



Alberta Environment and Parks
**Regulating Large
Industrial Facilities
Followup**

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Related Reports:

Regulating Large Industrial Facilities

- [Managing the Specified Gas Emitters Regulation Followup](#) (May 2017)
- [Systems to Manage the Specified Gas Emitters Regulation Followup](#) (July 2015, page 39)
- [Public Reporting on Climate Change Strategy—Climate Change, First Followup](#) (October 2012, page 35)
- [Climate Change and Emissions Management Fund—Use of Offsets Followup](#) (November 2011, page 15)
- [Response to Climate Change-Part 2](#) (October 2009, page 35)

Climate Change Strategy

- [Design of Systems to Manage the Climate Leadership Plan and Adaptation](#) (February 2018)
- [Climate Change Strategy Followup](#) (July 2014, page 39)
- [Alberta's Response to Climate Change](#) (October 2008, page 93)

Appointed under Alberta's *Auditor General Act*, the Auditor General is the legislated auditor of every provincial ministry; department; and most provincial agencies, boards, commissions, and regulated funds. The audits conducted by the Office of the Auditor General report on how government is managing its responsibilities and the province's resources. Through our audit reports, we provide independent assurance to the 87 Members of the Legislative Assembly of Alberta, and the people of Alberta, that public money is spent properly and provides value.

Report Highlights

Large industrial facilities generate

50
per cent

of Alberta's greenhouse gas emissions p.203

If emissions exceed limits, facility operators can:

- ✓ pay into the Technology Innovation and Emissions Reduction Fund
- ✓ buy emission offsets
- ✓ use emission performance credits

p.203

Alberta Environment & Parks (AEP)

regulates large industrial facilities under the *Technology Innovation and Emissions Reduction Regulation* by setting limits on their annual emissions; the regulation is a key element in Alberta's efforts to reduce emissions p.203



We found that AEP lacks assurance that emission offsets from conservation cropping are valid. We first identified this issue in 2009 p.203

Because AEP is eliminating emission offsets from conservation cropping after 2021, we are not repeating our previous recommendation p.207



If AEP does not ensure the offsets are valid:

- the government may not reduce emissions as planned
- money due from facilities to the government for excess emissions will not be collected

p.211



AEP implemented our recommendations to ensure:

- protocols meet requirements p.212
- Alberta Emissions Offset Registry data is accurate, complete and secure p.213



Emission offsets from conservation cropping have been the most used offsets that facilities bought to meet their emission limits p.207

Summary

Large industrial facilities—over 100 regulated facilities in 17 industrial sectors—generate 50 per cent of Alberta’s greenhouse gas emissions.⁵⁸ The Department of Environment and Parks (AEP) regulates these facilities under the *Technology Innovation and Emissions Reduction Regulation* by setting limits on the emissions facility operators can emit annually.⁵⁹ The regulation is a key element in Alberta’s efforts to reduce emissions.

To comply with the limits, facilities can reduce emissions by implementing operational improvements. If the emissions exceed the limit, facility operators can:

- pay into the Technology Innovation and Emissions Reduction Fund⁶⁰
- buy emission offsets
- use emission performance credits

We have audited AEP’s processes to regulate the facilities three times since 2009 and found deficiencies. In this audit, we found AEP has corrected the deficiencies, with one exception. AEP still lacks assurance emission offsets from conservation cropping are valid.

Because AEP is eliminating emission offsets from conservation cropping after 2021, we are not repeating our previous recommendation. However, AEP should still correct the deficiencies and reduce the risk and possible financial impact from invalid offsets.

Since 2007, facilities have paid \$230 million for 14 million tonnes of offsets from conservation cropping to meet their emission limits.⁶¹ If a significant volume of these offsets is invalid, Alberta’s efforts to reduce emissions will be diminished.

⁵⁸ Based on AEP’s data, large industrial facilities generated 146 million tonnes of greenhouse gas emissions in 2017.

