



KPMG LLP
Chartered Professional Accountants
777 Dunsmuir Street
Vancouver BC V7Y 1K3
Tel 604-691-3000
Fax 604-691-3031
www.kpmg.ca

Independent Service Auditor's Report

To: The Government of Alberta, Department of Energy (Alberta Energy)

Scope

We have been engaged to report on the Government of Alberta, Energy Sector's accompanying statement titled "Statement by Management of the Government of Alberta, Energy Sector" (statement) that the controls within Alberta Energy's Petrinex system (Petrinex or system) were effective throughout the period May 1, 2018 to April 26, 2019, to provide reasonable assurance that Alberta Energy's service commitments and system requirements for Petrinex were achieved based on the trust services criteria relevant to security, availability, processing integrity, and confidentiality (applicable trust services criteria) set forth in TSP section 100, *2017 Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy* (AICPA, *Trust Services Criteria*).

Service Organization's Responsibilities

Alberta Energy is responsible for its service commitments and system requirements for Petrinex and for designing, implementing, and operating effective controls within the system to provide reasonable assurance that Alberta Energy's service commitments and system requirements for Petrinex were achieved. Alberta Energy has also provided the accompanying statement about the effectiveness of controls within the system. When preparing its statement, Alberta Energy is responsible for selecting, and identifying in its statement, the applicable trust service criteria and for having a reasonable basis for its statement by performing an assessment of the effectiveness of the controls within the system.

Our Independence and Quality Control

We have complied with the relevant rules of professional conduct / code of ethics applicable to the practice of public accounting and related to assurance engagements, issued by various professional accounting bodies, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.



The firm applies Canadian Standard on Quality Control 1, *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance Engagements*, 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.

Service Auditor's Responsibilities

Our responsibility, under this engagement, is to express an opinion, based on the evidence we have obtained, on whether management's statement, that controls within the system were effective throughout the period to provide reasonable assurance that Alberta Energy's service commitments and system requirements for Petrinex were achieved based on the applicable trust services criteria, is fairly stated in all material respects.

Our engagement was conducted in accordance with Canadian Standard on Assurance Engagements 3000, *Attestation Engagements Other than Audits or Reviews of Historical Financial Information*, set out in the CPA Canada Handbook – Assurance. This standard requires that we plan and perform our engagement to obtain reasonable assurance about whether management's statement is fairly stated, in all material respects. We believe that the evidence we obtained is sufficient and appropriate to provide a reasonable basis for our opinion.

Our reasonable assurance engagement included:

- obtaining an understanding of the system and the service organization's service commitments and system requirements for Petrinex;
- assessing the risks that controls were not effective to achieve Alberta Energy's service commitments and system requirements for Petrinex based on the applicable trust services criteria; and
- performing procedures to obtain evidence about whether controls within the system were effective to achieve Alberta Energy's service commitments and system requirements for Petrinex based the applicable trust services criteria.

Our engagement also included performing such other procedures as we considered necessary in the circumstances.

Inherent Limitations

There are inherent limitations in the effectiveness of any system of internal control, including the possibility of human error and the circumvention of controls.

Because of their nature, controls may not always operate effectively to provide reasonable assurance that the service organization's service commitments and system requirements were achieved based on the applicable trust services criteria. Also, the projection to the future of any conclusions about the effectiveness of controls is subject to the risk that controls may become ineffective



because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

Opinion

In our opinion, management's statement that the controls within Alberta Energy's Petrinex system were effective throughout the period May 1, 2018 to April 26, 2019 to provide reasonable assurance that Alberta Energy's service commitments and system requirements for Petrinex were achieved based on the applicable trust services criteria, is fairly stated in all material respects.

Subsequent Event

As described above, this report relates to controls for Petrinex for the period May 1, 2017 to April 26, 2019. On April 27, 2019, as part of a Government of Alberta-wide Information Management and Technology Transformation program, the Petrinex application and data were migrated from Alberta Energy's network environment to infrastructure managed by Service Alberta. Accordingly, effective April 27, 2019 a number of controls related to Petrinex have changed and are now under the responsibility of Service Alberta on behalf of Alberta Energy. This engagement does not address the resulting changes to the Petrinex environment and controls subsequent to April 26, 2019.

KPMG LLP

A handwritten signature in black ink that reads 'KPMG LLP'. The signature is written in a cursive, slanted style. Below the signature is a long, horizontal, slightly curved line that extends across the width of the signature.

