



Environmental Audits – Offshore Seismic Operations, Refineries and Service Stations



ARPEL Reference Manual

*Environmental Audits – Offshore Seismic Operations,
Refineries and Service Stations*

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Disclaimer

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Warning to Users

This document contains a description of standard environmental auditing procedures, including information on audit planning, execution, reporting, and follow up. The appendices to the document contain audit checklists that were prepared to be used for audits of PCJ's refinery, service station/storage facilities, and offshore seismic operations. However, the core document, checklists and other audit tools can be used by other oil and gas companies although they should be adapted to their specific –local- regulatory framework and/or corporate procedures.



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1.0 Introduction

The document contains a description of standard environmental auditing procedures, including information on audit planning, execution, reporting, and follow up. The appendices to the document contain audit checklists that –although developed for PCJ’s refinery, service station/storage facilities, and offshore seismic operations- can be adapted for their use by other companies (“the users”) with that type of operations. The appendices also contain forms that can be used by the audit teams. The checklists and other audit tools can and should be modified and updated by the users as their audit programs progress.

The audit planning and execution information is based on ISO 19011, *Guidelines for quality and/or environmental management systems auditing* (International Organization for Standardization, 2002), and on CSA Z773-03, *Environmental Compliance Auditing* (Canadian Standards Association, 2003).

The overall audit process is shown in Figure 1.

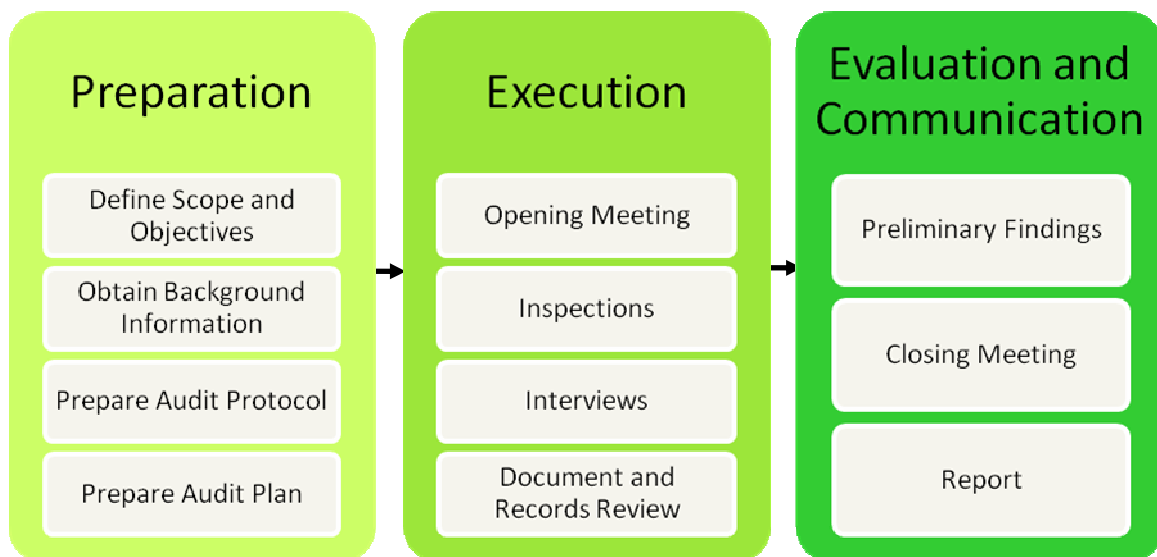


Figure 1- Overall Audit Process

1.1 Principles of Auditing

The principles of auditing are shown in Figure 2 and described below.

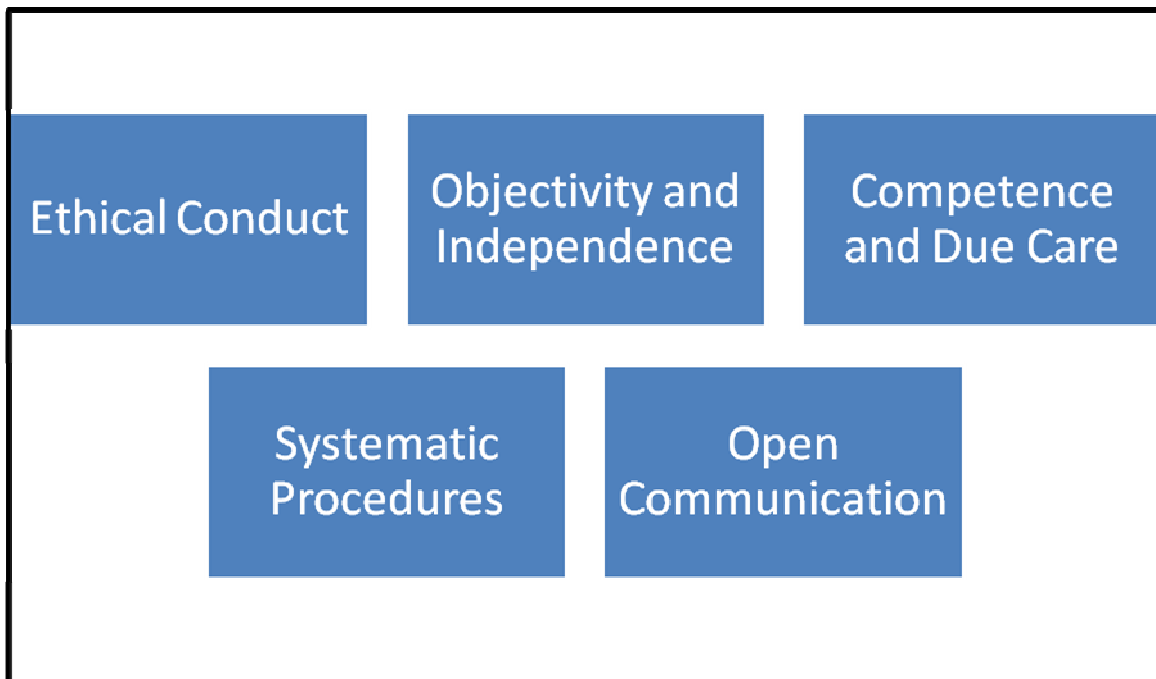


Figure 2- Principles of Auditing

1.1.1 Ethical Conduct

Trust, integrity, confidentiality and discretion are essential to auditing. Audits completed for the users are to remain the confidential property of the user. Auditors shall not disclose information without the permission of the user. Legal counsel should be consulted by the user if any issue is identified which could lead to legal liability for the user. This contact should be made by senior personnel of the companies.

1.1.2 Objectivity and Independence

The objectivity and independence of auditors is critical to the success of an audit program. Each member of the audit team must be independent of the audit client. Auditors cannot audit their own work. When selecting the audit team, care must be taken to select auditors with appropriate seniority to complete the audit, and yet not so much seniority that interviewees are intimidated. There should be a clear separation of the auditors and the auditee. In an internal audit, the assessment of independence is somewhat subjective, and should be assessed by both the auditor and auditee. Also give consideration to the perception that auditors who lack independence may lack objectivity.

1.1.3 Competence and Due Care

The audit team must include personnel with appropriate training, skills and knowledge to complete a technically sound audit. The audit team must possess an understanding of the audit process and also a technical understanding of the facilities being audited.

As described in Z763-03 (CSA, 2003), *“an auditor must use the care, diligence and good judgement of any auditor under similar circumstances”*. The test: a second audit team working at the same time should be able to reach similar findings.

1.1.4 Systematic Procedures

By following the evidence-based procedures outlined in this manual and in the referenced audit standards, audit risk can be minimized. The audit team must collect sufficient evidence to support their conclusions. Evidence may include things such as written notes, copies of records, and (if allowed) photographs. Evidence must be verifiable.

1.1.5 Open Communication

In order to truthfully and accurately report the audit activities, there must be open communication between the members of the audit team and the auditee. Diverging opinions should be resolved.

An audit should not be an ambush of the auditee. Openly share the audit criteria and checklists with the auditee in advance of the site visit. Communicate frequently during the audit work. In particular, share any potentially significant findings prior to the closing meeting.

1.2 Audit Limitations

There are inherent limitations to any audit. The audit team can assess only a sample of facilities and records. An audit is conducted during a finite period and with finite resources. Audit findings are based solely on evidence gathered at the time of the audit, and therefore the audit report may not identify all environmental concerns at the facility. By adhering to the audit principles identified in section 1.1, audit risk can be minimized.

2.0 Managing an audit program

As an organization, the users should develop an overall audit program. A flow chart showing the management of an audit program is presented in Figure 3.

Authority from top management of the users is required to establish the audit program. The Program Manager is responsible for identifying resource needs, and establishing, implementing, maintaining and improving the audit program.

Consideration should be given to conducting joint audits with other programs (e.g., health and safety). Combined audits minimize the disruption to facility business, and may reduce overlap between audits and programs.



Figure 3- Audit Program Process Flow (from ISO 19011:2002)

2.1 Audit Program Establishment

The establishment of an audit program should be based on the overall management priorities, regulatory requirements, customer requirements, and the needs of other interested parties. An overall plan should be prepared showing:

1. The scope, objective and duration of each audit to be conducted over a specified period.
2. The frequency that audits will be conducted.
3. The criteria for each audit.
4. Responsibilities for each audit, including selection of audit team.
5. Required resources, including personnel, time and equipment.
6. Audit procedures (may be from this manual, or adapted from this manual), including details of record keeping.

2.2 Audit Program Implementation

To implement the audit program, the audit coordinator must have the overall plan approved by senior management. The coordinator will then:

1. Communicate the plan to relevant parties.
2. Coordinate the scheduling of the audits identified in the plan.
3. Ensure that the Lead Auditor is assigned and audit team members are selected.
4. Provide necessary resources to the audit team.
5. Ensure that audits are completed as planned.
6. Review and retain audit reports and other records.
7. Communicate audit findings as appropriate to senior management or other similar facilities.
8. Maintain an overall database of audit follow up actions.

2.3 Monitoring and Review of Program

The overall implementation of the audit program should be reviewed at specified intervals to assess its effectiveness and to identify opportunities for improvements.

Things to consider:

- Were planned audits conducted?
- Are the audit checklists appropriate?
- Are other audit tools appropriate?
- What feedback has been received from auditees and auditors?
- Have audit findings been resolved?
- Have changing conditions resulted in a need for major changes to the program?

3.0 Audit Planning

Audit planning results in a written audit plan that can be shared between the audit client, audit team and auditee. **An example audit plan is contained in Appendix A.**

3.1 Define Audit Objectives, Scope and Criteria

The client (i.e., the corporate offices of the user) is responsible for identifying the objectives, scope and criteria of each audit.

1. The audit objectives are what is to be accomplished by the audit.
2. The scope covers the extent and boundaries of the audit (e.g., what facilities, activities and processes will be audited). The scope also includes the time period covered by the audit. Most often, the audit period is the time elapsed since the last audit. If no previous audit has been conducted, choose a period that provides representative records for a full business cycle (e.g., at least one year).
3. The criteria are the requirements against which the auditee will be judged. The document has three sets of audit checklists containing criteria identified as appropriate for current operations of PCJ. An additional checklist for ISO 14001:2004 has also been provided.
 - a. Seismic program criteria are contained in the checklist in Appendix B.
 - b. Refinery criteria are contained in the checklist in Appendix C.
 - c. Service station and storage criteria are contained in the checklist in Appendix D.
 - d. While not currently applicable, ISO 14001 requirements are provided in Appendix E for future reference.

3.2 Audit Scheduling

The audit should also be tentatively scheduled at this point so that the auditee and audit team members can block their calendars off, and guides (if necessary) can be identified. Ideally, the schedule should be set more than one month in advance. During scheduling, consideration should be given to providing preparation and wrap up time for the audit team, and also to avoiding undue business interruption for the auditee. If possible, schedule site visits at off-peak times so that workers can provide more time to the auditors. Avoid statutory holidays, busy vacation periods when key personnel may be away, and ending an audit on a Friday afternoon when personnel may be less likely to be receptive to audit findings.

3.3 Select the Audit Team

The first person appointed to the audit team should be the Lead Auditor.

The audit team should then be selected by the Lead Auditor (or with the Lead Auditor's agreement). Collectively, the team must have the knowledge, skills, attributes and experience necessary to meet the objectives of the audit. Figure 4 shows the elements of competence.

It should be confirmed that all auditors are committed to the audit project for the identified time period for the audit.

Auditors-in-training can participate in audits, but should complete their work under supervision.



Figure 4- Auditor Competence

3.4 Review Documents

Prior to conducting on-site activities, the audit team must gain an understanding of the activities and facilities of the auditee. This information may be gained by reviewing relevant environmental documents and plans for the company/facility (e.g., historical information, organizational charts, environmental reports, management system manuals). Information may be available from websites or from the auditee. The audit team must have an understanding of the size, nature and complexity of the company/facility in order to prepare an audit plan. Be sure to confirm whether all records/documents will be available on-site during the audit, or if the audit team may have to access records that are retained elsewhere (e.g., a central office rather than on site).

Hint: Use the pre-audit questionnaire in Appendix A to request comprehensive environmental documents and records prior to the audit.

3.5 Prepare an Audit Plan

Prepare a brief written audit plan using the example provided in Appendix A, or other similar layout. The audit plan contains information on the audit:

- objectives;
- scope;

- criteria and any reference documents (e.g. procedures of the user, ARPEL documents);
- audit team,
- audit schedule (dates and places where the on site audit activities will be conducted),
- contact personnel at the site;
- information on meetings with the auditee's management;
- audit logistics information (travel, on-site facilities such as cafeterias);
- safety requirements (personal protective equipment, training requirements);
- security details (if applicable), such as inaccessible areas of the site;
- auditor resource needs (e.g., internet access, access to site databases/IT systems, meeting room, telephone, photocopier, etc.);
- details on requirements for guides to direct the audit team;
- information relating to confidentiality; and
- proposed auditing procedures (e.g., will photos be taken?).

The plan should be reviewed and accepted by the audit client and the auditee prior to the audit. Any objections to the plan should be resolved before commencing the audit.

For management system audits such as ISO 14001 (if completed in future), a more detailed schedule should be prepared to show that all elements of the system are being audited. An example schedule is provided in Appendix A.

Hint: Use the audit plan template in Appendix A as a model.

3.6 Prepare Work Documents and Tools

The Lead Auditor is responsible for ensuring that audit work has been assigned to appropriate members of the audit team, and that required documents and audit tools are available.

The audit team should use an audit protocol (checklist) that reflects the audit scope, criteria, and environmental profile of the company/facility. While checklists for standard PCJ activities have been prepared and are provided in appendices to this document, they may quickly become outdated due to changes in the facility, or changes to legislation or guidelines. Review the appropriate checklist prior to use, and edit as necessary, deleting or adding new requirements.

The checklists have been designed to:

- be arranged logically by topic;
- organized to maximize efficiency of the audit; and
- provide references for the requirements.

Another audit tool that should be distributed for use by the audit team is the working paper, a ruled paper that can be used to record audit evidence. See Appendix A.

Hint: Each auditor should have a binder containing:

- the audit plan
- the audit checklist
- audit working papers
- reference documents (if applicable)
- post-it notes or flags

3.7 Audit Team Meeting

If the audit team is not used to working together, it may be a good idea to have a team meeting in advance of the audit to ensure that all team members are aware of the audit plan and their responsibilities.

4.0 Audit Execution

4.1 Opening Meeting

A brief opening meeting should be held at the start of on-site audit activities. It should be attended by the audit team and key members of the auditee staff. This meeting generally takes less than 20 minutes and no minutes are kept. The agenda of the opening meeting should include:

1. Introduction of the audit team and key members of the auditee team.
2. A review of safety requirements and procedures, including evacuation points, alarms, etc.
3. Confirmation of the audit plan and all its contents (as noted above), including whether photos can be taken.
4. A short description of how audit activities will be undertaken.
5. Confirmation of communication channels.
6. Confirmation that necessary audit resources and guides are available.
7. Confirmation of the confidentiality of the audit process.
8. An opportunity for the auditee to ask questions.

Use the Meeting Record Form in Appendix A to record attendance.

4.2 Collecting Evidence

Information relevant to the audit objectives should be collected during the on-site activities. Keep an on-going list of potential issues. Audit evidence must be verifiable, and should be recorded. Since evidence is collected based on a sampling of data, there is an element of uncertainty in the findings. Sampling should continue until a conclusion can be reached regarding compliance with a requirement (e.g., that a clear pattern of compliance or non-compliance has been confirmed).