⁵⁹ Large industrial facilities were previously regulated under the *Carbon Competitiveness Incentive Regulation* and the *Specified Gas Emitters Regulation*.

⁶⁰ Called the Climate Change and Emissions Management Fund under the *Carbon Competitiveness Incentive Regulation*.

⁶¹ The amounts include offsets generated under both the current conservation cropping and the previous tillage management protocols.

Glossary

Alberta Emissions Offset Registry	○ --- The Alberta Emissions Offset Registry is a web-based platform that lists emission offset projects based in Alberta and associated emission offset data.
Technology and Innovation Emissions Reduction Fund	○ --- Money paid by large industrial facilities for emissions above their annual limit. The government uses the money to support projects that reduce emissions and help adapt to the effects of climate change.
Conservation cropping	○ --- Farming with minimal disturbance of the soil from mechanical tillage. Conservation cropping minimizes the disruption of the soil's structure, composition and natural biodiversity. It leaves more emissions in the soil, lowers nitrous oxide released from the soil, and reduces fossil fuel used by farm equipment.
Conservation cropping protocol	○ --- Government requirements for implementation of conservation cropping projects. The protocol includes eligibility and record requirements, and methodologies to calculate emission offsets.
Emission offsets	○ --- Reductions or sequestration of greenhouse gas emissions from offset projects. Carbon sequestration is the capture and storage of greenhouse gas emissions that would otherwise be emitted to or remain in the atmosphere.
Emission performance credits	○ --- Emission reductions generated by large industrial facilities that have reduced emissions below their annual limit.
Fugitive emissions	○ --- Gas leaks from pressurized equipment and unintended sources. Fugitive emissions from tailings ponds are methane, carbon dioxide, and volatile organic compounds.
Greenhouse gas emissions	○ --- Emissions that contribute to the warming of the Earth's surface. The main greenhouse gases are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.
Large industrial facilities	○ --- Alberta facilities that emitted 100,000 tonnes or more of emissions in any year since 2003 in the following sectors: chemicals, coal mines, distillers, fertilizer plants, food processing, forestry products, gas processing, in situ, landfills, metals, minerals, oil sands, oil seed processing, pipelines, power plants, refining, and upgrading.
Megatonne	○ --- One megatonne equals one million tonnes.
Emission offset project	○ --- Project involving an activity or technology that reduces or sequesters greenhouse gas emissions without being legally required to do so.
Offset project developers	○ --- Non-regulated parties who implement offset projects.
Offset protocol developers	○ --- Stakeholders who develop protocols. The developers must meet government requirements when developing protocols.
Offset protocols	○ --- Procedures and methods that offset project developers must follow to estimate emission reductions or sequestration from offset projects.
Registry provider	○ --- An external party that operates the Registry. Since 2007, the Canadian Standards Association (CSA) Group has been operating the Alberta Emissions Offset Registry, in partnership with the Government of Alberta.
Verifiers	○ --- Independent third parties hired by facilities, offset project developers, or AEP to audit reported emission information.
Oil sands tailings pond	○ --- An engineered dam and dyke system used to capture oil sands tailings. Tailings are a mixture of water, sand, clay and residual bitumen. They are a by-product of the hot water treatment process used to separate oil from sand and clay.

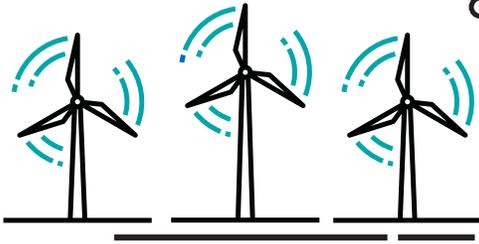
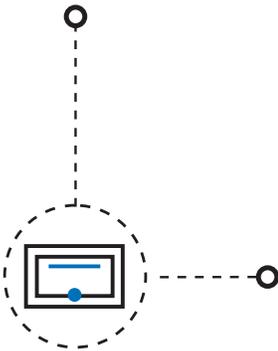
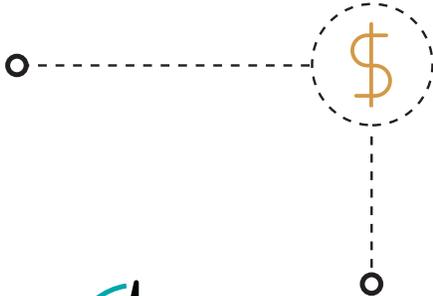
Background

What is an emission offset?

