - Validation/Verification (Sectoral Scope 1)
 - MRO Grouped Wind Projects in Iowa - Validation (Sectoral Scope 1)
 - Red Hills 123 MW Wind Power Project in Oklahoma - Verification (Sectoral Scope 1)
- Lead Auditor for the VCS Methodology Assessment of changes from the CDM Methodology entitled "Methane Avoidance through Separation of Solids from Wastewater or Manure Treatment Systems" (AMS.III-Y).
- Lead Auditor for several other GHG Assurance projects under the DOE Accreditation including the Verification of the Recycling of Refrigerators, Freezers, and Metal-Containing Foam Insulation Panels in the South- East of Brazil (Sectoral Scope 13) under the Swiss Charter and the Validation of the 50 MW Dinar Wind Power Project in Turkey (Sectoral Scope 1) under The Gold Standard
- Performed Lead Auditor and Peer Review Roles for nine projects within Ontario for the 2011 reporting period. This work was completed under CRA's ANSI Accreditation.
- Conducted greenhouse gas verification assessments as a Lead Auditor in Training for three projects for Alberta Environment; a liquid natural gas plant in Boyle, Alberta (2011), a pulp mill (2011) in Fort Saskatchewan, Alberta, and a static-pile aerobic composting site (2009) in Edmonton, Alberta under the Alberta Offset System which included a site visit, review of the overall processes, record keeping practices and techniques, emission reduction calculations compliance, and a report on findings.
- Experience with the validation process in preparation of Project Design Documents (PDD) and Monitoring Plans for emission reduction projects related to landfill gas destruction under the Clean Development Mechanism (CDM) for the Manaus landfill (Manaus, Brazil).
- Performed greenhouse gas emission reductions calculations and prepared the Monitoring Report for the Aurà and CEAMSE landfill sites in Brazil and Argentina respectively. The reports were completed to UNFCCC standards and included a review of the overall process, record keeping practices and techniques and emission reduction calculation compliance.
- Performed greenhouse gas emission reduction calculations using a modified first order kinetic landfill gas model for a municipal solid waste anaerobic digester under CDM requirements for various sites across the Canada and the USA as well as in Egypt. All of these sites also included an assessment of emission reductions associated with cogeneration.
- Completed assessment for emission reduction credits for a large-scale operation green-packaging project using sugar cane bagasse in Brazil under CDM biomass methodology AM0057 requirements. The project additionally generates electricity using the bagasse material.
- Prepared detailed assessment of transferability of Alberta Offset System protocols to CDM protocols in relation to both cement and asphalt methodologies for Shell.
- Conducted a greenhouse gas verification report for the Eastview Landfill Site in Guelph, Ontario. The report was compiled in accordance with the requirements of the PERRL Initiative.
- Developed a Project Information Note (PIN) for the emissions avoided through aerobic composting at the Orgaworld London and Ottawa, Ontario composting facilities as well as the City of Guelph Wet/Dry composting facility. Preparation of this document includes the quantification of emission reduction using the Alberta Offset System Protocols.
- Developed several project documents under various emissions reporting standards for landfill operations in British Columbia including the Nanaimo Landfill and the Salmon Arm Landfill Sites and in Ontario at the Eastview Landfill Site. These reports have been prepared in accordance with ISO-14064 Part 2 standards using various GHG methodologies to quantify the emissions such as those from the UNFCCC and CAR.

Design and Operations

- Performed tender administration, contract administration and construction oversight roles for the design and installation of a landfill gas collection and control system at the Stratford Landfill Site.
- Developed a detailed design and design and operations report for the landfill gas collection and control system for the Humberstone Landfill, Welland, Ontario, and the Stratford Landfill, Stratford, Ontario including the well field design, specification drawings including all relevant hydraulics, buried pipe and condensate trap sizing calculations.
- Provided operational assistance for the Eastview Landfill including balancing of the well field, assessments of the leachate collection system and the operations of the utilization facility.
- Provides operational support for organics processing facilities in London and Ottawa, Ontario including odour assessments involving the odour abatement equipment efficiencies and operations improvements to minimize fugitive odours.
- Developed the model package (Design and Operations Report) for the Application for Amendment to Provisional Certificate of Approval for a Waste Disposal Site, for landfill sites which apply under amended Ontario Regulations 232/98 and 347 for the Ontario Ministry of the Environment.
- Assisted in preparation of a study regarding applicable wastewater treatment technologies and disposal options for an organics processing facility in Ontario.
- Assisted with the submission of applications for Amendments Certificate of Approval for Air, Waste Disposal Site and Section 53 (Industrial Sewage Works) under the Environmental Protection Act (including formulation of a Design and Operations Report for the site) for source-separated organics aerobic composting facilities in London, Ontario and Ottawa, Ontario.