Audit evidence is gathered only on site. Do not contact outside agencies or regulators to request information on the site.

Methods for collecting evidence include:

- a. observation of activities (the strongest evidence);
- b. review of document and records; and
- c. interviews (the weakest evidence).

Make note of positive initiatives and results, not only negative evidence.

4.2.1 Observation

On site observation should include a facility tour. A tour is generally the first activity undertaken following the opening meeting. If possible, the entire audit team should tour the facility together with a knowledgeable guide prior to splitting up to complete the rest of the audit. Observations of potential concerns or topics for further investigation should be recorded on working papers.

If available, use a site plan to record information during tours. Ask questions, take notes and (if allowed) photographs during the tour. Take the audit checklist on all tours, answering questions as you go.

Look for obvious areas of concern such as spills, distressed vegetation, deteriorating equipment or berms, oily sheens on water, hydrocarbon odours, overflowing waste containers.

4.2.2 Document and Records Review

Document and records review ideally begins prior to the on-site activities. Documents and records that may be relevant are listed in the pre-audit questionnaire. They include: policies, procedures, licences, approvals, specifications, drawings, contracts, invoices, meeting minutes, audit reports, monitoring records, laboratory analyses, etc. Documents and records may be in paper or electronic form. They provide factual information about environmental compliance. Where appropriate, photocopy or print records as audit evidence.

Regulatory reporting is a critical issue. During the document and records review, be sure to check all reports submitted to regulatory agencies against the requirements for reporting. Check for: content, completeness, date of submission, any exceedences noted.

Review reports on any inspections completed by regulatory personnel. Review documented follow up to those inspections.

Review correspondence to and/or from regulators.

Documentation Review Hints:

- Request documents and records relating to potential issues identified during site tours or in interviews
- Look for **consistent** record keeping (e.g., daily or weekly checks).
- Are forms completed fully?
- Are there gaps in the records?
- Can records be traced back to the person who completed them?
- Request access to site electronic files

4.2.3 Interviews

Interviews are a very important source of information during an audit, but they are also the weakest form of evidence. All interview information should be corroborated. Depending on the seniority of the interviewee and the nature of work, interviews may be arranged in advance, or may be opportunistic. Interviews should include workers at all levels within the organization. Do not rely on information solely from senior management. Front-line workers must be interviewed. If possible, interview short-service workers or contractors on site to assess their understanding of requirements.

Except for the most senior employees interviewed, avoid setting rigid interview schedules. It is difficult to estimate the duration of audit activities.

Interview Hints:

- The interviewee may be nervous - put them at ease through your tone and mannerisms
- Introduce yourself
- Explain the purpose and objectives of the audit
- The first question should be a general question getting the person to describe their work
- Avoid leading questions - wherever possible ask open ended questions rather than questions that have a yes/no answer
- End by thanking the interviewee

4.3 Communication During the Audit

The audit team should meet regularly during the audit to exchange information, assess progress, and (if necessary) revise the audit plan or re-assign audit activities. In longer or more complex audits with multiple auditors, this communication may take place in formal daily meetings.

The Lead Auditor should keep the auditee informed regarding the progress of the audit and any significant findings. Report any difficulties so that they can be resolved and the audit completed successfully. For example, if records cannot be located, give the auditee a chance to find them elsewhere. If it becomes apparent that the audit objectives will not be met in the time allowed, notify the auditee.

Auditors may note findings outside of the audit scope (e.g., safety hazards may be noted during an environmental audit). Report these findings to the auditee as appropriate.

Important!!

Notify the auditee quickly of any conditions identified during the audit that need immediate attention or represent a serious risk. Do not wait until the closing meeting or end of the business day.

4.4 Generating Audit Findings

The audit team should confer at the end of the audit to identify findings and conclusions. Audit evidence is evaluated against the audit criteria to generate audit findings. Audit findings can indicate either compliance or non-compliance with a requirement. If identified as one of the audit objectives, audit findings may identify areas for improvement (where non-compliance is possible but was not observed). Findings may be ranked for severity.

An overview of the process to collect audit evidence is shown in Figure 5.

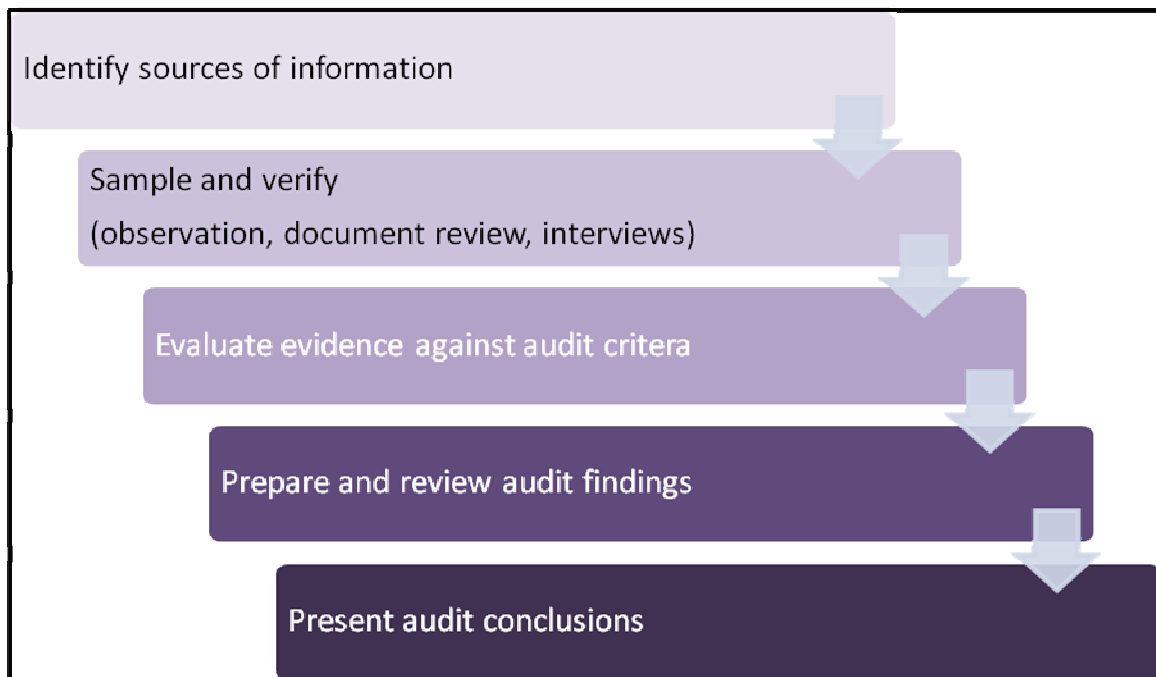


Figure 5- Process Used to Reach Audit Conclusions

4.5 Closing Meeting

A closing meeting should be held at the end of the audit. Participants in the meeting should include the audit team, the auditee, and may include the audit client. Most often, it is held at the end of on-site audit activities, but occasionally it is held elsewhere (e.g., a head office). This meeting is generally longer than the opening meeting. It may be a formal meeting in which minutes are kept. Findings are not generally provided in writing (due to the presentation of results immediately after conclusions are formed). This meeting presents an opportunity for the auditee to identify diverging opinions with the auditors, and to indicate if they believe they have additional evidence that should be reviewed.

The agenda of the closing meeting should include:

1. Introduction of the audit team if there are people in attendance who were not at the opening meeting. Review audit roles.
2. Thank the auditee, acknowledging particularly helpful people by name.
3. Describe audit risk.
4. Review whether the audit plan was followed successfully, or note any changes.

5. Present preliminary audit findings and conclusions, including positives as well as non-compliance issues.
6. Discuss any diverging opinions between the auditee and the audit team.
7. Describe the formal reporting process.

Use the Meeting Record Form in Appendix A to record attendance.

5.0 Audit Reporting

The Lead Auditor is accountable for preparation of the audit report. An auditor may write the report under their supervision. The audit report should provide a concise, accurate and complete record of the audit. It should include:

- the objectives, scope and time period of the audit;
- a summary of the audit processes;
- a description of audit risk/limitations and any obstacles that were encountered that could increase audit risk;
- identification of the audit client, audit team, and auditee;
- a description of the facilities audited;
- reference to the audit criteria; and,
- the audit findings and conclusions, including any unresolved issues between the audit team and the auditee.

The report may also include follow up findings of past audits.

A copy of the audit plan should be appended.

Audit reports are generally exception based (i.e., only findings are presented). Auditors should be given the opportunity to review the report. The report should be dated and signed by the author and reviewer, one of whom must be the Lead Auditor. The reviewer should ensure that the audit:

1. Met the audit objectives.
2. Contains valid and accurate results (i.e., that the findings are based in fact and legislation has been appropriately interpreted).

An advance draft of the audit report is generally provided to the auditee as a last chance to review the findings and identify errors or omissions by the audit team. Once the audit report has been provided by the Lead Auditor to the client, further distribution of the report is at the client's discretion. The audit team members must respect the confidentiality of the report.

Hint: Use the report template provided in Appendix A.

6.0 Audit follow up

The conclusions of the audit may indicate the need for corrective, preventive, or improvement actions. It is the responsibility of the auditee to identify necessary actions and implement planned changes. The audit team is generally not involved in this process.

Follow up plans generally document the audit finding, proposed actions, responsible person, budget requirements, a target date for completion, and status of the action. An example audit follow up plan is contained in Appendix A. This action plan may be reviewed as a part of subsequent audits.

7.0 References

- Canadian Standards Association, 2003. “Environmental Compliance Auditing”, CSA Standard Z773-03.
- International Organization for Standardization, 2002. “Guidelines for quality and/or environmental management systems auditing”, ISO Standard 19011:2002.

APPENDIX A - AUDIT TOOLS

This appendix contains audit tools that were prepared to be used for audits of PCJ's refinery, service station/storage facilities, and offshore seismic operations. However, they can be used by other oil and gas companies although they should be adapted to their specific –local- regulatory framework and/or corporate procedures.

Environmental Audit

Audit Plan – (insert Facility Name)

Time: Time Place: Place

Audit Objectives:

- (edit the Audit Objectives as Appropriate)
- Determine the facility's status of compliance with environmental legislation and guidelines;
- Assist operations in the evaluation and mitigation of environmental [and compliance] risks at through site inspections, communication of findings and recommendations, determination of facility action plans, and documentation of mitigation actions
- Identify areas of potential environmental risk; situations that could be improved by adoption of industry best practices; and positive practices that may be used as learning tools for other PCJ operations.

Scope:

(Describe)

Criteria:

Environmental legislation pertinent to the facilities, including acts and regulations administered by (provide Department or Group). Also industry guidelines and best management practices from ARPEL and PCJ policies and procedures.

PCJ Audit Program Manager:

Name and Contact Information

Audit Team:

Lead Auditor: Name and Contact Information

Auditors: Name and Contact Information

Facility Contacts:

Name and Contact Information

Personal Protective Equipment Required:

(List Requirements)

Other Logistical Requirements

(List any other audit requirements, such as a need for security clearance, interview appointments with personnel, or provision of guides on site.)

Proposed Schedule:

Activity	(i) Time	(ii) Location
1) Safety Orientation (if required)	Time	Location
2) Opening Meeting	Time	Location
3) Audit Activities	Time	Location
4) Closing meeting	Time	Location

Protocol:

Environmental compliance protocol supplied by PCJ.

Auditing Procedures:

The opening meeting will include an overview of the audit plan, a review of any logistical restrictions and the anticipated schedule for getting around to all the facilities. The auditing procedures will consist of interviews, on-site observation and reviews of relevant procedures and records.

Audit Duration:

It is estimated that the audit will take (insert Number of Days) days to complete.

Closing Meeting and Audit Report:

The closing meeting is scheduled for (insert Time) (time to be confirmed) at which time the audit team will review its findings. A draft final audit report will be completed by (insert Date) for circulation and comment. The final report will be issued within two weeks following the receipt of all comments.

PRE-AUDIT QUESTIONNAIRE ENVIRONMENTAL AUDIT

This Pre-Audit Questionnaire is intended to provide facility information prior to an on-site environmental and/or health and safety audit. Please provide a response to all questions, other than those already marked as “not applicable”. A completed questionnaire can reduce the time spent at facilities and result in an efficient, more comprehensive audit. The information you provide here should be concise, yet complete.

Please return the completed form to: **PROVIDE NAME AND CONTACT INFO**

PART 1 – GENERAL INFORMATION

Facility Information

Person(s) Completing Questionnaire:			
Position/Title:			
Facility Name:			
Street Address:			
City, Province:			
Facility Telephone:			
Facility Contact(s):			
Title(s):			
Telephone:			
Facsimile:			
E-mail:			
Personal Protective Equipment			
Hard Hats	<input type="checkbox"/>	Hearing Protection	<input type="checkbox"/>
Safety Glasses (w/ side shields)	<input type="checkbox"/>	Steel Toed Boots	<input type="checkbox"/>
Other:			
Special Visitor Requirements			
Training:			
Attire:			

Audit Logistics

Audit Scheduling			
Activity	Day	Date	Time
Conference Call/Meeting			
Arrival at Facility:			
Opening Meeting:			
Daily Meeting(s):			
Pre-Closing Meeting:			
Closing Meeting:			

If available, please provide audit team with office space (meeting room preferred) and telephone line.
 If required to view environmental records, computer access should also be provided.
 This should be close to environmental contact work area.

General / Management

No.	i) Applicability Questions	Yes	No	NA
1.	Provide copies of all environmental licenses, permits, approvals and exemptions held by the facility.			
2.	List the natural resources that are produced/handled (e.g., sweet crude, sour crude, sweet natural gas, sour natural gas, condensate, etc.):			
3.	Do special arrangements need to be made to visit or inspect all of the facilities associated with this site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Attach a list of all hazardous materials used at the site, if available.			
5.	Has an EHS audit, either internal or external, been conducted at the site within the last 3 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Attach a map showing the locations of the main operational facilities and plant boundaries.			
7.	Attach a site plan with all site features identified.			
8.	Is aerial photography available for the site? If yes, have available on site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Does the site have a filing system and index for EHS files? If yes, have available on site during the audit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Are there any current administrative/judicial orders, pending or threatened litigation, unresolved allegations, citations, or notices of violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART 2 – QUESTIONNAIRE

Waste Management

No.	Applicability Questions	Yes	No	NA
1.	Does the facility generate any of the following wastes:			
	a. Hazardous Wastes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b. Industrial (Non-Hazardous) Wastes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	c. Medical (Pathogenic) Wastes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	d. Used Oil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	e. Asbestos Wastes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	f. General Trash?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	g. Recyclables?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	h. Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	What is the hazardous waste generator identification number, if applicable? _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Are there specific hazardous waste storage or accumulation areas at the site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Has a drum management plan been developed for the facility? If available, attach a copy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Is the site a permitted treatment, storage and disposal facility? If yes, please provide copy of applicable permit(s).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Does the facility operate (or participate in the operation of) any waste treatment or disposal sites (on- or off-site)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Does the facility have an emergency response plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Are there any waste minimizations programs at the facility?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Does the Facility produce used oil? If so, how many litres per month?			
10.	What is the method of disposal or recycling of used?			
11.	Has the facility been the subject of a government inspection in the past?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Has the facility received any "Orders" for any alleged violations of federal, provincial, or local waste management law or regulation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Are there disposal wells on site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Water Pollution Control

No.	Applicability Questions	Yes	No	NA
1.	Are any of the following waters/wastewaters generated at the facility? Check all that apply.			
	a. Process water (aka industrial wastewater)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b. Non-contact water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	c. Sanitary wastewater (i.e., sewage)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	d. Stormwater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Are there any discharges to surface water? If yes, provide information on outfalls and receiving waters.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Are there groundwater supply wells on site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Are their groundwater monitoring wells (aka piezometers) on site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Does the site's discharge permit(s) contain "special conditions" (i.e., priority pollutant analysis, biomonitoring, etc.)? If so, please list. _____ _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Does the facility discharge wastewater to a storm sewer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Is the facility required to submit a storm water permit application? If yes, what is the status of the permitting process?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Is an analytical laboratory used for wastewater sampling and analyses (i.e., in-house laboratory or outside laboratory)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Has the facility been the subject of a government inspection where inspection of the water discharge was conducted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Has the facility received any notices of violation for any alleged violations of federal, provincial, or local water pollution control legislation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Drinking Water

No.	Applicability Question	Yes	No	NA
1.	What is the source of the facility's potable water?			
2.	Is the potable water available at the facility treated and distributed by the facility?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Does the facility monitor on-site drinking water sources?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Air Emissions

No.	Applicability Question	Yes	No	NA
1.	Is the facility required to register air emission sources?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Does the facility conduct any air emission monitoring?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Has the facility emissions resulted in complaints from the general public as a result of odours, fugitive dusts, other? Please specify if yes:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Does the facility utilize air pollution control equipment? If yes, have information available on site during the audit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Is equipment used containing ozone-depleting substances (ODS)? If yes, which type of ODS (e.g., Halons, CFC, etc.):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Land Use

No.	Applicability Questions	Yes	No	NA
1.	Are threatened and/or endangered species known to inhabit areas near the facility?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Are any portions of the land near ecological reserves, protected natural areas or parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Storage Tanks

No.	Applicability Question	Yes	No	NA
1.	Are there any underground storage tanks at the facility? Have any been removed? If so, provide an inventory showing tank sizes and contents.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Are there any above ground storage tanks in use? If so, provide an inventory showing tank sizes and contents.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Does the facility dispense fuel to motor vehicles?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Chemical Management

No.	Applicability Questions	Yes	No	NA
1.	Does the facility use or store any materials classified as: Toxic? (including pesticides/herbicides)	<input type="checkbox"/>	<input type="checkbox"/>	X
2.	Flammable/Combustible?	<input type="checkbox"/>	<input type="checkbox"/>	X
3.	Corrosive?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Reactive?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Are PCBs or PCB contaminated oils in use or stored in the facility?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Transformers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.	Capacitors?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Electromagnets?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Hydraulic Systems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Does the facility have a PCB storage area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Does the facility maintain information about past PCB waste disposal operations or practices?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Are any asbestos containing materials present on-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	If yes, is there an asbestos program in place for the facility?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	Has any asbestos containing material been removed in the last year?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	Does the facility use any pesticides, fungicides or rodenticides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	Are there LPG storage facilities on site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Records Request List

Please provide the following information with the completed pre-audit questionnaire.