REGULATED FACILITY



Emission offset is a reduction of greenhouse gas emissions from an offset project, an activity or technology not regulated by government. Regulated facilities can buy emission offsets to off-set emissions above their annual limit. One emission offset is a one-tonne reduction in greenhouse gases.



EMISSION OFFSETS

OFFSET PROJECT

About this Audit

We audited how AEP managed the regulation in 2009 and 2011, and followed up on our recommendations in 2015 and 2017. This audit assessed whether AEP implemented the remaining recommendations.

Objective and Scope

The objective of our audit was to assess if AEP implemented our 2009⁶² and 2011⁶³ recommendations to:

- clarify the guidance to facilities, verifiers, offset project developers and offset protocol developers to ensure they consistently follow requirements
- implement processes to ensure that all approved offset protocols comply with government requirements
- obtain assurance that the Alberta Emissions Offset Registry⁶⁴ data is accurate, complete and secure

Our audit focused on areas where we previously found deficiencies.

Criteria

We used the audit criteria from our original audits and updated them to match the areas where our previous audit found remaining deficiencies. Management agreed with the suitability of the criteria.

What We Examined

Our audit examined AEP's processes to:

- manage the risk of invalid emission offsets from conservation cropping
- ensure oil sands facilities comply with requirements for estimating fugitive emissions from tailings ponds
- prioritize and review offset protocols
- ensure accurate, secure and complete data in the Alberta Emissions Offset Registry

We conducted our fieldwork between March 2019 and July 2019, and completed our audit in October 2019.

⁶² *Report of the Auditor General of Alberta—October 2009*, page 49.

⁶³ *Report of the Auditor General of Alberta—November 2011*, page 17 and page 23.

⁶⁴ Alberta Emissions Offset Registry, <http://www.csaregistries.ca/albertacarbonregistries/home.cfm>.

Conclusion

AEP did not implement our recommendation to:

- clarify its guidance to facilities, verifiers, offset project developers, and offset protocol developers so they consistently follow requirements

AEP remedied all deficiencies we identified previously, except for the issue of conservation cropping offsets. However, as AEP is eliminating the conservation cropping offsets effective December 31, 2021, we are not repeating our recommendation in this report.

AEP implemented our recommendations to:

- set up processes to ensure that all approved protocols comply with government requirements
- obtain assurance that data hosted and processed by the Registry provider is accurate, complete and secure



Why This Conclusion Matters to Albertans

Emission offsets from conservation cropping have been the most used offsets that facilities bought to meet their emission limits.⁶⁵ If AEP does not ensure the offsets are valid, the government may not reduce emissions as planned. Further, money due from facilities to the government for excess emissions will not be collected.

Summary of Recommendations

NOT IMPLEMENTED:
Clarify guidance for system participants

AEP did not clarify the guidance to facilities, verifiers, offset project developers, and offset protocol developers so they consistently follow requirements.

AEP corrected all deficiencies we identified previously except for the issue of conservation cropping offsets.

IMPLEMENTED Recommendation:
Ensure protocols meet requirements

AEP set up processes to ensure that all approved protocols comply with government requirements.

IMPLEMENTED Recommendation:
Ensure registry data is accurate, complete and secure

AEP obtained assurance that data hosted and processed by the Registry provider is accurate, complete and secure.

⁶⁵ Includes offsets generated under both the current conservation cropping and the previous tillage management protocols.