Vancouver, Canada

July 23, 2019

Statement by Management of the Government of Alberta, Energy Sector

We are responsible for designing, implementing, operating, and maintaining effective controls within the Government of Alberta, Department of Energy's (Alberta Energy) Petrinex system (Petrinex or system) throughout the period May 1, 2018 to April 26, 2019, to provide reasonable assurance that Alberta Energy's service commitments and system requirements for Petrinex relevant to security, availability, processing integrity, and confidentiality were achieved. Our description of the boundaries of the system is presented in attachment A and identifies the aspects of the system covered by our statement.

We have performed an evaluation of the effectiveness of the controls within the system throughout the period May 1, 2018 to April 26, 2019, to provide reasonable assurance that Alberta Energy's service commitments and system requirements for Petrinex were achieved based on the trust services criteria relevant to security, availability, processing integrity, and confidentiality (applicable trust services criteria) set forth in TSP section 100, *2017 Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy* (AICPA, *Trust Services Criteria*). Alberta Energy's objectives for the system in applying the applicable trust services criteria are embodied in its service commitments and system requirements for Petrinex relevant to the applicable trust services criteria. The principal service commitments and system requirements for Petrinex related to the applicable trust services criteria are presented in attachment B.

There are inherent limitations in any system of internal control, including the possibility of human error and the circumvention of controls. Because of these inherent limitations, a service organization may achieve reasonable, but not absolute, assurance that its service commitments and system requirements are achieved.

We confirm that the controls within the system were effective throughout the period May 1, 2018 to April 26, 2019, to provide reasonable assurance that Alberta Energy's service commitments and system requirements for Petrinex were achieved based on the applicable trust services criteria.

Government of Alberta, Energy Sector

Susan Wilson-Ferguson
Sector CIO, Environment and Energy

July 23, 2019

Attachment A:**Alberta Energy's Description of the Boundaries of Petrinex****Services Provided**

Petrinex is a central, electronic repository of volumetric and infrastructure data related to Alberta's, British Columbia's (beginning in November 2018), and Saskatchewan's upstream oil and gas industry.

Petrinex serves three distinct functions:

- It is a central database for all of the volumetric and infrastructure data related to Alberta's, British Columbia's and Saskatchewan's upstream oil and gas industry;
- It is a communication tool enabling Alberta Energy, the Government of British Columbia, the Government of Saskatchewan, and industry stakeholders to exchange and analyse accurate information quickly and efficiently; and
- It is an analysis tool. As an analysis tool, Petrinex avoids common mathematical errors by saving the information in its most basic form and then performing calculations as required.

The following is a brief summary of the activities that can be performed on Petrinex (whether it be online, batch or both):

- Volumetric Reporting
 - Stream Allocation/Owner Allocation Reporting
 - Pipeline Split and Transportation Allowance Reporting
 - Infrastructure Reporting (Wells, Facilities, Business Associates, etc.)
 - Raw Gas Allocations Reporting
 - Allowable Cost Reporting
 - Crude By Rail Reporting
 - Shipper's Balance
 - Oil Forecast Tool
 - Drilling and Completion Cost Reporting
 - Report requests on dozens of pre-defined reports
 - Download Ministry Statements and Reports
 - Information Download capabilities
 - Changes to user profiles by the respective User Security Administrator
-

- Oil Valuation
- Royalty Tax Payer
- Enhanced Production Audit Program (EPAP)
- Enhanced Production Valuation Program (EVAP)
- Production Allocation Discrepancy (PAD)

Petrinex facilitates the activities outlined above by means of data uploads, downloads, and e-mail. Petrinex provides the tools and data primary users need for two-way communication with regulatory bodies, working-interest owners, pipeline companies, shippers, purchasers, and other business associates.

Petrinex is accepted as the single, authoritative petroleum data source and the data it houses is considered the "data-of-record" for all stakeholders. All data is available in one place. Since all stakeholders have access to Petrinex data, and since the same data can be used for a variety of purposes, there is no need for multiple submissions to multiple stakeholders.

Infrastructure

Petrinex has a separate Active Directory (ADS) domain with a dedicated IT infrastructure. There are three separate environments for Development, Acceptance Testing and Production. All security zones related to the Development, Acceptance Testing and Production environments are further isolated from one another at the network layer by one or more firewalls, and in the case of production, it is separated from the Alberta Energy network as well.

The following Network controls are in place: Firewalls, Change/Configuration Management, Internetworking Devices, Remote Connectivity, Intrusion Detection and Prevention Systems (IDS/IPS), 3rd party audit, and Disaster Recovery Planning (DRP).

Software

Petrinex utilizes a web-based system for its automated business functions and processes that facilitate fast, standardized, safe and accurate management/exchange of key volumetric, royalty and commercial information associated with the upstream petroleum sector.