- Facility plot plan or map
- Facility organization chart
- Description of the operations
- Listing of current permits and applications
- Recent regulatory agency inspection/enforcement correspondence, if any
- Recent internal and external audit reports and action plans
- Facility environmental policies, procedures, and guidelines, if applicable
- Chemical inventory

The following is a list of files, records and documents which may be assessed during the facility audit. Please indicate the personnel responsible for these topic areas, whether the following items are available and where they can be located. Please ensure that these files are available for review during the audit. We appreciate your taking time to locate these items.

File/Program List	File Location
General / Management Personnel Responsible:	
1) Organizational charts	
2) Job descriptions	
3) Formalized goals and objectives	
4) Previous audit reports	
5) Training Records	
6) Release/Incident Reporting Procedures and records	
7) Process Flow Diagrams, Plot Plans, Topographic Maps, Aerial Photography	

File/Program List	File Location
8) Agency inspections, including violations, responses	
Solid / Hazardous Waste Management Personnel Responsible:	
1) Waste Inventories	
2) Waste Management Plan(s)	
3) Hazardous waste manifests and logs (2 years of manifests)	
4) List of approved disposers - Hazardous & Non Hazardous	
5) Permits and reports for on-site treatment/disposal of waste, if applicable	
6) Non hazardous waste records	
7) On-site storage area records	

File/Program List	File Location
Water Pollution Control Personnel Responsible:	
1) Wastewater plans, permits or authorizations / approvals	
2) Wastewater collection and treatment systems, including operation and maintenance activities	
3) Industrial, sanitary and storm sewer plans/drawings, test reports, etc.	
4) Wastewater monitoring/sampling data and reports	
5) Laboratory analytical reports	
6) Groundwater monitoring reports	
Drinking Water Personnel Responsible:	
1) Drinking water system and/or well location	
2) Inventory of drinking water wells on-site	
3) Well information (driller's logs)	
5) Analytical test results	
Air Emissions Personnel Responsible:	
1) Certificates of Approval	
2) Inventory of air emission sources and contaminants	
3) Emission monitoring data and reports	
4) Dispersion modelling reports and follow up	

File/Program List	File Location
5) Noise monitoring data and reports	

File/Program List	File Location/ Room #
<u>Storage Tanks</u> Personnel Responsible:	
1) Inventory of tanks (above and underground) and contents	
2) Notifications or registrations of tanks with regulatory agencies	
3) Remediation projects – correspondence and reports	
4) Spill history	
5) Records on tank system testing (integrity test, etc.) and volume calculations for secondary containment	
<u>Chemical Management</u> Personnel Responsible:	
1) Chemical Inventory	
2) Material Safety Data Sheets	
3) List of Hazardous Material Storage Facilities	
4) List of Radioactive Equipment and associated licenses	
5) PCB Inventories	
6) Transportation of Dangerous Goods – Shipping Documents	
7) List of pesticides, herbicides, fungicides used per area	

AUDIT MEETING RECORD

Auditee: _____

Project #: _____

Date & Location of Opening Meeting: _____

Date & Location of Closing Meeting: _____

Name	Position/Company	Opening Meeting	Closing Meeting

**ENVIRONMENTAL AUDIT
WORKING PAPER**

Page _____ of _____

Business Unit / Company Division _____		Auditor: _____
Auditee: _____		Date : _____ / _____ / _____ (Y/M/D)
Observations, Data and Analysis		Cross-Reference to Checklist Item
1		
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Attachments: ___ Y (list above) ___ N

EMS - Audit Plan for ISO 14001:2004

Auditee: Contact: Manual: List most recent EMS Manual Date Criteria: ISO 14001:2004 Audit Date(s):	TEAM					
	1	2	3	4	5	6
	A U D I T O R 1	A U D I T O R 2				

Reference

1.1	Scope & Use Of Certificates & Logos	NC					
4.1	General Requirements	C	X				
4.2	Environmental Policy	C	X				
4.3.1	Environmental Aspects	C	X				
4.3.2	Legal & Other Requirements	C	X				
4.3.3	Objectives & Targets	C		X			
4.4.1	Structure and Responsibility	C		X			
4.4.2	Training Awareness and Competence	C		X			
4.4.3	Communication	C		X			
4.4.4	Environmental Management System Documentation	C	X				
4.4.5	Document Control	C	X				
4.4.6	Operational Control	C		X			
4.4.7	Emergency Preparedness and Response	C		X			
4.5.1	Monitoring and Measurement	C		X			
4.5.2	Evaluation of Compliance		X				
4.5.3	Nonconformance and Corrective and Preventive Action	C		X			
4.5.4	Control of Records	C		X			
4.5.5	Internal Audit	C	X				
4.6	Management Review	C	X				

*NC = Not Covered, C=covered

AUDIT PLAN - DAILY PROGRAM SCHEDULE

AUDITEE :	Project :
CRITERIA : ISO 14001:2004	
DATE(S) :	

Aspects: * All

DAY 1			
	AUDITOR #1 (LIST NAME)		AUDITOR #2 (LIST NAME)
8:00	Audit Team Briefing/Opening Meeting	8:00	Audit Team Briefing/Opening Meeting
4.1	General Requirements	4.3.3	Objectives, Targets and Program
4.2	Environmental Policy	4.4.1	Resources, roles, responsibility and authority
4.3.1	Environmental Aspects	4.4.2	Training Awareness and Competence
4.3.2	Legal & Other Requirements	4.4.3	Communication
4.4.4	Documentation	4.4.6	Operational Control
DAY 1			
4.4.5	Control of Documents	4.4.7	Emergency Preparedness and Response
4.5.2	Evaluation of Compliance	4.5.1	Monitoring and Measurement
4.5.5	Internal Audit	4.5.3	Nonconformance and Corrective & Preventive Action
4.6	Management Review	4.5.4	Control of Records
3:00	Closing meeting		

*Each team member will also cover areas beyond those of the of the significant aspects, as required by each element

Example Audit Follow Up Plan

Audit Finding	Priority	Follow up Action	Responsible	Budget	Target Date	Status
Liner for berm around 15,000 L aboveground storage tank at facility is torn	Medium	Replace liner during facility turnaround	Robert Smith	\$30,000	June 30, 2009	Contracting in progress as of November 2009
MSDS out of date at repair shop	Low	Obtain current MSDS	Jane Brown	\$50	December 31, 2008	Assigned to environmental intern Nov. 1, 2009

Audit Report

(insert type of audit)
– (insert business unit)
(insert audit dates)

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Findings	18-A
Findings Summary	19-A

Appendices

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Appendix B - Audit Plan	

Audit Plan The Audit Plan dated (insert audit plan date) was prepared by the lead auditor and forwarded to (insert business unit) prior to audit team arrival on site to conduct the audit. The audit (insert "was" or "was not") performed according to the Audit Plan included in the Audit Plan. (If "was not" then leave in the following statement. If "was" then delete the following statement and Appendix B). A revised schedule indicating the areas covered by the audit is included as **Appendix B**.

Audit Team Lead Auditor –
(insert name and/or designations)

Auditor(s) –
(insert name and/or designations)

Audit Scope and Objectives (insert description)

Findings Audit findings are based on analysis of the information obtained during the course of the audit. Detailed audit findings are included in **Appendix A**.

Audit findings have been reviewed with the auditee's representative in order to obtain acknowledgement of their factual basis.

Findings Summary

Findings are classified as posing high, medium or low potential environmental risk.

Concern / Legal Reference	Low	Medium	High
insert area of concern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
insert area of concern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Previous Audit Findings

(insert status of previous audit findings)

Audit Confidentiality

The audit was prepared for the exclusive use of the auditee. The results of the audit will be considered confidential, and will not be released to any third party without the consent of the auditee.

Audit Limitations

This audit uses a sampling approach to selecting the facilities and employees to audit based on the business unit's operations, procedures and processes related to their significant environmental aspects and/or legal and other environmental requirements. Findings and conclusions are based solely on the information gathered and reviewed during the audit. Non-compliances may be present within and beyond the scope of the audit.

Audit Report Preparation

(insert lead auditor name and/or designations)
 (insert lead auditor phone number)
 (insert lead auditor email)
 Date: (insert date of report preparation)

 Signature

Appendix A

Location Facility, Building or Address		Name of Auditor(s) Name of Auditor(s)
Auditor's Description of Finding		
(b) Finding # YYMMDD-01	Audit Criteria: (Regulatory Citation or Auditee manual/procedure) Legislated Reference or Guideline	
Priority Ranking: High/Medium/Low (c)		
Condition Expected: Outline the expectations described in the standard or legislation.		
Condition Found: Provide a description of finding and state environmental risk or impact. Include specific area if applicable. Insert photo if applicable.		
Recommendation: Provide recommendations for preventive and corrective action.		

Insert Audit Plan

APPENDIX B – OFFSHORE SEISMIC OPERATIONS

Seismic Protocol

This appendix contains audit checklists that were prepared to be used for audits of PCJ's offshore seismic operations. However, this checklist can be used by other oil and gas companies although they should be adapted to their specific –local- regulatory framework and/or corporate procedures.

Checklist for Conducting Environmental Audits: Offshore Seismic Operations

Prepared for:
Petroleum Corporation of Jamaica

The user is encouraged to have at hand the ARPEL Guideline #14 "Guidelines for Conducting Environmental Audits for the Petroleum Industry Operations" (1997), found at
http://portal.arpel.org/apps%5Carpel%5Cml_lib_nueva2.nsf/0/0EF86569B866C51003257226006D3465?opendocument&FolderID=4456269EDB93459803257213005F63F0

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1.0 PROGRAM PLANNING

1.1 Regulatory Authority

Requirement				
Required licenses, permits and letters of authority have been obtained for the planning, design, construction and operation of off shore seismic operations facility. Any special conditions or restrictions are reviewed and enforced.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Required permits, licenses and regulatory authorizations for the seismic operation are available for review.				
Conditions, restrictions and requirements of permits and licenses have been included in program design and operation.				
A detailed schedule of seismic operations is documented and was submitted to The Marine Authority of Jamaica, The Ministry of Agriculture Fisheries Division, The National Environment and Planning Agency, the Port Authority of Jamaica, and the Jamaica Defence Coast Guard, 5 or more days before the survey started.				
Facility operators are aware of the conditions and restrictions, and environmental concerns for the seismic operations.				
Guidance				
<p>Refer to: ARPEL Guideline #14 SEIS 1.0 Regulatory Environmental Authorization; Fisheries and Oceans Canada, 2007. Mitigation of Seismic Noise in the marine environment, Statement of Canadian Practice, found at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/im-gi/seismic-sismique/statement-enonce_e.asp</p> <p>Check office and site records for permits and regulatory authorizations, such as NEPA letter of approval with conditions. Check that permits and licenses are available from seismic operations supervisory personnel. Check for documentation and reports that address limitations or conditions required by the permits, such as: for Protected and Conservation Areas, and existing pipelines. Compare maps showing locations of the lines and anchoring logs with permit restrictions.</p> <p>Interview seismic personnel regarding specific permit requirements, the documentation, training and reporting of these permit requirements. Supervisory personnel are aware of any restrictions and have provided this information to the contractor. Any license requirements or restrictions are enforced with the contractor and personnel. Confirm that regulators have been contacted about the project prior to the operations start.</p>				

1.2 Environmental Planning

Requirement				
Planning of exploration operations shall be undertaken in a manner that will anticipate problems and minimize the effects of the operations on the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Environmental concerns were incorporated during the planning stage of the operation. For example: <ul style="list-style-type: none"> • avoiding recognized habitats for marine mammals (e.g. feeding, breeding, calving and spawning areas), • minimizing acoustic disturbance to cetaceans • minimizing effects of energy sources, recording cables and anchoring on coral reefs 				
An Environmental Protection Procedure for Marine Operations document has been prepared and submitted to NEPA. Considerations of this document include, but are not limited to: <ul style="list-style-type: none"> • establishment of buffer zones from shallow reefs, shallow shoals, active fishing areas, special communities and coral islands; • safety zones are established from the center of the seismic source or arrays; • ongoing visual monitoring of the safety zone for specified times before survey start up; • delay procedures when sea turtles, whales or dolphins are identified in the safety zone; • procedures relating to ramp-up or soft-start of seismic array; and • inclusion of passive acoustic monitoring before start up or recommencing of seismic activity. 				
The Environmental Protection Procedure includes provision for a scouting vessel and a representative of the local fishing community during all seismic activities.				
Seismic surveys have been planned to avoid sensitive times of the year.				
In near-shore areas, an assessment of the environmental resources in undertaken and is documented.				
In near-shore areas, attempts have been made to schedule operations to avoid the				

time periods of high commercial/subsistence fishing and significant recreational activities, and have been documented.				
Environmental planning limits or avoids activity or establishment of landmarks on the foreshore and the floor of the sea.				
Plans exist to limit interruption of commercial or subsistence fishing activities.				
Training of crew in environmental protection procedures is carried out and documented.				
Guidance				
Refer to: ARPEL Guideline #14 reference: SEIS 2.0 Environmental Planning; Fisheries and Oceans Canada, 2007. Mitigation of Seismic Noise in the marine environment, Statement of Canadian Practice, found at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/im-gi/seismic-sismique/statement-enonce_e.asp				
Geophysical programs are generally localized and of limited duration. Operations in shallow/near-shore waters tend to have greater potential for environmental impacts. Verify that local authorities, experts and/or agencies were contacted for information early in the planning process.				
Existing commercial and recreational activities are generally compatible with geophysical operations.				

1.3 Stakeholder Consultation

Requirement				
During seismic operations, stakeholders such as other marine users, local communities and coastal business owners shall be consulted as appropriate.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Consultation and liaison has been undertaken with the local communities/groups, the fishing industry, environmental groups and other external parties.				
Notification of detailed schedule of seismic activities is provided to relevant government agencies at least 5 days prior to survey commencement.				
Notification of work areas and proposed survey lines is provided to all marine interests (government authorities and communities) in the local area at least one week before survey commencement. Methods include notifying government agencies, signs along coastal roads, newspaper and electronic media notices.				
Issues raised during community consultation have been documented.				
Where possible, issue resolution is incorporated into planning and operations, or is otherwise resolved. Examples include a conflict resolution plan, a compensation plan, and vessel approach plan.				
If navigation aids have to be placed onshore to support marine seismic vessels, local authorities are consulted in advance.				