How Alberta's emission offset system works

Alberta has the highest overall emissions of all Canada's provinces and territories. Alberta's emissions have increased 18 per cent since 2005, and reached 273 megatonnes (Mt) in 2017.⁶⁶

AEP expects that the *Technology Innovation and Emissions Reduction Regulation* would decrease Alberta's emissions by 28 Mt by 2020 and 51 Mt by 2030.⁶⁷

The Alberta emission offset system forms part of the regulation and enables regulated facilities to purchase emission offsets to meet annual emission limits.

The emission offset system creates a financial incentive for Albertans (farmers, municipalities, industry) to innovate and engage in activities that reduce greenhouse gas emissions



Offset Protocol

Procedures and methods that parties must follow to estimate emission reductions or sequestration from a non-regulated activity.



Offset Project

Project involving an activity or technology that reduces or sequesters greenhouse gas emissions without required to do so by law.



Verifier

Independent third party hired by a facility, offset project developer, or AEP to audit reported emission information.



Alberta Emissions Offset Registry

Web-based platform that lists emission offset projects based in Alberta and associated emission offset data. CSA Group, a non-profit association, is the Registry provider, in coordination with the Government of Alberta.



Regulated Facility

Alberta facilities that emitted 100,000 tonnes or more of emissions in any year since 2003. If facility's emissions exceed the limit, they can:

- pay into the Technology and Innovation Emissions Reduction Fund.
- buy emission offsets.
- use emission performance credits.

⁶⁶ National Inventory Report 1990-2017: Greenhouse Gas Sources and Sinks in Canada, page 12. http://publications.gc.ca/collections/collection_2019/eccc/En81-4-1-2017-eng.pdf

⁶⁷ Emission outcomes from the *Technology Innovation and Emissions Reduction Regulation* are expected to be relatively unchanged (from the previous *Carbon Competitiveness Incentive Regulation*) since the \$30 per tonne price signal is preserved. These emission outcomes are outlined in the *Climate Leadership Plan Progress Report 2017-2018*. <https://open.alberta.ca/dataset/83285ecd-dbbe-4b6f-a1a2-ceaebf289fa3/resource/f6b4da5f-76d7-4ed2-9fd7-9a133c323440/download/clp-progress-report-2017-18-final.pdf>. The expected emissions decrease is relative to business-as-usual, a projection of emissions that would have occurred in the absence of the regulation.

Protocol Developer's Role

- Develop new offset protocol or revise an existing protocol.
- Engage relevant academic, industry and assurance experts in the protocol development.

AEP's Role

- Establish rules for protocol development.
- Review draft protocol to ensure it meets government requirements.
- Approve or reject protocol.
- Annually review a sample of approved protocols to ensure they continue to meet requirements. Update or withdraw protocols based on the review results.

Project Developer's Role

- Implement an offset project i.e. carry out an activity in accordance with the relevant offset protocol.
- Calculate offsets generated from the project.
- Maintain required data and records to support claimed offsets.
- Obtain assurance from third party verifier that the offsets meet requirements.
- Submit offset project documents to the Alberta Emission Offset Registry.

AEP's Role

- Establish rules for project developers.
- Annually audit a sample of offset projects.
- Ensure project developers correct material errors and deficiencies identified by verifier in the current project, and immaterial ones in future projects.

Verifier's Role

- Audit an offset project to ensure it meets government requirements and the claimed offsets are correct (free of material errors).
- Report immaterial errors and deficiencies to project developer and AEP.

AEP's Role

- Establish rules for verifiers.
- Hire verifiers to audit a sample of offset projects.
- Confirm that project developer corrected immaterial errors and deficiencies identified in previous audits.

Registry Provider's Role

- Perform Registry services in accordance with the contract.
- Ensure Registry data is complete, secure and reliable.

AEP's Role

- Provide operational requirements the Registry provider must follow.
- Obtain periodic reports from the Registry provider to assure that the Registry data is complete, secure and reliable.