Computer Aided Design

- Performs day-to-day Auto-CAD drawings including process flow diagrams, general and civil scale drawings related to a variety of composting and landfill projects.

Solid Waste Management:

- Prepared cost estimates for the installation of landfill gas collection and control systems using both flaring and utilization technologies for international and Canadian landfills: Manaus landfill (Manaus, Brazil), and the Eastview landfill (Guelph, Ontario).
- Assisted with the preparation of successful proposals for a 5-year contract to haul and process source-separated organics for the City of Toronto and a 20-year contract to process source-separated organics for the City of Ottawa.
- Assisted in the completion of a 2007 Baseline Study of Canadian Landfills based on waste filing practices and leachate management considering nearly 90 landfill sites for Environment Canada.

Modelling and Assessment:

- Experience with Scholl-Canyon and Rettenberger first-order landfill gas generation models for the prediction of landfill gas generation at several landfills in Canada, the United States of America (U.S.A.) and South America.
- Experience with Scholl-Canyon and Rettenberger first-order landfill gas generation models as they apply to anaerobic municipal solid waste digesters for projects in the U.S.A.

- Performed landfill gas modelling and assessment for international landfills: González Catàn landfill and Ensenada landfill (Buenos Aires, Argentina), Aurà landfill (Belém, Brazil), Manaus landfill (Manaus, Brazil).
- Performed greenhouse gas emission reductions calculations and reporting for the Eastview landfill (Guelph, Ontario) and assisted with emission reductions calculations for the Merrick landfill (North Bay, Ontario) under the Pilot Emission Reductions, Removals, and Learnings (PERRL) initiative.

Agricultural Engineering

- Developed and assisted in implementing a monitoring methodology under the Climate Action Reserve (CAR) for the collection and utilization of methane gas produced in anaerobic dairy manure digesters for various projects in California, U.S.A.
- Assisted in approvals process for Provincial certificates of approval for the utilization of leachate and ammonium sulphate as a non-agricultural source material (NASM) on agricultural lands for a composting facility's in both London and Ottawa, Ontario.

Presentations

- Prepared and delivered a presentation entitled "Understanding the Clean Development Mechanism (CDM) Project Development Process" to the CRA community through a recorded webinar conference. The presentation covered all aspect of project validation and verification from the perspective of a project developer as well as an independent party conducting validations or verifications of project activities.
- Prepared a presentation on the current and future odour management at a composting facility operation within Ontario. The presentation was presented to local stakeholders, members of the MOE and the local Municipality.

EDUCATION

B.Sc. Eng. Environmental Engineering, University of Guelph, 1996

Other Training

Testing Industrial Air Emissions, 2000

Chemical Hydrogeology, University of Waterloo, 2002

Environmental Microbiology, 2002

Industrial Processes, 2004

Environmental Economics, 2006

Industrial Ecology, 2007

ISO 14064 Part 1 – Greenhouse Gas Inventories, 2008

ISO 14064 Part 2 – Greenhouse Gas Projects, 2008

ISO 14064 Part 3 – Greenhouse Gas Verification, 2010

EMPLOYMENT HISTORY

1998-	Principal/Vice-President
Present	Conestoga-Rovers & Associates, Waterloo, Ontario
	Named CRA Principal/Vice-President, 2013
	Named CRA Associate, 2006
1998	Research Assistant, Agriculture and Agri-Food Canada
1996-97	Environmental and Quality Assurance Technician, Golden Town Apple Products

PROFESSIONAL REGISTRATIONS/AFFILIATIONS

Registered Professional Engineer: Ontario

Michigan Board of Professional Engineers Fundamentals of Engineering Exam, April 1999

PROFILE OF PROFESSIONAL ACTIVITIES

Greenhouse Gas Emissions Reporting, and Validation, and Verification and Life Cycle Assessment

- Manager of CRA's Greenhouse Gas Assurance Services group responsible for coordinating and managing all greenhouse gas validation and verification projects under programs administered by the United Nations Framework Convention on Climate Change Clean Development Mechanism, The Gold Standard, Verified Carbon Standard, The Climate Registry, Carbon Disclosure Project, and the governments of Alberta, British Columbia, Massachusetts, Ontario, and Quebec.
- Project Manager and technical advisor for the preparation and verification of applications for funding to Sustainable Development Technology Canada for various clients, including the preparation of life cycle assessments.