Guidance

Refer to: ARPEL Guideline #14 SEIS 3.0 Consultation and Liaison; Fisheries and Oceans Canada, 2007.
Mitigation of Seismic Noise in the marine environment, Statement of Canadian Practice, found at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/im-gi/seismic-sismique/statement-enonce_e.asp

2.0 SEISMIC PROGRAM

2.1 Seismic Surveys

Requirement Seismic surveys shall be undertaken so that disturbance to the environment is minimized.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Where explosives are used, mitigation measures (such as progressive power build-up in energy sources) are in place to protect fish, marine mammals and coral reefs and any residual impacts on these resources.				
The lowest possible energy levels are used to achieve the objectives of the survey.				
Methods to reduce and/or baffle unnecessary high frequency noise produced by air guns or other acoustic energy sources should be used, where possible				
A log book or other method of systematically recording environmental observations is used by the personnel conducting the survey.				
Personnel are trained to take appropriate action if marine mammals move into the area of operation. Seismic start-up should begin at least 500 metres away.				
If sensitive species are anticipated in the area, their presence is monitored before the onset of noise creating activities, and throughout the seismic program. In areas where significant impacts to sensitive species are anticipated, experienced observers are used;				
In the event of equipment lost overboard, reasonable efforts are made to retrieve equipment as soon as possible after the loss occurs. The loss is reported to the appropriate regulatory agency.				
Weekly reports to government agencies include: <ul style="list-style-type: none"> • Locations of lines surveyed to date; • Observations reports of wildlife; • Log of environmental incidents and actions taken; • Log of disposal of waste or 				

<ul style="list-style-type: none"> other material; • Log of incidence affecting fisheries and actions taken; • Loss of equipment; and • Fuel, oil and cable fluid spills and actions taken. 				
A final report is submitted to the appropriate government agency within 2 weeks of completion of the survey.				
Guidance				
<p>Refer to: ARPEL Guideline #14 SEIS 4.0 Seismic Surveys International Finance Corporation Environmental, Health and Safety Guidelines for Offshore Oil and Gas Development, April 2007. available at: http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_OffshoreOilandGas/\$FILE/Final+-+Offshore+Oil+and+Gas+Development.pdf</p> <p>Fisheries and Oceans Canada, 2007. Mitigation of Seismic Noise in the marine environment, Statement of Canadian Practice, found at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/im-gi/seismic-sismique/statement-enonce_e.asp</p> <p>Explosives as an energy source are likely to have more impacts than air gun sources.</p>				

2.2 Protection of Intertidal Areas

Requirement				
Where seismic operations are conducted in intertidal areas special precautions shall be taken as dictated by the sensitivity of the area.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Appropriate precautions are taken to protect the integrity of the intertidal areas.				
Use of drilling mud on the foreshore for drilling shot holes for explosive charges, has been discussed with, and approved by, relevant authorities.				
Inspection programs are in place to ensure that no debris is left on the shore.				
Proper authorities are notified if a suspected archaeological site is encountered.				
Guidance				
<p>Refer to: ARPEL Guideline #14 SEIS 5.0 Intertidal Areas; Fisheries and Oceans Canada, 2007. Mitigation of Seismic Noise in the marine environment, Statement of Canadian Practice, found at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/im-gi/seismic-sismique/statement-enonce_e.asp</p> <p>Tidal marshes, mud flats and mangroves can be damaged through changes in salinity, vegetation and erosion resulting from geophysical operations.</p> <p>Appropriate precautions include:</p> <ul style="list-style-type: none"> • did lines follow waterways (tidal channels) or bypass stands of vegetation, • waterborne transportation used instead of creating new land access, • a barge mounted base and quarters is used in preference to shore-based facilities, • speed limits are in effect for watercraft to reduce erosion potential of navigable channels, care was taken when using vibroseis vehicles, water tenders and other equipment to prevent undue interference with habitats, amenities and commercial interests. 				

2.3 Vessel Operations

Requirement				
The survey vessel and auxiliary craft shall operate according to local regulations and in a manner that minimizes impacts on the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Where vessels are operating in near-shore or inter-tidal areas, operating procedures include instructions respecting speed, routes, etc., that are designed to reduce the potential for erosion, contact with marine mammals and commercial or subsistence fisheries.				
Vessels used in seismic operation comply with all regulatory and international convention requirements for safety and pollution response and mitigation as stipulated by the Maritime Authority of Jamaica.				
Guidance				
Refer to: ARPEL Guideline #14 SEIS 6.0 Vessel Operations; Fisheries and Oceans Canada, 2007. Mitigation of Seismic Noise in the marine environment, Statement of Canadian Practice, found at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/im-gi/seismic-sismique/statement-enonce_e.asp				
Inspect vessels and, if possible, observe routine operations to determine if care has been taken to minimize the possibility of spills and other unacceptable discharges of fuels, oils and solvents.				

3.0 SPILL PREVENTION AND RESPONSE

3.1 Spill Prevention

Requirement Measures shall be taken to prevent the occurrence of chronic and accidental spills.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A spill prevention plan is documented.				
Vessel and survey personnel are trained in spill prevention.				
Procedures for refuelling operations are posted and communicated.				
Emergency drills have been completed and records retained.				
Guidance				
Refer to: ARPEL Guideline #14 SEIS 7.0 Spill Prevention; Fisheries and Oceans Canada, 2007. Mitigation of Seismic Noise in the marine environment, Statement of Canadian Practice, found at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/im-gi/seismic-sismique/statement-enonce_e.asp				
Verify that drip trays or other containment system is placed under equipment containing fuel and/or lubricating oil and cable oil and that the fluids collected are directed to sumps or separators where they are collected for transport to an approved disposal site.				
Where significant volumes of oils/solvents are being collected, determine if there are appropriate high level alarms on the sumps or separators.				

3.2 Spill Response

Requirement Seismic operations shall have a spill contingency plan. All personnel shall be familiar with the contingency plan.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A spill response plan is documented.				
Personnel are familiar with their roles and responsibilities in spill response.				
Vessel and survey personnel are trained in the use of the clean-up equipment and any personal protective equipment.				
Spill reporting procedures are posted.				
Response equipment is appropriate for the products that could be spilled.				
Adequate supplies of sorbent materials are available at locations where spills could be expected to occur.				
Where a spill has taken place, verify that sorbents and other clean-up wastes were disposed of in accordance with regulations and the contingency plan.				
Spill records are maintained, including location, volume, released chemical, response provided, recovery actions, and any follow up.				

Where required, spills have been reported to regulators (National Environment and Planning Agency) and records retained.				
Guidance				
Refer to: ARPEL Guideline #14 SEIS 8.0 Spill Response; Fisheries and Oceans Canada, 2007. Mitigation of Seismic Noise in the marine environment, Statement of Canadian Practice, found at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/im-gi/seismic-sismique/statement-enonce_e.asp				

4.0 CHEMICAL HANDLING AND STORAGE

Requirement Chemicals shall be properly stored and handled to minimize pollution risk.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
All chemicals are labeled.				
Storage procedures comply with those specified by the manufacturer.				
Material safety data sheets provided by the manufacturer are available to the crew.				
Crew are trained in proper handling for individual chemicals. This training includes the use of personal protective equipment.				
Records of chemical purchase, usage, storage and spills are available.				
A record of all chemicals in use and their storage locations is kept and easily accessible.				
Appropriate transfer methods are used when handling or moving chemicals.				
Steps have been taken to use the least hazardous solvents or other hazardous materials.				
Guidance				
Refer to: ARPEL Guideline #14 SEIS 9.0 Chemical Handling and Storage				

5.0 WASTE MANAGEMENT

Requirement Disposal of wastes shall be carried out in a manner that does not impair environmental quality.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A waste management plan exists, that excludes disposal at sea of solid and liquid (including sewage) waste.				
Wastes are handled and disposed according to the waste management plan.				
Hazardous wastes are segregated from domestic and other wastes.				
Hazardous material wastes are handled in accordance with the manufacturers' directions and/or applicable legislation.				
Crew are trained in the waste management plan and proper waste handling.				
There are records of all waste transfers.				
Wastes sent to local facilities have been properly transported and disposed, following the waste management plan.				
Guidance				
Refer to: ARPEL Guideline #14 SEIS 10.0 Waste Management; Fisheries and Oceans Canada, 2007. Mitigation of Seismic Noise in the marine environment, Statement of Canadian Practice, found at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/im-gi/seismic-sismique/statement-enonce_e.asp				

6.0 ABANDONMENT / CLEANUP OPERATIONS

Requirement Proper cleanup operations shall be implemented upon completion of seismic operations.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A clean-up plan exists, covering shoreline, debris, chemicals, etc.				
Guidance				
Refer to: ARPEL Guideline #14 SEIS 11.0 Abandonment Cleanup Operations				

APPENDIX C - REFINERY OPERATIONS PROTOCOL

This appendix contains audit checklists that were prepared to be used for audits of PCJ's refinery. However, this checklist can be used by other oil and gas companies although they should be adapted to their specific –local- regulatory framework and/or corporate procedures.

Checklist for Conducting Environmental Audits: Refinery Operations

Prepared for:
Petroleum Corporation of Jamaica

The user is encouraged to have at hand the ARPEL Guideline #14 "Guidelines for Conducting Environmental Audits for the Petroleum Industry Operations" (1997), found at http://portal.arpel.org/apps%5Carpel%5Cml_lib_nueva2.nsf/0/0EF86569B866C51003257226006D3465?opendocument&FolderID=4456269EDB93459803257213005F63F0

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1.0 MANAGEMENT

1.1 Approvals

Requirement				
Required licenses, permits and letters of authority have been obtained for the planning, design, construction and operation of any refining facility. Any special conditions or restrictions are reviewed and enforced.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Required permits, licenses and regulatory authorizations for the refining facility are available on site.				
Conditions, restrictions and requirements of permits and licenses have been included in facility design and operation.				
Facility operators are aware of the conditions and restrictions, and environmental concerns for the operations of the facility.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 1.0 Regulatory Environmental Authorization				
Check office and site records for permits and regulatory authorizations.				
Check design documents, such as As-Built drawings, for inclusion of any specific environmental management structures.				
Check that permits and licenses are available on site.				
Check for documentation and reports that address limitations or conditions required by the permits, such as:				
<ul style="list-style-type: none"> • Annual monitoring programs for soil and water • Air monitoring reports for stack temperature or air quality exceedence reports • Surface water management and release reports • Spill reports 				
Interview refinery operators regarding specific permit requirements, the documentation, training and reporting of these permit requirements.				

1.2 Design and Planning

Requirement				
Environmental protection and mitigation are considered and incorporated into site and facility planning, prior to construction. Operating procedures incorporate and document management and mitigation processes for environmental concerns.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Environmental concerns were considered during the selection of the facility site or placement of process trains or vessels.				
Process documentation exists, including potential pollutants, mitigation measures, and environmental controls.				
Operating procedures include mitigation of potential environmental impacts.				
Facility siting avoids environmentally significant locations.				

Spill prevention is considered in engineering design.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 3.0 Environmental Concerns; REFIN 6.0 Processing				
Check for:				
<ul style="list-style-type: none"> • environmental impact assessments, including assessment of: <ul style="list-style-type: none"> - terrestrial resources including soil, vegetation, wetlands and wildlife - water resources including surface water quality and quantity, river beds, marine water and shore and groundwater - marine wildlife - air quality modeling - noise, health and human impact assessment • zoning and planning documents • surface water management plans and facilities • dedicated process drains • transportation plans or traffic assessments • minimizing contact with urban settlements • soil conservation and reclamation plans • process documentation including environmental mitigations 				

1.3 Site Security

Requirement				
Access control shall be implemented for safety and to minimize additional disturbances to the environment where local population, livestock and wildlife encroachment may interact with a refinery.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Access is controlled through appropriate use of fences, signs or gates.				
A visitor log is kept and is part of emergency response planning.				
Signs are clearly legible and posted as needed and maintained.				
Fences and gates are in good condition.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 18.0 Access Control				

1.4 Training

Requirement				
Refinery operating personnel are trained and aware of the environmental impacts of their operations. Personnel understand the necessity for environmental planning and protection measures.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Personnel have taken environmental training in their field of operations and are clear on how to implement and use their training correctly.				
Personnel update their training yearly, or as required by law.				
Environmental training manuals and reference programs are available.				

Funds are made available annually for environmental training.				
Training records are up-to-date.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 2.0 Personnel Training				
<p>Check that training guidelines for each job exist. Check training records for personnel and ensure they are up to date. Confirm that personnel are trained for the environmental requirements of their job and as per the guidelines. For example:</p> <ul style="list-style-type: none"> • emergency response/spill containment training, • waste management, • hazardous materials handling specifications, • transportation of dangerous good guidelines, • current regulatory requirements and best operating procedures. <p>Identify the system by which personnel are reminded to update training – are records available? Check the reference library for manuals and guidelines. Check each department for appropriate training manuals. Interview managers and personnel regarding training schedules and funding.</p>				

1.5 Records

Requirement				
A comprehensive records management system is in place.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Version control is in place for procedures.				
Up to date engineering drawings are on file, including as-built drawings				
Guidance				
See ISO 14001 records management questions.				

2.0 SPILL PREVENTION

2.1 General Spill Prevention and Site Housekeeping

Requirement All sites shall be maintained properly and kept neat, clean and safe.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Site is kept neat, tidy and free from litter and waste equipment.				
General housekeeping is focused on reducing drips, spills, overflow or other loss.				
Process area drains go to either recovery tanks or impermeable and/or lined retention pond for appropriate disposal (and do not drain to ground or directly to surface water).				
Vegetation control is being used appropriately on site in order to minimize fire hazards and to provide easy access for maintenance.				
Lighting is sufficient for operating procedures.				
Facilities and operations have equipment and procedures in place to prevent spillage or reduce impacts to the environment as a result of a spill.				
Pressure relief valves, rupture disks or burst plates that are installed on filter vessels or treaters are connected by suitable piping to an open pop or release tank.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 20.0 Housekeeping				
Housekeeping refers to the general maintenance of a site with respect to acceptable operating practices, upkeep maintenance and overall orderliness of the grounds, buildings and equipment.				
Mechanical methods of vegetation control are usually preferred but chemical methods can be used in some circumstances. Chemical methods are not recommended where there is a high water table or marine shore.				

2.2 Integrity Management Program

Requirement An integrity management program is required.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
An integrity management plan is in place, including cathodic protection, pipeline integrity, tank testing and inspection, leak detection, and volume metering.				
A company protocol for cathodic protection on underground facilities has been established.				
Appropriate cathodic protection methods have been implemented (see guidance below).				

Guidance
Refer to: ARPEL Guideline #14 REFIN 9.0 Cathodic Protection; REFIN 32.0 Release/Spill Prevention; REFIN 13.0 Product Storage
Cathodic protection can be applied by two methods: sacrificial or impressed current methods. Sacrificial anodes are most commonly used on small steel structures such as tanks; however, the method has also been used on short pipelines. Impressed current cathodic protection is typically used on pipelines which cover a large distance.
See also sections on Aboveground Storage Tanks and Underground Storage Tanks, for leak detection management and tank testing.

2.3 Preventive Maintenance

Requirement				
A preventive maintenance (PM) program is detailed for all processes and implementation is documented.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Regular maintenance/turnaround schedules exist and are followed.				
Monitoring of dedicated recovery tanks or ponds is carried out to ensure no overflow or leakage.				
PM program includes: <ul style="list-style-type: none"> • Routine inspections of vessels (e.g., tanks, knockout drums, etc.), meters, pressure relief valves, etc. • Modification of existing processes or vessels to prevent spills • Corrosion control and monitoring • Leak detection and automatic shut-down systems • Regular inspection and maintenance of containment facilities such as berms, drip pans, dedicated drains, etc. 				
Procedures are undertaken by operators to ensure all equipment is in proper working order. Procedures may include leak detection, corrosion evaluation, metering assessment, etc.				
Maintenance procedures are documented.				
Operators are trained in maintenance procedures.				
Maintenance procedures and schedules are followed.				
Maintenance records are kept.				
Meter stations are calibrated and inspected on a regular basis, and flow measurements are analyzed to ensure early detection of product or feedstock loss.				

Requirement				
A preventive maintenance (PM) program is detailed for all processes and implementation is documented.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Guidance				
Refer to: ARPEL Guideline #14 REFIN 7.0 Filter Vessels and Treaters; REFIN 16.0 Site Maintenance				
Check for:				
<ul style="list-style-type: none"> • filter vessels and treaters are maintained. • signs of spills 				
Other methods to prevent oil spills are acceptable if they provide equivalent or better protection than the venting of relief devices to an open pop or release tank.				