Petrinex interacts with Ministry business systems through a number of interfaces. It makes data available through Internet access via browsers, lookup tools, and reports. Petrinex's web-based interface provides users with online access to information. It makes it possible for data to be uploaded directly from industry systems and allows stakeholders to submit and edit their data online.

People

Petrinex is a joint strategic organization supporting Canada's upstream oil and gas industry, and streamlines the way upstream petroleum companies exchange information with the Alberta Energy Regulator (AER), the Alberta Department of Energy (Alberta Energy); the BC Ministries

of Finance and Energy, Mines and Petroleum Resources; the BC Oil and Gas Commission; the Government of Saskatchewan; and Industry partners.

Petrinex is comprised of several key functional units tightly integrated to enable quality performance from the Petrinex application and the needs of Petrinex's vast stakeholders to be continually met. The Petrinex team was assembled through an arrangement between the Industry sector [supported by the respective Canadian Association of Petroleum Producers (CAPP) and Explorers and Producers Association of Canada (EPAC) governing bodies], the Alberta Energy Regulator (AER), and ministries of the governments of Alberta, British Columbia, and Saskatchewan, in which full time resources from each of the entities were contracted to work exclusively on Petrinex. The Industry resources are managed by the Industry Team Manager, who oversees the activities of the Industry Team. This is a unique precedent set by Petrinex in which all stakeholders groups can interact with each other on a continual basis to address any emerging issues that may arise on a daily basis.

Overseeing the entire operations of Petrinex is the Petrinex Chief Executive Officer, who is responsible to ensure not only that the immediate operational needs of Petrinex stakeholders are continually being met, but also that the strategic direction of Petrinex as set by the Petrinex Executive Board is followed and adhered to within the respective functional units of Petrinex.

The following is a brief summary of the distinct functional units within Petrinex:

- **Petrinex Business Desk:**

- Headed by the Business Desk Team Lead, the Business Desk is the first-point-of-contact for Industry, AER, Alberta Energy and the Governments of British Columbia and Saskatchewan regarding utilization of Petrinex.
- All incidents submitted by Industry, Alberta Energy, AER and the Governments of British Columbia and Saskatchewan users are recorded within the ITSM incident management system.
- Incidents are prioritized based upon their business impact as defined in the Petrinex Business Change Management Process.
- The Business Desk attempts to resolve the majority of incidents themselves.
- A Knowledge Database is collectively maintained by the Petrinex Business Desk team and the Petrinex Subject Matter Experts.
- Regular daily and weekly statistical reporting on events, operational issues and performance metrics.
- The Petrinex Business Desk Leader leads and manages the Petrinex Daily Operations meetings (Petrinex team, Industry, AER, Alberta Energy and the Governments of British Columbia and Saskatchewan members present).

- **Petrinex Change Management Team:**

- Headed by the Petrinex Business Operations Director, the Change Management Team meets on a weekly basis and is comprised of members from all stakeholder groups (Petrinex, Alberta Energy, AER, the Governments of British Columbia and Saskatchewan, and Industry).
- The Change Management team employs a rigorous change management process to assure that all change items are adequately vetted, prioritized, scheduled, tested and implemented.
- The Change Management team is responsible to ensure that the System Delivery Lifecycle methodology is consistently applied to all change items.

- **Petrinex Application Maintenance and Support (AMS) Team:**

- Headed by the on-site AMS manager, the AMS team is responsible to ensure that Petrinex consistently meets stakeholder performance/processing expectations not only on a day to day basis, but also on an hour to hour basis.
- The Application and Maintenance team manages the day to day activities of Petrinex, with hardware, network and general system support provided by the Service Alberta Energy Sector Production Support Team [formerly the Alberta Energy Information Technology Branch; in May 2018, the Government of Alberta initiated a workforce transformation to create a sector resource centric approach; as part of this transformation Alberta Energy's Information Technology Branch personnel were transitioned into the Service Alberta Energy Sector Production Support Team, and continue to maintain the Petrinex application and infrastructure].
- The AMS manager is responsible to ensure that his team of application developers, DBA's, Production Operations analysts and Change Management analysts are immediately available to address any issue that may arise, in addition to being responsible to ensure that the operational needs of Petrinex are addressed, both currently and in the future.
- The Application and Maintenance team adopts practices for securing web applications as recommended by the "Open Web Application Security Project (OWASP)".

- **Petrinex Communications Coordinator:**

- The Petrinex Communications Coordinator is responsible to ensure that timely communication (tips/alerts/broadcast messages, links to relevant documents) is provided to Petrinex stakeholders on the Petrinex website.
- The targeted communications are intended to be succinct, accurate and provide enough information to be useful to the intended audience.