Facility's Role

- Annually report to AEP on emissions and on how it met the annual emissions limit.
- Submit required information on the calculation of fugitive emissions from tailings ponds.

AEP's Role

- Establish rules for facilities.
- Review facility emission reports.
- Review facility reports on fugitive emissions from tailings ponds to verify compliance with requirements.
- Audit a sample of facility reports to verify facility complied with requirements, including those for emissions from tailings ponds.



Areas covered by the Office of the Auditor General of Alberta

Detailed Findings and Recommendations

Clarify Guidance for System Participants

NOT IMPLEMENTED

Our examination covered two areas where our previous followup found remaining deficiencies:

- **offsets from conservation cropping - deficiencies not corrected**
- **fugitive emissions from tailings ponds - deficiencies corrected**

Ensure offsets from conservation cropping are valid

Context

Emission offsets represent voluntary emission reductions. When parties not subject to the regulation reduce emissions, they can sell emission offsets to regulated facilities who use offsets to compensate for emissions above the facility's annual limit.

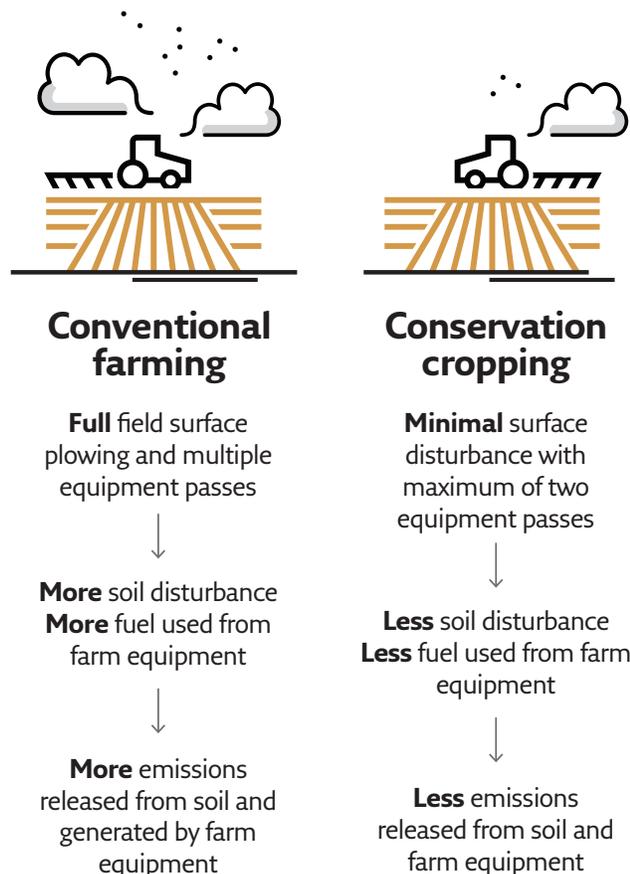
Conservation cropping generates emission offsets primarily because it increases emissions storage in the soil and leads to reduced fuel usage compared to conventional farming practices.

A conservation cropping project combines emission offsets from many farms. Offset project developers are expected to manage the project to ensure government requirements are met.

The project developer must have the offset project verified to obtain independent assurance the project complies with requirements, and that the calculated offsets are accurate. The verified offsets are listed in the Registry where regulated facilities can buy them. AEP's independent verifier annually audits a sample of the offset projects the facilities have used to give additional assurance that offset projects meet requirements.

AEP's requirements for conservation cropping projects, described in the conservation cropping protocol, include the minimum required records. Our previous audits found the records AEP requires are inadequate to support an audit opinion on the emission offsets claimed.

How does conservation cropping generate emission offsets?



Criteria

AEP should evaluate and manage the risk of invalid emission offsets from conservation cropping.

Our followup audit findings

Key Findings

- Records required for conservation cropping offsets are insufficient to ensure the offsets are valid.
- AEP did not enforce the records required for conservation cropping offsets.