2.4 Facility Marking

Requirement				
Tanks and distribution lines shall be located such that they cannot be easily damaged by moving equipment. Design techniques must be employed to prevent pressure eruptions and reduce fire hazards.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Documented procedures are in place describing marking and protection of buried or surface pipelines such as site security and anti-corrosion programs.				
Lines are marked and maintained and records are checked before any excavations are started.				
Underground distribution lines are marked on engineering drawings and located before excavation work.				
Engineering design and operations of a pipeline utilizes emergency valve shut-off and leak detection programs and procedures.				
Pipeline systems are inspected for such items as placement of shut-off valves, marked facilities, erosion control, vegetation management and spill cleanup. Inspections are documented and reported.				
Guidance				
Refer to: ARPEL Guideline # 14 REFIN 12.0 Distribution Lines				

3.0 EMERGENCY RESPONSE

3.1 Emergency Response Plan

Requirement				
An Emergency Response Plan exists to protect the public, employees, the environment and property should an emergency occur.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
An appropriate up-to-date emergency response plan exists and is available on-site.				
Employees are trained in the Emergency Response procedures.				
Emergency drills are held at least once a year, and records are retained on the learnings from the drill.				
The Emergency Response Plan has been communicated to local emergency responders and organizations with whom a mutual-aid agreement is in place.				
Regular communication on emergency preparedness with neighbouring communities takes place and consultations are documented.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 34.0 Emergency Response				
An Emergency Response Plan should contain the following information:				
<ul style="list-style-type: none"> a Regulatory Information b Scope of the Emergency Plan c Local public involvement d Contents of the Emergency Procedure Plan: <ul style="list-style-type: none"> - An introduction which clearly indicates which facilities are covered by the plan, the size of the emergency planning zone and the potential H₂S release rates (if applicable). - An emergency definition and action plan which identifies the different stages or levels of alert and the action necessary. - Detection and location of a release which describes the various methods by which a release may be detected. - Definition and isolation of a hazard area. - Communication procedures between the release site, the company control center, government agencies and public representatives. - Evacuation and notification procedures. - Ignition procedures. - Control procedures to take control or shut-in the release. - Responsibilities of company personnel. - Responsibilities of government agencies. - Media relations to give personnel direction when dealing with the news media. - Post-emergency procedures. - Procedures to update the plan on an annual basis. - Emergency contact lists. - Overall site plan. 				
All material and equipment specified in the Emergency Response Plan is available onsite.				

3.2 Spill Response

Requirement A comprehensive spill response plan is in place to limit impact to the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
There is a spill/release contingency plan for the refinery.				
Personnel are familiar with the plan and their roles and responsibilities in spill response.				
Spill response training is provided to all appropriate site personnel, and training records are kept.				
Spill response training includes information on disposal of materials used to manage and contain the spilled material.				
Spill response and process shut down processes are practised on a regular basis, and records are available for review.				
Results of practice drills are incorporated into spill response planning and training.				
Spill response kits are complete and easily accessible.				
Spills are contained appropriately for the chemical in questions, according to MSDS protocols.				
Spill records are maintained, including location, volume, released chemical, response provided, recovery actions and any follow up.				
All storage areas have spill containment and spill recovery systems such as berms, spill drains, spill recovery collection tanks and oil recovery technology.				
Guidance				
Refer to: ARPEL Guideline # 14 REFIN 13.0 Product Storage; REFIN 33.0 Spill/Release Contingency Plans; REFIN 22.0 Release of Hydrocarbons; REFIN 32.0 Release/Spill Prevention				
<p>The contents of the spill emergency response contingency plan include the following information:</p> <ul style="list-style-type: none"> a A definition of the emergencies covered by the plan. b The procedures for handling and investigating leakage reports. c The procedure for alerting company personnel and affected outside parties. d A clear definition of the responsibilities of everyone involved. e Guidelines for reaction and control, including shut-down procedures, leak locations, leak isolation, spillage/release containment, watercourse protection, etc. f Methods for immediate corrective action including spill/release control containment recovery, restoration and rehabilitation of the affected resource. g Guidelines for the protection of operating personnel and the general public. h Safe work procedures for pipeline repair. i Guidelines for post-repair inspection and returning the line to service. j Maps and descriptions of each subsection of the pipeline system. k Guidelines for public relations and the dissemination of information. l A telephone contacts summary. 				

Determine locations, types and quantities of spill control materials available onsite. These may include: sorbent materials, oil retention booms, sand bags or temporary curbing devices, recovery pumps and collection hoses, recovery tank trucks and protective equipment.

Review any past incident reports. If there have been any releases in the past, a review should be undertaken to review the causes of the release and to provide recommendations as to how such a release can be avoided in the future. The review should include an assessment of the contingency plan and the response as well, assessing whether there should be any improvements made to the plan or the training provided.

Spill response kits may include: sorbent materials, oil retention booms, sand bags or temporary curbing devices, recovery pumps and collection hoses, recovery tank trucks and protective equipment.

Spill records include the location and size of any spills, the environmental receptor (soil, surface water, marine water, etc.), the measures taken to control and remediate the spill, and any volume recovered. A sketch of the spill area is valuable.

4.0 AIR

4.1 Emissions Control Program

Requirement				
Gaseous emissions in refining facilities shall be controlled and minimized.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Local regulations regarding gaseous emissions have been identified and provided as guidelines for emissions control program implementation in the facility.				
The emission control program considers greenhouse gases, ground-level ozone, nitrogen oxides, hydrocarbons, sulfur oxides, carbon monoxide, particulates, and may consider other emissions.				
The gaseous emission control program contains both ambient air monitoring objects and emission monitoring objectives.				
The emission control program includes emergency response planning and communication with surrounding residents and employees.				
The emission control program includes focus on energy efficiencies and feasible reductions in older facilities, and engineering design and inclusion of effective emission reduction technologies in new facilities.				
Loadout operations include vapor recovery technologies, as per ARPEL Guideline #7, Reduction and Control of Gaseous Emissions from Petroleum Refineries, pages 90-91 ¹ .				
Flare system design, operation and facilities consider combustion and emission controls as per ARPEL Guideline #7, pages 22 – 34.				
The emission control program includes a progressive approach to fugitive emission reduction, capture and recovery, as per ARPEL Guideline #7, pages 61 – 74.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 30.0 Gaseous Emissions				
If local guidelines do not exist, ARPEL Guideline #7 provides the components of an emissions control program.				
Ways to reduce gaseous emissions may include:				
<ul style="list-style-type: none"> a Increasing efficiency per unit of energy produced b Reducing sources of emission in all operations c Air quality monitoring, reporting and tracking systems (measured quantities of emissions, reports, etc.) 				

1

http://portal.arpel.org/apps%5Carpel%5Cml_lib_nueva2.nsf/0/8A6BB0B9020ADD2F03257226006D3467?opendocument&FolierID=F7016BE453531A560325721200658405

4.2 Air Quality Monitoring

Requirement Air quality monitoring is required at some locations of the facility to comply with existing regulations or when due to resident or landowner concerns.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Monitoring guidelines are in place for both ambient air and emission source air quality.				
Ambient air monitoring is carried out on a regular basis, and results are recorded and compared to the criteria in ARPEL Guideline #7, Appendix A.				
Air emission monitoring is carried out on a regular basis, and results are recorded and compared to the criteria in ARPEL Guideline #7, Page 12.				
Fugitive emissions monitoring equipment is maintained, calibrated and tested on a regular basis (ARPEL guideline #7, Page 71).				
Monitoring results are recorded and reported.				
Odours are minimized.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 31.0 Air Quality Monitoring. If local guidelines do not exist, ARPEL Guideline #7 provides the components of an emissions control program.				
Long term emissions can have an adverse impact on soil and water.				
Monitoring and reporting requirements may include:				
<ul style="list-style-type: none"> a Standard site criteria for monitoring b Documentation c Total sulphation calculations d Hydrogen sulphide calculations e Water soluble fluoride calculations f Dustfall calculations g Soil pH monitoring procedures h High volume sampling procedures i Vegetation fluoride analysis j Quality assurance procedures k Heavy metals analysis l Source emission survey report format 				
Air quality sampling is done with many different pieces of equipment including mobile trailers, stationary trailers and "birdhouses". Verify that sampling equipment is in working order and correctly calibrated.				

4.3 Flare Stacks

Requirement Flare stacks are designed and operated to minimize impact to the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Flare stack design incorporates current emission targets.				
Flare stacks are located with appropriate set backs to buildings, residences, trees, and other facilities.				

Operational requirements for flare stacks are met (e.g., continuous flare or automatic ignition system, alarm, combustion temperature monitoring, etc.)				
A liquids separation unit (knock out drum) is part of the flare system, and is operational.				
The separated liquids are recovered out of the separation unit, not sent to flare. Records of liquid recovery are available.				
Liquid separation units have an overflow shut down system, and it is operational.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 21.0 Flare Stacks; ARPEL Guideline #7, Reduction and Control of Gaseous Emissions from Petroleum Refineries.				
Inspect the location of flare stacks to see if liquids have sprayed off the stack.				
Free liquids can escape up the flare stack to pollute the land.				

4.4 Hydrocarbon Emission Capture

Requirement All hydrocarbon release points shall be piped into a vapor recovery unit.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
The utilization and placement of vapor recovery units is marked on engineering drawings.				
Vapor recovery units are operational.				
Collected vapors are incinerated.				
Records are kept of incineration of hydrocarbon vapors.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 14.0 Vapor Recovery Units				

4.5 Sulfur Emission Control

Requirement Sulfur recovery operations, storage and transportation shall be performed so as to limit impacts to the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Specific emission rates are included in plant licenses, and licenses are available on site.				
Emission rates are monitored and results are recorded.				
Stack surveys are completed annually.				
Temperature monitoring is carried out on a regular basis and recorded.				
Sulfur is transported safely and dust control measures are in place.				

Sulfur loading procedures are documented and communicated to facility staff.				
Impact of sulfur dust on adjacent soil, vegetation and surface water quality is monitored and results are recorded.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 8.0 Sulfur Recovery				
Check for:				
<ul style="list-style-type: none"> • License requirements. • Operations manuals for sulfur recovery equipment including stacks. 				

4.6 Noise

Requirement				
The impact of refining operations' noise on local residents and workers shall be minimized.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Sources of noise are documented.				
Noise guidelines are applicable and implemented.				
Noise abatement processes are considered in design.				
Consultation with neighbouring residents is documented and reported.				
Public complaints are documented and responded to.				
Ambient sound surveys to measure existing sound levels have been completed where appropriate.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 23.0 Noise				

5.0 STORAGE AND HANDLING OF FUEL AND CHEMICALS

5.1 Chemical and Hazardous Materials Storage and Handling

Requirement				
All chemicals and hazardous materials are stored safely and labeled properly such that impact to the environment is minimized.				
Chemical and hazardous materials shall be stored and labeled properly.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
All chemicals are labeled on the container.				
A record of all chemicals in use in the refinery and their storage locations is kept and easily accessible.				
A materials safety data sheet system is in use, to clearly identify chemicals and proper handling.				
Operations workers are trained in proper handling and storage of specific chemicals in use in the refinery. This training includes the use of personal protective equipment.				
Appropriate transfer methods are used when handling or moving chemicals.				
Chemical volumes are recorded and usage is tracked.				
Guidance				
Refer to: ARPEL Guideline #14 reference: REFIN 15.0 Chemical and Hazardous Material Storage and Handling.				
Chemical storage and handling may have many components:				
<ul style="list-style-type: none"> a Bulk tanks should be used for storage whenever treatment/corrosion chemicals are routinely added to process lines, regardless of volumes consumed. b All tanks should be fitted with an external gauge to monitor content level. The tank must be externally vented if located in a building. c All metal storage/bulk tanks and/or frames should be electrically grounded. d Tanks larger than 500-1000 barrels should be bermed or an equally effective means identified to prevent excessive contaminations to the surrounding area in the event of a major spill or tank fracture. e Bulk storage tanks should be clearly labeled to identify contents. f When wall mounted drums (45 gallon) are used as bulk tanks, the refilling process should be carried out using a barrel transfer pump. The barrel pump construction should be suitable for use with the specific chemical. Barrel pumps and both containers involved in the transfer should be grounded. g Spill containment pans or facilities are in place below drums or smaller tanks. h Small quantities of chemicals are stored under a shelter, with ventilation and spill containment. i consideration is given to separating the storage areas of chemicals which might adversely react with each other should an accidental release occur. 				
Manual handling of chemicals is discouraged. The transportation of chemicals or empty chemical containers inside buildings or closed vehicles must be avoided. Open top trucks or the equivalent should be used when transporting chemicals. If a non-routine manual chemical treatment is required, then the workers are required to:				
<ul style="list-style-type: none"> a Wear full personal protective equipment specific to the particular chemical being handled. Suitable respiratory protective equipment should be readily available and used when toxic or volatile chemicals have been identified in a product. b Use pails with tight fitting lids. c Chemical drums or pails must be secured and sealed to prevent spillage during vehicle transport. 				

5.2 Pipeline, Truck and Rail Loading / Unloading

Requirement Loading and unloading procedures shall be performed in a manner that prevents pollution to the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Pipeline, truck and rail car bulk receipt of raw and produced products shall have environmental control systems in place (such as emergency shut down systems, gauges, lock out valves, etc.) to effectively store, handle and transfer product in an environmentally safe manner.				
Tanks, trucks and trailers shall be properly maintained, and service records are kept.				
Operators have been trained in transportation safety and environmental protection.				
Facility personnel are in continuous attendance when trucks are loading and unloading.				
Spill containment facilities are incorporated into the loading facilities.				
Interlock warning lights are used in loading and unloading areas to prevent the departure of trucks before lines are disconnected.				
All loading facilities are designed to prevent or reduce accidental discharge.				
Guidance				
Refer to: ARPEL Guideline #14: REFIN 10.0 Bulk Product Receipt and Delivery				
<ul style="list-style-type: none"> • Determine hours trucks should be operating. • Through interviews, determine driver training effectiveness including training in transportation of dangerous goods, spill response, etc. • Inspect the loading areas to assess general housekeeping, control and cleanup of leaks and assess transfer operations which are in progress. 				

5.3 Marine Terminal Transfer Operations

Requirement Loading and unloading procedures shall be performed in a manner that prevents pollution to the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Pipeline receipt or transfer of raw and produced products shall have environmental control systems in place (such as emergency shut down systems, gauges, lock out valves, etc.) to effectively store, handle and transfer product in an environmentally safe manner.				
Pigging facilities are maintained and pigging fluids are contained and disposed of according to the waste management plan.				
Aboveground pipelines are inspected on a regular schedules basis, and results are recorded.				

Volume reconciliations as a measure of pipeline integrity are recorded.				
Guidance				
Refer to: ARPEL Guideline # 25 Control of Contamination from Marine Terminals ² : 7.0 Marine Terminal Transfer Operation				

5.4 Aboveground Storage Tanks (ASTs)

Requirement				
Operation of aboveground tanks shall be carried out in a manner that does not cause damage to the environment. Tank operations include all work which is done in conjunction with tanks. Examples are gauging, loading and unloading of tanks and emergency containment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A shop-fabricated aboveground storage tank system:				
- has corrosion protection				
- has a secondary containment system				
- has leak detection				
- has containment sumps, as applicable				
- where a high-level alarm system is used, have audible and visual alarms located where personnel are constantly on duty during the product transfer operation and can promptly stop or divert delivery to the tank				
A horizontal storage tank is supported above grade level.				
Storage areas are clearly marked with signs and labeling on tanks.				
Aboveground tanks must be located within an impervious containment system sufficiently large to accommodate 100% of the largest tank volume. The capacity of the diked area must be calculated by deducting the volume of the tanks other than the largest tank (below the height of the dike).				
If any produced liquids enter the diked area, they must be collected and disposed of in an acceptable manner.				
Containment systems are maintained and monitored for leaks on a regular basis.				
Results of leak monitoring are documented and reported.				
Tanks are painted with a protective coating to prevent corrosion or rusting				
Periodic inspections of tanks, leak detection systems and dikes are conducted and results are recorded.				