- **Petrinex Training Coordinator:**

- The Petrinex Training Coordinator is responsible to ensure that Petrinex's comprehensive online training system (comprised of dozens of individual training modules) is available to all its registered users. The modules are to be constantly reviewed (in light of any change items implemented that have an impact to the modules) to keep the information current, informative and accurate.

Data

Petrinex is a central, electronic repository of volumetric and infrastructure data related to Alberta, British Columbia, and Saskatchewan's upstream oil and gas industry. Petrinex contains records of wells, facilities, business associates, operators of record, and company contacts. It replaced, or streamlined, many previous methods of distributing and obtaining volumetric, allocation, valuation, and pipeline split information.

Data is received by Petrinex from clients securely logging in to the application and submitting data in one of two main manners: online or batch. The data is validated by Petrinex and then, when applicable, sent to the applicable Ministry for further use in its business processes. The output from the applicable Ministry is then sent back to Petrinex for the end-user to access at specified periods in the submission cycle.

Data is validated before it is accepted into Petrinex. Once it is posted, all stakeholders can "read from the same page." That is, they can access the same view of the data at the same time. If there are errors, or if data is missing, operators receive prompt, electronic notification. This gives them the opportunity to correct mistakes and avoid potential compliance penalties or provisional assessments.

To avoid mathematical calculation errors, Petrinex data is stored in its most granular form. Petrinex is capable of making calculations and deriving other types of information on the basis of these granular elements. For example, Petrinex users submit allocation factors to Petrinex. Petrinex applies these factors to total volumes in order to derive the volumes for which particular owners are responsible. It calculates sum totals and locates cross-references. This provides mathematical accuracy and assures that all data in Petrinex remains "in balance."

Processes and Procedures

Petrinex has incorporated the following procedures:

- Incident Response Procedures
 - Change Management Procedures
 - Emergency Response Procedures
 - Business Resumption and Disaster Recovery Procedures
 - Security administration and monitoring procedures
 - Security auditing and log analysis procedures
-

- Performance monitoring procedures
- Interest Expressed from Outside Parties Procedures
- Founding Stakeholder Initiated Enhancement Procedures
- Petrinex Central Security Administrator Procedures
- Petrinex Document Release Protocol Procedures
- Communication Procedures, including Media Contact Procedures
- Enhanced Production Audit Program (EPAP)
- Enhanced Production Valuation Program (EVAP)

Attachment B:**Alberta Energy's Principal Service Commitments and System Requirements for Petrinex**

Alberta Energy designed the processes and procedures related to Petrinex to facilitate efficient, standardized, safe and accurate management /exchange of "data of record" information essential to the operation of the petroleum sector. Those objectives are based on the service commitments that Alberta Energy and Petrinex make to user entities, the laws and regulations that govern the provision of Petrinex services and the financial and operational requirements that have been established to deliver those services.

Security, confidentiality, processing integrity and availability commitments to user entities are documented and communicated in the description of the service offering provided online. These commitments are standardized and include, but are not limited to, the following:

- Security and confidentiality commitments:
 - Security principles implemented within Petrinex are designed to permit system users to access the information they need based on their role in the system, while restricting them from accessing information not needed for their role. Security protocols are designed to ensure that proprietary/confidential data is accessible only to authorized users. Shared data is accessible and usable by entitled Industry and Ministry stakeholders only. Access to data in the public record is unrestricted.
 - Encryption technologies are used to protect the confidentiality of user data in transit.
 - Proprietary/confidential data is retained and/or disposed of in accordance with:
 - applicable Government of Alberta policies, directives, and standards, or
 - as directed by the Governments of British Columbia or Saskatchewan (when applicable).
- Expectations of service provision and availability: Petrinex services are generally available 15 hours a day, Monday to Saturday, with occasional Sunday openings. These services are not available 24 hours a day due to regular maintenance activities. Petrinex users are encouraged to view the exact hours of operation on a given day/month within the "Business Desk" area of the Petrinex website.
- Processing integrity commitments: Petrinex includes built-in edit and error checking to enable consistent and timely processing of data submissions, and consistent automated calculations based on granular data to enable mathematical accuracy.

Alberta Energy establishes operational requirements that support the achievement of its system commitments, relevant laws and regulations, and other system requirements. Such requirements are communicated in Alberta Energy's system policies and procedures, system design documentation, and in relevant contracts and agreements.

Operational policies define an organization-wide approach to how systems and data are protected, administered, maintained and made available. These include policies around how the service is designed and developed, how the system is operated, how the system and network are managed, and how employees are hired and trained. In addition to these policies, standard operating procedures have been documented on how to carry out specific manual and automated processes required in the operation, development, and maintenance of Petrinex.