Records required for conservation cropping are insufficient

Our 2015 followup audit found the records required for conservation cropping offsets were inadequate to prove the emission offsets are valid. We found that only farm records are required to support tilling, fertilizing and other activities that disturb the land. Adequate records should include independent corroborating evidence, such as sign off by a professional agrologist who reviewed farm records and confirmed that land disturbance activities meet requirements.

AEP agreed that the record requirements are weak but has not changed them.

AEP did not enforce record requirements

AEP's independent verifiers repeatedly found that project developers did not have the required, weak records. The verifiers concluded that the impact is immaterial but did not always back up that conclusion. Missing records do not mean that the offsets are invalid. However, by accepting these offsets AEP failed to enforce its own rule that it will reject offsets that do not have the required records.⁶⁸

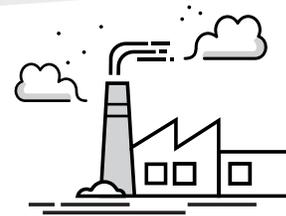
As a result, some emission offsets listed on the Registry, and bought by facilities to meet emission limits, could be invalid. We were unable to estimate the financial impact to the government from the potentially invalid offsets.

Consequences of not taking action

The emission offsets regulated facilities use to comply with the regulation could be invalid. Invalid offsets will impair the effectiveness of Alberta's efforts to reduce emissions, and may result in lost revenue to Albertans.⁶⁹

Lack of enforcement also increases the likelihood of non-compliance and abuse.

What makes an offset invalid?



Valid offsets must be demonstrable and verifiable. Invalid offsets lack one or both of the characteristics.



NOT DEMONSTRABLE

Project developer does not have the records to prove the activity was carried out in accordance with the government requirements



NOT VERIFIABLE

Independent third party cannot rely on the records supporting the emissions reduction activity

Why it matters?



Claimed offsets may not be true emission reductions.



Alberta may not achieve emission reduction targets.



Government may not collect money due from facilities for excess emissions.

⁶⁸ AEP requires project developers to obtain records indicating tilling activity on each farm field included in the project, to confirm that tilling did not exceed the 10 per cent allowed under the protocol. Tilling in excess of 10 per cent disqualifies the field, and the associated offsets, from the project. But AEP allowed offsets from fields that lacked records of tilling activity.

⁶⁹ If a regulated facility uses an invalid offset to compensate for excess emissions, it must pay AEP \$30 for each excess tonne.

Ensure facilities follow guidance for estimating fugitive emissions from tailings ponds

Context

Five oil sands facilities in Alberta are covered by the regulation. They must annually estimate and report fugitive emissions from tailings ponds to AEP. In 2014, AEP released guidance describing the method and minimum requirements for estimating these emissions. AEP expects the emission estimates to be more reliable when facilities use a consistent approach to measure and quantify the emissions. The tailings ponds emissions represent two to eight per cent of the five oil sands facilities' annual emissions.

Our 2015 followup audit found AEP lacked assurance the oil sands facilities met the requirements.

Criteria

AEP should ensure facilities meet its requirements for estimating annual fugitive emissions from tailings ponds. AEP should update the requirements based on the results of its assurance processes.

Our followup audit findings

AEP implemented a review process focused on assessing fugitive emissions estimates of the five oil sands facilities. The assessment involves reviewing facility reports – describing the procedures used to measure the emissions and the results – and assessing the procedures for compliance with AEP's requirements. AEP found all facilities met minimum requirements. We found no significant issues with AEP's process or conclusions.

Ensure Protocols Meet Requirements

IMPLEMENTED

Context

Offset protocols describe the methods offset project developers must follow to estimate the emission reductions from offset projects. There are currently 24 approved protocols in Alberta for projects such as wind-powered electricity generation, landfill gas capture and combustion, and conservation cropping.⁷⁰ AEP periodically reviews protocols to determine alignment with policy requirements, and to ensure the activities covered are still eligible to generate offsets.⁷¹

Our 2011 and 2015 audits found AEP did not have a systematic process for reviewing the protocols, and lacked evidence the activities covered by protocols were still eligible for offsets.⁷²

Criteria

AEP should use a risk-based approach to rank protocols for review, and then revise or withdraw protocols based on review results. AEP's review should ensure activities covered by the protocols are eligible to generate offsets.