Aboveground tanks are protected against impact from a motor vehicle.				
Where a tank is located in an area subject to buoyancy because of flooding, uplift protection is provided.				
Aboveground tanks are not filled in excess of 95% of their capacity.				
Operators are trained to incorporate measures to prevent the overfilling of tanks. These may include automatic shut-off devices, alarms or visual indicators.				
Guidance				
Refer to: ARPEL Guideline # 14 REFIN 11.0 Tank Operations; ARPEL Guideline #18, Guideline for Control of Contamination from Aboveground Storage Tanks ³				
International Fire Code (2006), Chapter 34 (Flammable and Combustible Liquids)				
A leak detection system can include: <ul style="list-style-type: none"> a A synthetic liner with a monitoring well. b Annual interstitial monitoring of double walled tanks. c Annual visual detection of vaulted tanks. d Monthly monitoring of weeping tile systems if the soil is of low permeability. 				
Special testing programs for tanks may include: 100% external inspection, internal inspection, hydrostatic leak tests, soil vapor and ground water monitoring or another method that provides the same level of confidence.				

5.5 Underground Storage Tanks (USTs)

Requirement				
Operation of underground tanks shall be carried out in a manner that does not cause damage to the environment. Tank operations include all work which is done in conjunction with tanks. Examples are gauging, disposing of tank bottoms, loading and unloading of tanks and emergency containment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Tank storage areas are clearly marked with signs.				
Underground tanks (USTs) are double walled.				
If USTs are single walled, they have secondary containment structures.				
A leak detection system on tanks is in place and regularly monitored.				
Results of leak monitoring are documented and reported.				
Operators incorporate measures to prevent the overfilling of tanks. This may include automatic shut-off devices, alarms or visual indicators.				

Periodic inspections of tanks, leak detection systems and liners are conducted and recorded.				
Appropriate testing of USTs is undertaken on a regular basis, and results are documented and reported.				
A reporting and documentation process exists in case of leaking from USTs.				
Guidance				
<p>Refer to : ARPEL Guideline # 14 REFIN 11.0 Tank Operations ARPEL Guideline #8, 2nd Edition, Guideline for Control of Contamination from Underground Storage Tanks⁴</p> <p>Underground tanks do not require secondary containment if the site exhibits low permeability soil plus a seasonally high groundwater table that is not within 1m of the bottom of the tank.</p> <p>Secondary containment for underground storage tanks includes:</p> <ul style="list-style-type: none"> a Double wall tanks where the void space may be monitored. b An impervious synthetic liner that is compatible with the product being stored. c Tanks contained in reinforced concrete or steel vaults. d Any other system that provides the same level of protection as those listed above. <p>Suitable testing of underground storage tanks includes: internal inspection, hydrostatic leak tests, pneumatic leak tests, soil vapor and groundwater monitoring, or another method that provides the same level of confidence.</p> <p>Inspect any logbooks or incident reports.</p>				

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6.0 SOILS

Requirement Soil sampling and monitoring protocols are in place according to guidelines. Sampling programs and results are documented and documentation is retained.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A soil sampling monitoring program is in place to meet the regulations or guidelines.				
Records of soil sampling and monitoring programs are available.				
Soil conditions associated with leaking tanks or spills have been investigated and reports are available for review.				
Where appropriate, soil investigation reports have been distributed to regulators.				
Where appropriate, soil remediation programs have been undertaken.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 27.0 Soil Sampling and Monitoring; ARPEL Environmental Guideline #37, Integrated Management of Wastes in Downstream Facilities, 2005 ⁵ ; ARPEL Environmental Guideline #3, Management of Petroleum Refinery Solid Waste ⁶ .				
Soil monitoring activities may be completed to track the progress of a decontamination program, to determine the extent of a spill and develop remediation programs. Soil monitoring may be undertaken at any time of a facility's life, from pre-disturbance, during operations or during reclamation. Common areas for soil monitoring programs include:				
<ul style="list-style-type: none"> • Aboveground and underground storage tanks sites; • Load out facilities; • Process facilities. 				

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7.0 WATER AND WASTEWATER

7.1 Groundwater

Requirement				
A groundwater monitoring system will be in place, to determine any on site contamination of groundwater, or possible off site movement.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A groundwater sampling and monitoring program is in place to meet the regulations or guidelines.				
Records of groundwater sampling and monitoring programs are available.				
Stakeholder consultation regarding programs and results is documented.				
Wells are capped and maintained.				
Sampling protocols exist and sampling personnel are trained in sampling techniques, including chain of custody requirements.				
Analytical protocols are appropriate for potential sources.				
Groundwater monitoring wells are decommissioned when no longer required.				
Groundwater conditions associated with leaking tanks and spills have been investigated.				
Where appropriate, groundwater investigation reports have been distributed to regulators.				
Where appropriate, groundwater remediation programs have been undertaken.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 28.0 Groundwater Monitoring				
Groundwater monitoring is a site specific issue. Wells should be installed hydraulically up gradient and down gradient of a potential contaminant. These wells will be used to determine the depth and direction of groundwater flow. Monitoring wells must be set in an area that will not interfere with everyday operations, however, they must be set in order to collect the required information.				

7.2 Water Conservation

Requirement				
All water usage shall be assessed for the potential of recycling or reuse. Water usage shall be minimized by employing the basic principles of water conservation through reduction of the volume of water used, effective recycling, and maximizing reuse. Emphasis should be placed on concentrating waste materials in limited volumes of water.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Water usage at the refinery has been assessed and documented				
Water usage is monitored				
Reasonable reduction targets have been set				
Conservation efforts are in place				

Guidance
Refer to ARPEL Guideline #14, REFIN 45.0 Water Recycling and Reuse

7.3 Stormwater Management

Requirement				
Stormwater run-on and run-off must be controlled to minimize contamination of local water bodies.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Stormwater is segregated from industrial process water				
The facility complies with stormwater monitoring requirements				
Surface water control and release structures exist and are shut to prevent accidental release of runoff water				
If in use, perimeter berms are placed appropriately to divert surface water run off from impacting (erosion, contamination, etc.) adjacent soil, water or wetlands.				
Interception ditches are in place and are linked to surface water holding ponds.				
Guidance				
Refer to ARPEL Guideline #14, REFIN 26.0 Surface Water Monitoring ARPEL Guideline #14, REFIN 24.0 Drainage and Erosion ARPEL Guideline #14, REFIN 19.0 Perimeter Berms				

7.4 Stormwater and Industrial Wastewater Ponds

Requirement				
Ponds shall be used to collect surface runoff, process liquids (potentially oily water) and industrial wastewater. Collected liquids will be managed through treatment, sampling and analysis to ensure liquid in each pond meets criteria before releasing, treating or disposing.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Pond and associated equipment design is in compliance with API procedures and regulations or any other acceptable standards.				
Ponds are constructed from a compacted bentonite or in-situ clay with a hydraulic conductivity no greater than 1×10^{-7} cm/s or other low permeability material. Otherwise, ponds must have an impermeable liner or be constructed of concrete				
Pond design and operations incorporate facilities or procedures to separate floatables such as oil (i.e., skimming, floatation, separation, treating and pumping equipment).				

Ponds are situated to match the natural drainage of the site topography and graded to minimize erosion and flooding.				
Ponds are designed to control the rainfall established from meteorological statistics for that area.				
Separate ponds are used for each type of fluid stream collected (i.e., oily water pond, surface runoff pond, etc.). Measures are taken to avoid cross contamination between ponds.				
Pond levels are monitored and pumped off routinely to ensure no overflow occurs.				
Guidance				
Refer to				
<ul style="list-style-type: none"> • ARPEL Environmental Guideline #37, Integrated Management of Wastes in Downstream Facilities, 2005. • API document, "Laboratory Analysis of Petroleum Industry Wastewaters" 1999. Accessed at http://www.api.org/ehs/water/upload/4694-1999.pdf • ARPEL Guideline #14, REFIN 25.0 Surface Retention/ Holding/Industrial Runoff Ponds 				

7.5 Surface Water Monitoring

Requirement				
Adjacent surface water shall be monitored after spills, after controlled acceptable releases and as required to monitor water quality.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Legislated requirements and guidelines regarding surface water quality have been identified and are available on site.				
Sampling protocols are in place and are followed.				
A reputable laboratory performs analyses of surface water.				
Records of surface water monitoring events and results are kept.				
Monitoring results comply with legislation/guidelines.				
Guidance				
Refer to ARPEL Guideline #14, REFIN 26.0 Surface Water Monitoring				

7.6 Water Release

Requirement				
Discharge of water to the environment shall be minimized.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Legislation and guidelines regarding water releases have been identified and are known to facility personnel. Minimum standards are ARPEL Guideline #14 (see below)				

There is documentation and a reporting procedure for water discharges to the environment.				
Procedure is established and communicated for managing water that doesn't meet release standards.				
Sampling personnel are trained in field sampling and analysis techniques				
Field sampling and analysis occurs before a water release and results are documented and retained. Records include the analytical parameters listed below, as well as an estimation of the volumes of water released.				
Water discharged is not allowed to flow directly into rivers, creeks or any other permanent body of water				
Guidance				
Refer to ARPEL Guideline #14, REFIN 29.0 Water Release				
Surface water samples must meet the following minimum standards before release:				
<ul style="list-style-type: none"> a Water pH must be between 6.0 - 9.0. b Oil and grease cannot exceed 10 mg/L or no visible hydrocarbon sheen on the water surface. c Chlorides must not exceed 500 mg/L. d No other chemical contamination. 				
If the discharged water does not meet the above criteria, the fluid must be disposed of at an approved waste disposal facility or treated and then discharged with the approval of existing regulatory agencies.				

7.7 Industrial Wastewater

Requirement				
No effluent shall be discharged unless it meets minimum requirements of existing local regulations. Regulations usually limit the deposits of oil and grease, phenols, sulphide, ammonia nitrogen, total suspended solids and the pH levels. The wastewaters from the various units should be diverted to the wastewater treatment facility.				
Refinery plants shall comply with effluent monitoring requirements according to existing local regulations.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Wastewater treatment/disposal is in compliance with applicable legislation				
The flow through the effluent treatment system is carefully controlled.				
The facility complies with effluent monitoring requirements. Legislation may require that a number of pollutants be monitored to demonstrate that the effluent treatment system is being operated consistently.				
Oil skimmer units are in place on process related ponds or water catchment areas.				
Disposal of pumped-off liquids is in accordance with the content of the liquids and any contamination.				

<p>Guidance</p> <p>A refinery may be given an exemption from the requirements for liquid effluent once-through cooling water if treatment is provided in facilities outside the refinery (such as municipal sewage systems). This exemption may be granted if the off-site facility provides treatment equivalent to that required by the regulations and guidelines.</p> <p>The best practicable treatment technology to the liquid effluents can be described as:</p> <ul style="list-style-type: none"> • Sour water stripping for ammonia and sulphide removal; • Primary separation followed by; • Intermediate treatment (such as air flotation) followed by; • Secondary treatment (such as biological treatment) • Final effluent clarification if required <p>The following pollutants may be required to be monitored by refinery plants:</p> <ul style="list-style-type: none"> • Daily monitoring: • Total suspended solids • Phenolics • pH and total organic carbon <p>Three times per week basis:</p> <ul style="list-style-type: none"> • Ammonia-nitrogen • Organic carbon • Oil and grease • Sulphides • Volatile aromatics (benzene, toluene, xylenes, ethylbenzene) • Zinc and chromium <p>Monthly:</p> <ul style="list-style-type: none"> • aromatic hydrocarbons • chlorinated volatiles • acids • metals • cyanide <p>Overloading the system hydraulically reduces the effectiveness of pollutant removal. Also, a sudden shock will upset the biological balance and performance will drop. The shock can be either an increase in pollutants or an influx of unusual pollutants.</p> <p>Refer to: ARPEL Guideline #14, REFIN 37.0 Sewage Effluent and Wastewater Treatment ARPEL Guideline #14, REFIN 38.0 Specific Effluent Monitoring Requirements</p>
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7.8 Sewage Treatment

Requirement				
Sewage treatment systems must be designed and operated to ensure that effluents do not contaminate ground or surface water or soil and do not present a health hazard.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Inspect sewage lagoons on site used to treat sewage/effluent.				
Sewage disposal/treatment facilities are designed, constructed and operated in accordance with applicable legislation.				
The following criteria are recommended:				

<p>a Maximum flow will be dependent on the dimensions of the lagoon.</p> <p>b Retention time should be sufficient to allow for decomposition.</p> <p>c Sewage decomposition should be monitored.</p> <p>d Must have sufficient freeboard to prevent overflow in case of heavy rainfall.</p> <p>e Must be fenced.</p> <p>f Vegetation control on berms.</p> <p>g Surface runoff to be diverted around the lagoon.</p> <p>h Release limits according to existing regulations.</p> <p>i Berms must be minimum 1V:3H.</p> <p>j Berms must be sufficiently wide at top to allow for equipment and personnel.</p> <p>k Bottom of lagoon must be level and flat.</p> <p>l A small pit in the bottom allows the large lagoon to be emptied.</p> <p>m Lagoon must be "relatively impervious" to control seepage (either compacted clay or lined).</p> <p>Setback distances: the lagoon must be at least:</p> <ul style="list-style-type: none"> • 300 m from any residence or assembly occupancy outside the site or not associated with the facility. • 90 m from a residence or assembly occupancy on the site. • 30 m from the property line. • 30 m from any residence. • all measurements are taken from the outside berm where the side • slope of the berm intersects with the natural grade. 				
<p>Verify that lagoon is properly built, effluent is not released before full retention time and there are no leaks.</p>				
<p>Inspect location of site for suitability of lagoon.</p>				
<p>Guidance</p>				
<p>Refer to: ARPEL Guideline #14, REFIN 43.0 Sewage Lagoons</p>				

8.0 WASTE MANAGEMENT

8.1 Hazardous Waste

Requirement				
The disposal of waste materials shall be in compliance with applicable legislation. Verify that wastes are disposed of properly by assessing the components of a waste management program listed below.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Verify that a documented Waste Management Plan is in place, and that it includes the following components:				
a A description of relevant policies and legislation				
b Formalized waste management procedures are in place, including roles/responsibilities, work instructions, training requirements, reporting requirements, and monitoring/auditing requirements.				
c One individual has been assigned the position of supervisor of the waste management program				
d Waste characterization methods				
e Monitoring/auditing plan				
f Waste tracking plan				
g Reporting requirements				
Wastes are managed by:				
a Minimizing the generation of wastes				
b Rendering hazardous wastes safe through destruction or treatment				
c Disposing in a secure manner when treatment is not feasible				
d Using technically-effective and cost-effective technologies				
Waste treatment and disposal choices have been made in consideration of: cost, local resources, legislation, and environmental impact.				
Information about the hazards and associated risks of hazardous wastes has been provided to employees, contractors, and other people on site.				
A comprehensive training program is in place for employees who handle waste. Employees are aware of the fire, health & safety and environmental aspects of wastes and can demonstrate waste management procedures.				
The highest priority in risk management has been given to those sources which pose known serious risks to the environment and/or human health.				
Realistic waste reduction/minimization targets are in place.				