- Project Manager for the preparation of a web-based, database-driven Environmental Footprint Calculator for a large cement, aggregate, and construction company in Canada.
- Lead verifier, verification team member, and independent peer reviewer for over 50 validation and verification audits of greenhouse gas inventories and projects in Alberta, Argentina, British Columbia, Colombia, Malaysia, Massachusetts, and Ontario and under several voluntary carbon markets.
- Project Manager for review and assessment of greenhouse gas emissions from the upstream oil and gas industry for Environment Canada.
- Peer Reviewer for the preparation of a Greenhouse Gas Inventory for a large North American potato chip producer, a large North American waste company, and several other clients.
- Senior Technical Advisor for the assessment of reporting requirements under the USEPA Mandatory Greenhouse Gas Reporting Rule for clients in the petroleum industry.

Air Emissions Sampling, Permitting, and Reporting

- Project Manager for numerous air emissions assessments for clients in Canada reporting under the National Pollutant Release Inventory (NPRI) and the Greenhouse Gas Reporting Program.
- Project Manager, Project Coordinator, and project engineer on numerous air permit applications and air emissions reports for numerous clients throughout Ontario.
- Project Coordinator for the Ontario Ambient Air Monitoring Sites for Environment Canada's Canadian National Air Toxics Measurement Program in 2004/2005. Responsible for coordination of all aspects of the sampling and reporting activities for over 10 ambient air monitoring sites in Ontario.
- Conducted sampling and reporting for numerous air emission source testing projects in Canada, the United States, and Puerto Rico, including specialized field gas chromatography sampling.
- Lead technical advisor for ambient air monitoring programs at multiple sites in Ontario and New Brunswick.
- Project Manager and Coordinator for air emissions activities associated with multiple facilities for an automotive parts manufacturer in Ontario, including preparation of Ontario Ministry of the Environment Director's Order appeal documents, Certificate of Approval (Air) Applications, Ontario Regulation 127 and National Pollutant Release Inventory reporting, and source sampling.

Agriculture-Related Experience

- Primary researcher for preparation of a paper regarding the evaluation of swine manure treatment processes for Agriculture and Agri-Food Canada.
- Researcher for the evaluation of a prototype cattle manure treatment technology for Agriculture and Agri-Food Canada.
- Project Manager for assessment of environmental issues associated with an aerobic composting operation.
- Technical Advisor for project to revise a greenhouse gas project protocol related to cattle manure emission reductions under the Verified Carbon Standard.

Environmental Due Diligence and Remediation

- Project Manager for ongoing Remedial Investigation/Feasibility Study (RI/FS) activities at a Superfund Landfill Site in Ohio.
- Project Manager for RCRA corrective action and Ohio Voluntary Action Program activities at a former refractory manufacturing facility in Ohio.

- Conduct investigative and remedial activities for a chemical manufacturing facility in Ontario including:
 - Project management, technical and field support relating to the remediation of contaminated off-site Municipal Aquifer
 - Project Manager for the design and construction of a \$4.2 million dollar ammonia treatment system for contaminated groundwater
 - Project Coordinator for annual ambient air monitoring program downwind of the site
 - Supervise and conduct field activities such as groundwater sampling, groundwater elevation monitoring, surface water sampling, surficial soil sampling, and waste water sampling air and odour sampling
- Project Manager for a large indoor contaminated soil excavation and groundwater collection trench installation at a former wallpaper manufacturing facility in Ontario.
- Project Manager and Project Coordinator for a large site assessment, plant demolition, and contaminated soil and groundwater remediation project at a former airplane manufacturing facility in Ontario.
- Project Manager and Phase I auditor for a large multi-site due diligence project at pulp and paper, mining, and port facilities in the Province of Newfoundland and Labrador.
- Project Manager and Project Coordinator for several litigation support projects in the United States, including preparation of expert reports, expert witness support, and completion of potentially responsible party searches.
- Project Manager and Assessor for numerous Phase I and II Environmental Site Assessments and Environmental Compliance Audits in the United States and Canada.
- Project Manager for activities at a large chemical manufacturer in Ontario, including wastewater treatment system optimization, compliance audit, Certificate of Approval (Air) Application preparation, asbestos survey, and ongoing compliance assistance.
- Project Manager for an AS/SVE and bioremediation project at an industrial site in New Jersey.
- Project Manager/Coordinator for facility-wide environmental and health and safety compliance audits and environmental monitoring programs for two large automotive manufacturing sites in Ontario.
- Project engineer for an Engineering Evaluation and Cost Assessment (EE/CA) for the remediation of a lead-acid battery disposal area in Michigan.