Our followup audit findings

AEP implemented a risk-based approach and procedures to prioritize and review protocols. AEP reviews protocols annually and revises or withdraws protocols based on the review results. Revised protocols are available for public comment prior to implementation.

AEP improved procedures to determine if an activity covered by a protocol is, or continues to be, eligible to generate emission offsets. We evaluated the design of the new procedures and found no issues. We did not assess if the procedures operate effectively because they were not yet implemented.

⁷⁰ <https://www.alberta.ca/alberta-emission-offset-system.aspx#toc-2>.

⁷¹ Eligible activities must be incremental to normal industry practices. If an activity is applied by more than 40 per cent of the sector, it is assumed to be a normal industry practice, unless barriers exist that would prevent adoption by the rest of the sector.

⁷² AEP's review of protocols aims to ensure that the protocols are technically robust, verifiable and transparent, and based on strong evidence that the offset activities go beyond normal industry practices.

Ensure Registry Data is Accurate, Complete and Secure

IMPLEMENTED

Context

AEP relies on an external Registry provider to list and track the emission offsets in the Registry, manage transactions, and maintain data security. AEP also relies on the Registry provider to check for duplicate emission offsets.⁷³ Errors in these areas can produce invalid offsets.

Because AEP outsourced the management of the Registry, it needs assurance the Registry provider has effective controls, and that the Registry data is credible and secure.

A service auditor's report⁷⁴ is a standard process for an organization to obtain assurance a service provider is performing the required functions appropriately. The report provides reasonable assurance on the design, implementation and effectiveness of the service provider's internal controls relevant to the organization's objectives.

Our 2009 and 2017 audits found that AEP lacked this assurance.^{75,76}

Criteria

AEP should have periodic assurance that the Registry data is reliable and secure, and that it has no duplicate emission offsets.

Our followup audit findings

AEP obtained a service auditor's report on the Registry provider's processes. The report confirms the provider had effective systems to perform the required Registry functions during August to December 2017, including annual checks for duplicate emission offsets within the Registry. AEP implemented effective processes to detect emission offsets posted to both Alberta's Registry and other key registries.

AEP's new contract with the Registry provider requires the next service auditor's report, by December 2020, to confirm the continued completeness, accuracy and security of the Registry data.

Audit Responsibilities and Quality Assurance Statement

AEP's management is responsible for the systems to regulate the large industrial emitters under the *Technology Innovation and Emissions Reduction Regulation*, and to ensure the Alberta Emissions Offset Registry data is accurate, complete and secure.

Our responsibility is to express an independent conclusion on whether AEP has improved these systems in areas where our previous audits identified deficiencies.

We conducted our audit in accordance with Canadian Standard on Assurance Engagements 3001 issued by the Auditing and Assurance Standards Board (Canada). The Office of the Auditor General applies Canadian Standard on Quality Control 1 and, accordingly, maintains a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements. The office complies with the independence and other ethical requirements of the Chartered Professional Accountants of Alberta Rules of Professional Conduct, which are founded on fundamental principles of integrity and due care, objectivity, professional competence, confidentiality and professional behaviour.

⁷³ Duplicate offsets occur when the same offsets are listed more than once on the Registry, or the same offsets are on the Alberta Registry and another registry.

⁷⁴ Canadian Standard for Assurance Engagements 3416 has requirements for assurance engagements to report on controls at organizations that provide services to other entities. The associated report is commonly called a service auditor's report.

⁷⁵ *Report of the Auditor General of Alberta—October 2009*, page 49.

⁷⁶ *Report of the Auditor General of Alberta—May 2017*, page 62.



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