Safe, secure storage facilities are in place for on-site storage of wastes.				
Necessary permits are in place for storage facilities.				
Storage facilities are accessible for fire fighting and other emergency procedures.				
Storage facilities will not be flooded by the 24 hour 10 year storm.				
Construction of storage facilities conforms with applicable building, fire, and equipment design codes.				
Access to storage facilities is limited to authorized personnel.				
Storage facilities are signed to indicate the hazards within.				
Incompatible wastes are not stored together.				
Aqueous and non-aqueous wastes are segregated.				
Storage facilities containing drums have an impervious, non-reactive floor, a curb around the perimeter of the floor (with no gaps), no floor drains connected to a sewer, and appropriate side walls and roof for weather protection.				
Waste loading/unloading areas are designed and constructed to contain spills.				
Overpack drums are used where appropriate to contain leaking drums.				
Waste containers are kept closed except when waste is being added or removed.				
Waste containers used are appropriate for the wastes they contain.				
Every waste container is labeled, stating the identity of the waste.				
Any materials spilled are contained and cleaned up.				
Emergency response procedures for the facility address potential incidents associated with waste management				
An accurate and up-to-date inventory of wastes is maintained.				
All wastes leaving the plant are documented and manifested in accordance with regulatory requirements (including information on waste type, quantity, source, destination, carrier, employee responsible)				
All waste streams have been classified/characterized (including periodic re-testing). Where necessary, independent laboratories have been used.				
A waste tracking system is in place, including manifesting of all wastes shipped off site				
A waste auditing program is in place, including records of past audits				

A waste reporting system is in place, including monthly, quarterly and annual reports. The reports include data on waste type, disposition, volumes, and cost of treatment/disposal.				
The following materials are not landfilled: <ul style="list-style-type: none"> • Free liquids and materials containing free liquids • Empty containers, unless crushed/shredded to reduce volume • Flammable solids, spontaneously combustible materials, water reactive materials, oxidizers and organic peroxides • Acid wastes, cyanides, halogenated organic compounds • Materials containing PCB compounds in concentrations above 50 ppm 				
Wastes are not sprayed onto road surfaces as a means of dust control				
Sludges are not dewatered via outdoor evaporation.				
Waste catalysts are not mixed.				
Wastes are shipped only by carriers licensed to handle those wastes.				
Filters are drained for at least three days prior to disposal, and the drained liquids are captured for appropriate disposal.				
Wastes are shipped only to facilities licensed to handle, treat, or store those wastes.				
Waste storage capacity is adequate to handle facility turnarounds and upset conditions.				
Wastes are not diluted for the sole purpose of meeting regulatory release guidelines.				
Laboratory wastes are disposed of properly.				
Waste disposal is carried out such that it does not attract wildlife.				
When handling waste, procedures are followed and personal protective equipment is worn.				
Specific waste streams are disposed of in accordance with preferred methods listed below				
Guidance				
Source/Waste	Preferred Disposal Method			
Tank bottoms - Leaded gasoline	Weathering of sludge, followed by secure landfill; chemical fixation			
Tank bottoms - Unleaded gasoline	Landfarming; chemical fixation, secure landfill; incineration			
Tank bottoms - Crude Oil	Oil recovery on site or off site; landfarming; incineration; secure landfill; chemical fixation			
Tank bottoms – distillates	Landfarming; secure landfill; chemical fixation			
Tank bottoms - Decant Oil	Landfarming; incineration; secure landfill			
Tank bottoms - bunker	Recycling; reclaiming; landfarming; secure landfill; incineration			

Guidance	
Source/Waste	Preferred Disposal Method
Tank bottoms - Slop oil	Reclaiming of oil; recycling of Fluid Catalytic Cracking Unit; landfarming; incineration
Asphalt waste	Recycle; reuse; incineration
Desalter clean out sludges	Landfarming; oil recovery; secure landfill
Caustic solution	Reclamation to a chemical plant; disposal wells; desalter pH adjustment; neutralization with acid or flue gas before injection to wastewater treatment; controlled injection to wastewater treatment plant as dictated by effluent limits
HF acid (Neutralized)	Chemical fixation; secure landfill; wastewater treatment
H ₂ SO ₄ acid (spent)	Reclaiming; neutralization and chemical fixation
Clay (spent)	Sanitary landfill; landfarming; incineration before sanitary landfilling.
Activated carbon (spent)	Recycling to supplier or sanitary landfill.
Amine filters	Sanitary landfill, landfarming
Off specification sulfur	Sanitary or secure landfill; recycling or reuse; incineration
Furfural (spent)	Incineration
Glycol (spent)	Incineration; chemical fixation, wastewater treatment system (with a biotreater)
Coke fines	Sanitary or secure landfill depending on heavy metals content; reuse as a fuel off site; chemical fixation
Stretford solution	Wastewater treatment system.
FCUU (Fluid Catalytic Cracking Unit)	Recycle; sanitary landfill catalyst (spent) chemical fixation; reuse as feed to cement kiln
FCUU dust	Recycle; sanitary landfill (wetted down); chemical fixation; reuse as feed to cement kiln
Poly unit catalyst (spent)	Secure landfill; landfarming; chemical fixation; nutrient for wastewater treatment plant
H ₂ plant catalyst (spent)	Reclaiming of metals; chemical fixation; secure landfill
Reformer catalyst (spent)	Reclaiming by supplier
Hydrocracker catalyst (spent)	Chemical fixation; reclaiming; secure landfill
Hydrotreater catalyst (spent)	Reclaiming; chemical fixation; secure landfill
Merox catalyst (spent)	Reclamation to a chemical plant; disposal wells; desalter pH adjustment; neutralization with acid or flue gas before injection to wastewater treatment
Copper chloride catalyst (spent)	Secure landfill
Claus plant catalyst (spent)	Sanitary landfill
HF Acid soluble polymer	Retrofit process and eliminate at source; lime neutralization and incineration; wastewater treatment system
Cooling tower sludge	Chemical fixation; chromate recovery; secure landfill
Lime sludge	Reuse in cement plant; sanitary landfill; landfarming
Anthracite filters	Sanitary landfill; incineration
Spent zeolite resins	Sanitary or secure landfill
Sand from filters	Landfarming; secure landfill; sanitary landfill
Ion exchange regenerant	Wastewater treatment
Gravity separator sludge	Landfarming; recycle to Coking Unit; approved industrial incineration; secure landfill
Biotreater sludge	Incineration; chemical fixation; landfarming; sanitary landfill
Storm pond silt	Chemical fixation; landfarming; landfilling
Sump sludge	Landfarming; recycle to Coking Unit; approved industrial incineration; secure landfill

Guidance	
Source/Waste	Preferred Disposal Method
Refractory brick	Secure landfill or sanitary landfill
Oil-contaminated soil	Landfarming; secure landfill
Used drums	Send drums to reclaimer; rinse, crush and sell for scrap; storage/dry shelter
PCB wastes	Secure indoor storage; secure outdoor storage; send to PCB destruction facility capable of 99.9999% destruction efficiency
Asbestos waste	Waste is double-bagged and labeled prior to landfilling
Demolition scrap	Sanitary landfill; reclaiming
Heat exchanger cleanings (solids)	Secure landfill; chemical fixation
Heat exchanger cleanings (liquids)	Secure landfill; chemical fixation Wastewater treatment after neutralization; chemical fixation; disposal wells; incineration of organics
Spent chemicals (liquid)	Aqueous: to an enclosed vented settling tank with liquid effluent to wastewater treatment system Non-aqueous, non-hazardous: to an enclosed and vented holding tank for pump out and reprocessing Hazardous chemicals: to a segregated vented holding tank for suitable treatment depending upon chemical composition
Spent chemicals (solid)	Secure landfill
Refer to: Guidelines for the Management of Petroleum Refinery Liquid Wastes, ARPEL Guideline #27. Guidelines for the Management of Refinery Solid Wastes, ARPEL Guideline #3. Integrated Management of Wastes in Downstream Facilities, ARPEL Guideline #37. ARPEL Guideline #14, REFIN 36.0 Exposure to Toxic Substances ARPEL Guideline #14, REFIN 35.0 Disposal of Refinery Wastes ARPEL Guideline #14, REFIN 47.0 Filters	

8.2 Non-Hazardous Waste

Requirement				
Non-hazardous solid wastes generated by operations shall be disposed of in an acceptable manner to prevent pollution to the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Site and rights-of-way are kept free of debris				
Non-hazardous waste is placed in metal or plastic containers and disposed of off-site				
Non-hazardous materials suitable for recycling should be stored separately and recycled accordingly.				
If incineration is an acceptable disposal practice, verify method of disposal of waste material not consumed by burning. Verify that the types and volumes of wastes incinerated				

and buried are recorded.				
Verify that the incinerator(s) is inspected and tested at least yearly to ensure optimum efficiency.				
Inspect garbage disposal sites. Garbage disposal sites should be used for small, non-toxic, non-perishable refuse and incinerator residues. Holes or pits should be located above the expected high water level. A minimum distance from the bank of a water body of 45 m is required. Consider and evaluate the potential of wildlife intrusions to the garbage disposal sites or attraction to the location				
Guidance				
Refer to				
ARPEL Guideline #14, REFIN 41.0 Disposal of General Solid Wastes				

8.3 Hazardous Materials Management

8.3.1 Asbestos

Requirement				
Measures must be taken to minimize exposure to asbestos-containing materials (ACMs) and to prevent any exposures above occupational exposure limits.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
An Asbestos Management Plan is in place, and it contains the following elements:				
An up-to-date inventory of ACMs				
Identification of roles and responsibilities, including identification of one person responsible overall for asbestos management at the facility.				
Training and awareness procedures				
Notification procedures				
Removal and monitoring procedures				
Asbestos-containing materials are labeled, where practicable				
Asbestos-containing are disturbed only in compliance with documented procedures, including (where appropriate) monitoring				
Removal records are retained				
Asbestos-containing waste materials are held in restricted zones or transported immediately to their final disposal site.				
Employees who may be exposed to asbestos are aware of hazards and the appropriate procedures and have required PPE, including respiratory protection				
The inventory of ACMs is updated at least annually				

Guidance
Refer to ARPEL Guideline #14, REFIN 42.0 Asbestos

8.3.2 Sulfur Handling (not applicable until after the refinery is expanded)

Requirement				
Proper handling, storage and transportation of sulfur is required.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Verify that appropriate precautions are taken when handling sulfur				
Personnel should take measures to alleviate or mitigate the following major issues:				
a Potential human hazards.				
b Sulfur dust producing sulfuric acid when it reacts with water.				
c Sulfur spills when pouring molten sulfur into tank cars for transportation or onto sulfur blocks for storage.				
d Handling runoff and drainage from sulfur storage areas.				
e Reclamation of sulfur contaminated soils.				
Visible sulfur dust is not present near sulfur storage areas.				
Guidance				
Refer to ARPEL Guideline #14, REFIN 49.0 Sulfur Handling				

9.0 ABANDONMENT AND RECLAMATION

9.1 Abandonment and Reclamation Plan

Requirement				
An abandonment and reclamation plan is in place				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
An abandonment and reclamation plan exists				
The reclamation plan will take into account whether it is part of a live site which is being reclaimed or whether the entire site is being abandoned.				
The plan should identify all capital salvage items, outline the salvage program, identify disposal options for items which cannot be reused, identify any contamination issues and how they are to be dealt with and specify the steps for the restoration of the site (or the portion being restored).				
The plan is based on site assessment information (Phase I, Phase II if necessary).				
The plan includes a cost estimate, inventory control, service contracts, equipment and material handling procedures, environmental protection measures, safety measures, schedule and priorities and cost control.				
The plan lists the details for the following procedures: <ul style="list-style-type: none"> • site dismantling • removal of tanks • decontamination • soil remediation • recontouring • revegetation • assessment of reclamation success 				
Guidance				
Refer to: ARPEL #14: REFIN 50.0 Reclamation Plan; ARPEL Guidelines for Decommissioning and Surface Land Reclamation at Petroleum Production and Refinery Facilities ⁸				

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http://portal.arpel.org/apps%5Carpel%5Cml_lib_nueva2.nsf/0/FCC63116BA161CF003257226006D3432?opendocument&FoiderID=4456269EDB93459803257213005F63F0

9.2 Site Dismantling

Requirement				
The physical removal of all buildings, facilities, structures and improvements – above and below ground - shall be done in an environmentally acceptable manner.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A dismantling plan exists for the facility.				
Equipment and structures are removed appropriately.				
All liquids and sludges from vessels/tanks/lines are removed for Disposal before facility removal, and removal is documented.				
Power lines, power poles, gas lines, telephone lines, and equipment were removed by a utility company, and documented.				
Concrete pads and other inert materials are broken up and are buried on site with a minimum cover of 1 m of compacted fill or it can be hauled out.				
Gravel is salvaged as much as possible				
Flowlines are cut-off and capped a minimum of 1 m below grade.				
All improvements left in place and locations of buried material				
No contaminated material is buried or covered.				
Guidance				
Refer to: ARPEL #14: REFIN 51.0 Site Dismantling, REFIN 52.0 Tank Removal; ARPEL Guidelines for Decommissioning and Surface Land Reclamation at Petroleum Production and Refinery Facilities				

9.3 Decontamination

Requirement				
Residual chemical contamination is remediated to appropriate guidelines.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Historical spills have been remediated.				
Residual contamination from vessels, processes or tanks was identified, quantified, and remediated. Remediation was documented and reported.				
Waste management guidelines were used to manage decontamination operations.				
Local, or other, appropriate chemical criteria are used to assess levels of contamination.				
Guidance				
Refer to: ARPEL #14: REFIN 53.0 Decontamination; ARPEL Guidelines for Decommissioning and Surface Land Reclamation at Petroleum Production and Refinery Facilities				

9.4 Reclamation

Requirement				
Once facilities are decommissioned and contamination is remediated, an abandoned site will be reclaimed to meet the needs of future land use.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A reclamation plan is in place for the facility.				
The reclamation plan accounts for soil decontamination, soil replacement, recontouring, and revegetation.				
The reclamation plan identifies indicators of successful reclamation, a proposed timeline, and monitoring plan.				
Stakeholders have been consulted about future land use for the site, and issues and concerns have been documented and followed up.				
The reclamation plan is suitable to the proposed future land use.				
Monitoring reclamation success is carried out on a regular basis, results are recorded and reported.				
Guidance				
Refer to: ARPEL #14: REFIN 54.0 Soil Reclamation, REFIN 55.0 Recontouring, REFIN 56.0 Revegetation, REFIN 57.0 Reclamation Assessment; ARPEL Guidelines for Decommissioning and Surface Land Reclamation at Petroleum Production and Refinery Facilities				

APPENDIX D - SERVICE STATIONS AND STORAGE OPERATIONS PROTOCOL

This appendix contains audit checklists that were prepared to be used for audits of PCJ's storage and service stations operations. However, this checklist can be used by other oil and gas companies although they should be adapted to their specific –local- regulatory framework and/or corporate procedures.

Checklist for Conducting Environmental Audits: Storage and Service Stations Operations

The user is encouraged to have at hand the ARPEL Guideline #14 "Guidelines for Conducting Environmental Audits for the Petroleum Industry Operations" (1997), found at http://portal.arpel.org/apps%5Carpel%5Cml_lib_nueva2.nsf/0/0EF86569B866C51003257226006D3465?opendocument&FolderID=4456269EDB93459803257213005F63F0

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1.0 MANAGEMENT

1.1 Approvals

Requirement				
No person shall construct or cause to construct, install, alter, or operate a service station facility unless all required permits and approvals have been obtained from the authority having jurisdiction.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Required permits, licenses and regulatory authorizations for the service station facility are in place and are available on site.				
Plans, drawings and specifications of the system or equipment have been examined by the authority having jurisdiction.				
Guidance				
Refer to: International Fire Code, Version 1.0 (2006), section 105.6.				
Check office and site records for permits and regulatory authorizations.				
Check design documents, such as As-Built drawings, for inclusion of any specific environmental management structures.				
Check that permits and licenses are available on site.				
Check for documentation and reports that address limitations or conditions required by the permits, such as:				
<ul style="list-style-type: none"> • Annual monitoring programs for soil and water • Surface water management and release reports • Spill reports 				
Interview management regarding specific permit requirements, the documentation, training and reporting of these permit requirements.				