EDUCATION

B.Sc. Eng. Engineering Chemistry, Queen's University, 2004

Other Training

WHMIS/Hazard Communication Training, 2005

Transportation of Dangerous Goods Training, 2008

Environmental Site Assessment and Remediation, EPIC Learning Centre, 2006

EMPLOYMENT HISTORY

2007-Present Conestoga-Rovers & Associates, Waterloo, ON

2004-06 Environmental Analytical Chemist, Conestoga-Rovers & Associates, Waterloo, ON

2003-04 Student Research Assistant, Analytical Services Unit, Queen's University, Kingston, ON

PROFESSIONAL REGISTRATIONS/AFFILIATIONS

Registered Professional Engineer: Ontario

PROFILE OF PROFESSIONAL ACTIVITIES

United Nations Framework Convention on Climate Change Clean Development Mechanism Validation Projects

- Performed role as Validation Team Member on the following CDM Projects:
 - Biomass Based Thermal Energy Project Malaysia (PoA and CPA) – Sectoral Scope 1
 - Electricity Generation with Methane Gas normally flared in petroleum production fields, Colombia (PoA and CPA) in Colombia – Sectoral Scope 1

Environmental Site Assessment and Due Diligence

- Conduct investigative and remedial activities for a chemical manufacturing facility in Ontario including:
 - Project Engineer for Annual Monitoring Reports
 - Primary author of monthly Progress Reports, consisting of assessment and management of analytical data
 - Field support relating to the remediation of contaminated off-Site Municipal Aquifer
 - Develop and maintain site monitoring specifications
- Project coordinator for ongoing Remedial Investigation/Feasibility Study (RI/FS) activities at a Superfund Landfill Site in Ohio.
- Project coordinator and on-site environmental supervisor for Phase II Environmental Site Assessments at sites throughout Canada and USA. Responsibilities include coordination and

scheduling of field activities, contractor procurement, drilling oversight, and collection of soil and groundwater samples.

- Field support for a large multi-site due diligence project at pulp and paper, and mining facilities in the Province of Newfoundland and Labrador.
- Preparation of proposals and reports for activities including Phase I and II Environmental Site Assessments (ESAs), Decision Support Packages, due diligence investigations, soil and groundwater investigations, and site closures. Proposal preparation includes review of previous site history, work plan development, and costing preparation.
- Participation in groundwater remediation activities including well development, water level monitoring, and sampling events at industrial and agricultural facilities in Ontario and Texas.
- Prepared and submitted National Pollution Release Inventory (NPRI) Reports to the Ontario Ministry of the Environment and Environment Canada, on behalf of multiple companies.
- Responsible for proper classification of various types of waste materials in accordance with appropriate RCRA, and state environmental regulatory compliance requirements in order to prepare waste characterization profiles, and waste shipping manifests required to ensure proper disposal of waste at a permitted treatment, storage, and disposal facility.
- Project coordinator for environmental assessment projects for an oil company in Texas.

Project Chemist/Quality Control Officer

- Project coordinator for analytical aspects of projects including the preparation of laboratory contracts, review of laboratory results for completeness, and invoicing.
- Responsible for providing chemical advice to CRA field staff, for both Canadian and American projects, to ensure that appropriate sampling and QA/QC procedures are followed.
- Responsible for monitoring analytical data generated by subcontract laboratories, and ensuring that all aspects of sample processing are conducted in accordance with CRA's rigorous QA/QC program.
- Responsible for coordination and management of analytical requests and subcontract laboratories including cost control and invoice administration.
- Review and validation of analytical results for jobs in accordance with United States Environmental Protection Agency (USEPA) Contract Laboratory Programs (CLP) documents entitled, "National Functional Guidelines for Organic Data Review" and "National Functional Guidelines for Inorganic Data Review".
- Texas Risk Reduction Program understanding and rule application skills.

PUBLICATIONS AND PRESENTATIONS

- Smith, D.B., Loney, A.C., and Chan, V. 2009. *Quantifying Environmental Performance Using an Environmental Footprint Calculator*. Climate Change and Technology Conference, May 2009, Hamilton, Ontario.