1.2 Site Security

Requirement				
Product storage tanks will have control of access to ensure product integrity.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Product storage access is controlled through appropriate use of tank locks.				
No smoking signs are clearly posted.				
Any fences are in good condition.				
Guidance				
Refer to: ARPEL Guideline #14 reference: REFIN 18.0 Access Control				
International Fire Code, Version 1.0 (2006), Section 2206.3				

1.3 Training

Requirement				
Service station operating personnel are trained and aware of the environmental impacts of their operations. Personnel understand the necessity for environmental planning and protection measures.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Personnel have taken environmental training in their field of operations and are clear on how to implement and use their training correctly.				
Persons responsible for the operation of areas in which hazardous materials are stored, dispensed, handled or used are familiar with the chemical nature of the materials and the appropriate mitigating actions necessary in the event of fire, leak or spill.				
Personnel update their training yearly, or as required by law.				
Environmental training manuals and reference programs are available.				
Operators have been trained in transportation safety and environmental protection.				
An employee involved with the transfer of petroleum products is trained in the correct operating procedures for all equipment and shut-down devices.				
Employees receive training in the contents of fire safety, spill response and evacuation plans and their duties as part of new employee orientation and at least annually thereafter.				
Training records are up-to-date.				
Guidance				
<p>Refer to: ARPEL Guideline #14 Reference : REFIN 2.0 Personnel Training International Fire Code, Version 1.0 (2006), Chapter 4 (Emergency Planning and Preparedness), Chapter 22 (Motor Fuel-Dispensing Facilities and Repair Garages)</p> <p>Check that training guidelines for each job exist. Check training records for personnel and ensure they are up to date. Confirm that personnel are trained for the environmental requirements of their job and as per the guidelines. For example:</p> <ul style="list-style-type: none"> • emergency response/spill containment training, • volume monitoring, • supervision of truck unloading, • transportation of dangerous goods guidelines, • current regulatory requirements and best operating procedures. <p>Identify the system by which personnel are reminded to update training – are records available? Check the reference library for manuals and guidelines. Check each department for appropriate training manuals. Interview managers and personnel regarding training schedules and funding.</p>				

1.4 Records

Requirement A comprehensive records management system is in place.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Version control is in place for procedures, manuals, guidelines, etc.				
Up to date engineering drawings are on file, including as-built drawings				
Records of tank installation and removal are available.				
Records of site inspections are available.				
Records are available of maintenance or repair performed in response to site inspections.				
Required test and inspection records are available to fire code officials at all times.				
Records are available covering: (a) inventory control and reconciliation (b) inspections and maintenance (c) cathodic protection monitoring (d) precision leak detection tests (f) maintenance and repairs; (g) monitoring well results; (h) construction, alterations, or upgrades; and, (i) as-built drawings.				
Guidance				
International Fire Code, Version 1.0 (2006), Section 107 (Administration) and Chapter 22 (Motor Fuel-Dispensing Facilities and Repair Garages)				

2.0 SPILL PREVENTION AND LEAK DETECTION

2.1 General Spill Prevention and Housekeeping

Requirement All sites shall be maintained properly and kept neat, clean and safe.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Site is kept neat, tidy and free from litter and waste.				
Weeds, grass, brush and other combustible materials are controlled within 3 m of fuel-handling equipment.				
General housekeeping is focused on reducing drips, spills, overflow or other loss.				
Areas where flammable or combustible liquids are dispensed are designed to accommodate accidental spillage.				
A reporting and documentation process exists in case of spills or leaking from tanks.				
Lighting is sufficient for operating procedures.				
Facilities and operations have equipment and procedures in place to prevent spillage or reduce impacts to the environment as a result of a spill.				
No container is filled with product at a facility unless the container is approved, in safe condition, and is not filled beyond its nominal capacity.				
A portable container is not filled while the container is in a vehicle, inside a trunk, or on the truck bed of a vehicle.				
Liquids spilled during dispensing operations are prevented from flowing into buildings by such means as grading and doorsills.				
The dispensing of fuel is conducted by, or under the supervision of, a qualified attendant.				
A hose nozzle is manually held open during transfer operations (hold-open devices are not used).				
The attendant gives immediate attention to accidental spills.				
Where possible, an automatic leak detection device, including a high-technology secondary containment monitoring device and precision line leak detection device, will be electrically interlocked in such a manner that: (a) when the automatic leak detection device is activated, product flow is shut off; and (b) except for on-site maintenance activities, when the automatic leak detection device is turned off or bypassed for more than one				

minute, product flow is terminated.				
A leak detection alarm is located where the staff routinely work and in a place where such alarms can be readily heard and seen.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 20.0 Housekeeping				
International Fire Code, Version 1.0 (2006), Section 107 (Administration) and Chapter 22 (Motor Fuel-Dispensing Facilities and Repair Garages)				
Housekeeping refers to the general maintenance of a site with respect to acceptable operating practices, upkeep maintenance and overall orderliness of the grounds, buildings and equipment.				

2.2 Inspection, Testing and Preventive Maintenance of Storage Tank Systems

Requirement				
Routine in-service inspections and maintenance are conducted. Underground storage tank systems are tested for leaks.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Regular visual inspections are completed to detect any visible leak or deterioration that may lead to a leak. Regular inspections occur either: (a) each day the facility is in operation; or (b) at a frequency specified by the authority having jurisdiction.				
A documented weekly visual inspection is done of the storage tank facility to ensure that there has not been a leak or equipment failure for: (a) pumps and product-handling equipment; (b) tank gauging equipment; (c) mechanical and automatic electronic leak detection equipment; (d) dispenser sumps and spill containment devices; and (e) overfill protection devices.				
Inspection and performance testing is completed at least annually, or in conformance with the manufacturer's requirements and procedures, to ensure satisfactory equipment performance and operation of a storage tank facility is conducted annually and documented by a company or individual that is authorized by the authority having jurisdiction for: (a) automatic tank gauges and monitoring systems; (b) electronic or mechanical leak detection equipment; (c) corrosion protection equipment; (d) pressurized piping emergency valves; (e) emergency shut-down devices;				

(f) containment sumps including dispenser, turbine and transition containment devices; and (h) overflow protection devices.				
The underground storage tank system is tested for leaks:				
- at the time of final installation (when final surface materials have been installed) and prior to being put into service; or				
- whenever a leak is suspected in the primary or secondary containment of the storage tanks, piping, containment sumps or related components.				
Guidance				
Refer to :				
International Fire Code, Version 1.0 (2006), Chapter 22 (Motor Fuel-Dispensing Facilities and Repair Garages)				
ARPEL Guideline # 14 REFIN 11.0 Tank Operations ARPEL Guideline #8, 2 nd Edition, Guideline for Control of Contamination from Underground Storage Tanks				
Suitable testing of underground storage tanks includes: internal inspection, hydrostatic leak tests, pneumatic leak tests, soil vapor and groundwater monitoring, or another method that provides the same level of confidence.				
Inspect any logbooks, records or incident reports.				

2.3 Inventory Control

Requirement				
The owner of a storage tank system conducts inventory control and reconciliation.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Accurate daily inventory records shall be maintained and reconciled on underground fuel storage tanks for indication of possible leakage from tanks and piping.				
The records are kept at the premises or made available for inspection by the authority having jurisdiction within 24 hours of a written or verbal request and include records for each product showing daily reconciliation between sales, use, receipts and inventory on hand.				
Where there is more than one system consisting of tanks serving separate pumps or dispensers for a product, the reconciliation is ascertained separately for each tank system.				
A consistent or accidental loss of product is immediately reported to the fire code official.				

<p>Guidance</p> <p>Refer to :</p> <p>International Fire Code, Version 1.0 (2006), Section 107 (Administration) and Chapter 22 (Motor Fuel-Dispensing Facilities and Repair Garages)</p> <p>ARPEL Guideline # 14 REFIN 11.0 Tank Operations</p> <p>ARPEL Guideline #8, 2nd Edition, Guideline for Control of Contamination from Underground Storage Tanks</p> <p>Suitable testing of underground storage tanks includes: internal inspection, hydrostatic leak tests, pneumatic leak tests, soil vapor and groundwater monitoring, or another method that provides the same level of confidence.</p> <p>Inspect any logbooks, records or incident reports.</p>

2.4 Product Delivery

<p>Requirement</p> <p>A person responsible for transferring petroleum product to a storage tank system must take all reasonable steps to prevent spills.</p>				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
The driver, operator, or attendant of a tank vehicle determines the available capacity of the tank using an approved gauging device.				
When a tank vehicle is being unloaded, the vehicle operator remains: (a) in constant view of the fill pipe; and (b) in constant attendance at the delivery control valve.				
No person transfers petroleum product to an underground storage tank unless a liquid- and vapor tight fill connection is made to the underground storage tank.				
<p>Guidance</p> <p>Refer to:</p> <p>International Fire Code, Version 1.0 (2006), Chapter 22 (Motor Fuel-Dispensing Facilities and Repair Garages)</p> <p>ARPEL Guideline #14: REFIN 10.0 Bulk Product Receipt and Delivery</p> <ul style="list-style-type: none"> • Determine hours trucks should be operating. • Through interviews, determine driver training effectiveness including training in transportation of dangerous goods, spill response, etc. • Inspect the loading areas to assess general housekeeping, control and cleanup of leaks and assess transfer operations which are in progress. 				

2.5 Signs and Labels

Requirement Signs and labels are required at the facility to provide information on procedures to prevent environmental damage.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Warning signs are conspicuously posted within sight of each dispenser in the fuel-dispensing area stating the following: 1. No smoking. 2. Shut off motor. 3. Discharge your static electricity before fueling by touching a metal surface away from the nozzle. 4. To prevent static charge, do not reenter your vehicle while gasoline is pumping. 5. If a fire starts, do not remove nozzle—back away immediately. 6. It is unlawful and dangerous to dispense gasoline into unapproved containers. 7. No filling of portable containers in or on a motor vehicle. Place container on ground before filling.				
An emergency procedures sign, in addition to the signs is posted in a conspicuous location and reads: IN CASE OF FIRE, SPILL OR RELEASE 1. USE EMERGENCY PUMP SHUTOFF 2. REPORT THE ACCIDENT! FIRE DEPARTMENT TELEPHONE NO. _____ FACILITY ADDRESS _____				
Emergency disconnect switches are distinctly labeled as 'EMERGENCY FUEL SHUTOFF'				
Dispenser operating instructions are conspicuously posted on every dispenser.				
Guidance				
Refer to: ARPEL Guideline # 14 reference: REFIN 12.0 Distribution Lines				
International Fire Code, Version 1.0 (2006), Chapter 22 (Motor Fuel-Dispensing Facilities and Repair Garages)				

3.0 EMERGENCY PREPAREDNESS AND SPILL RESPONSE

Requirement				
An Emergency Response Plan exists to protect the public, employees, the environment and property should an emergency occur. A comprehensive spill response plan is in place to limit impact to the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
An appropriate up-to-date emergency response/spill plan exists and is posted on-site.				
Personnel are familiar with the plan and their roles and responsibilities in spill response.				
Spill response training includes information on disposal of materials used to manage and contain the spilled material.				
Spill response kits are complete and easily accessible.				
Spill records are maintained, including location, volume, released chemical, response provided, recovery actions and any follow up.				
All material and equipment specified in the Emergency Response Plan is available on site.				
An emergency contact list is available on site.				
The owner or operator of a storage tank system immediately notifies the authority having jurisdiction and provides the information requested when the owner or operator discovers, suspects, or is notified by any person of: (a) any leak from a storage tank system; (b) any spill or overfill that is 100 L or more; or (c) any spill or overfill that could threaten fresh water supplies, groundwater, or the health and safety of the public.				
The owner of a storage tank system where a leak or spill is known or suspected does, in consultation with the authority having jurisdiction, take such actions as the authority having jurisdiction requires to verify, stop, clean up, and mitigate the impact of the leak or spill, including but not limited to: (a) isolating leaking components of the storage tank system; (b) arranging for immediate removal of the petroleum product from the isolated leaking components of the storage tank system; (c) inspecting the storage tank or piping and: (i) arranging for a leak test; or				

<p>(ii) removing the suspected leaking storage tank or piping; (d) taking all reasonable steps to establish the extent of the contamination (including vapors), contain the leaked or spilled petroleum product, and prevent its further migration; and (e) taking all reasonable steps to recover or remove escaped petroleum product.</p>				
<p>A readily-accessible emergency disconnect switch is provided to stop the transfer of fuel to the fuel dispensers in the event of a fuel spill or other emergency. The switch is located more than 6 m and less than 30 m from the fuel dispensers.</p>				
<p>Guidance</p>				
<p>Refer to: ARPEL Guideline # 14 REFIN 13.0 Product Storage; REFIN 33.0 Spill/Release Contingency Plans; REFIN 22.0 Release of Hydrocarbons; REFIN 32.0 Release/Spill Prevention,</p> <p>International Fire Code (2006), Chapter 4 (Emergency Planning and Preparedness)</p> <p>The contents of the spill emergency response contingency plan include the following information:</p> <ul style="list-style-type: none"> a The procedures for handling and investigating spill or leakage reports. b The procedure for alerting company personnel and affected outside parties. c A clear definition of the responsibilities of everyone involved. d Guidelines for reaction and control, including shut-down procedures, leak locations, leak isolation, spillage/release containment, watercourse protection, etc. e Guidelines for the protection of operating personnel and the general public.. f A telephone contacts summary. <p>Review any past incident reports. The review should include an assessment of the contingency plan and the response as well, assessing whether there should be any improvements made to the plan or the training provided.</p> <p>Spill records include the location and size of any spills, the environmental receptor (soil, surface water, marine water, etc.), measures taken to control and remediate the spill, and any volume recovered.</p>				

4.0 STORAGE TANKS

4.1 Aboveground Storage Tanks (ASTs)

Requirement				
Operation of aboveground tanks shall be carried out in a manner that does not cause damage to the environment. Tank operations include all work which is done in conjunction with tanks. Examples are gauging, loading and unloading of tanks and emergency containment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A shop-fabricated aboveground storage tank system:				
- has corrosion protection				
- has a secondary containment system				
- has leak detection				
- has containment sumps, as applicable				
- where a high-level alarm system is used, have audible and visual alarms located where personnel are constantly on duty during the product transfer operation and can promptly stop or divert delivery to the tank				
A horizontal storage tank is supported above grade level.				
Storage areas are clearly marked with signs and labeling on tanks.				
Aboveground tanks must be located within an impervious containment system sufficiently large to accommodate 100% of the largest tank volume. The capacity of the diked area must be calculated by deducting the volume of the tanks other than the largest tank (below the height of the dike).				
If any produced liquids enter the diked area, they must be collected and disposed of in an acceptable manner.				
Containment systems are maintained and monitored for leaks on a regular basis.				
Results of leak monitoring are documented and reported.				
Tanks are painted with a protective coating to prevent corrosion or rusting				
Periodic inspections of tanks, leak detection systems and dikes are conducted and results are recorded.				
Aboveground tanks are protected against impact from a motor vehicle.				
Where a tank is located in an area subject to buoyancy because of flooding, uplift protection is provided.				

Aboveground tanks are not filled in excess of 95% of their capacity.				
Operators are trained to incorporate measures to prevent the overfilling of tanks. These may include automatic shut-off devices, alarms or visual indicators.				
Guidance				
Refer to: ARPEL Guideline # 14 REFIN 11.0 Tank Operations; ARPEL Guideline #18, Guideline for Control of Contamination from Aboveground Storage Tanks				
International Fire Code (2006), Chapter 34 (Flammable and Combustible Liquids)				
<p>A leak detection system can include:</p> <ul style="list-style-type: none"> a A synthetic liner with a monitoring well. b Annual interstitial monitoring of double walled tanks. c Annual visual detection of vaulted tanks. d Monthly monitoring of weeping tile systems if the soil is of low permeability. 				
Special testing programs for tanks may include: 100% external inspection, internal inspection, hydrostatic leak tests, soil vapor and ground water monitoring or another method that provides the same level of confidence.				

4.2 Underground Storage Tanks (USTs)

4.2.1 Design and Installation

Requirement Design and installation of an underground storage tank system is in accordance with the manufacturer's instructions and the appropriate standards.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
An underground storage tank system is designed and installed to have:				
- double-wall tank(s) with monitorable interstitial space;				
- an overfill protection device;				
- a fill pipe spill containment device;				
- containment sumps, as applicable;				
- leak detection				
- except for venting purposes, liquid and vapor-tight connections, caps and adapters; and				
- corrosion protection, where applicable.				
A spill container having a capacity of not less than 19 L is provided for each fill connection.				
Installation of an underground storage tank system is completed by a company or individual that is authorized by the authority having jurisdiction.				
Where a tank is located in an area subject to buoyancy because of a rise in the water table, uplift protection is provided.				

An underground storage tank is located and maintained to permit the eventual removal of the storage tank when the storage tank system is taken out-of-service.				
As-built drawings for an underground storage tank system include, as a minimum: (a) the outline of all storage tanks; (c) the centerline of all piping or piping groups; (c) the centerline of all underground electrical power and monitor sensor conduit; (d) building foundation outlines; (e) secondary containment systems; and (f) property lines.				
Guidance				
Refer to : International Fire Code, Version 1.0 (2006), Chapter 34 (Flammable and Combustible Liquids) ARPEL Guideline # 14 REFIN 11.0 Tank Operations ARPEL Guideline #8, 2 nd Edition, Guideline for Control of Contamination from Underground Storage Tanks				

4.2.2 Piping Systems

Requirement				
Piping systems associated with storage tanks will be designed, installed, maintained and monitored to prevent impact to the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Where subject to external corrosion, piping, related fluid-handling components and supports for both underground and above-ground applications are fabricated from non-corrosive materials, and coated or provided with corrosion protection.				
Flexible joints are be installed on underground liquid, vapor and vent piping at all of the following locations: 1. Where piping connects to underground tanks. 2. Where piping ends at pump islands and vent risers. 3. At points where differential movement in the piping can occur. Fibreglass- reinforced plastic (FRP) piping is not required to be provided with flexible joints in locations where both of the following conditions are present: 1. Piping does not exceed 100 mm in				

diameter. 2. Piping has a straight run of not less than 1.2 m on one side of the connection when such connections result in a change of direction.				
Leak detection testing and monitoring of piping is carried out and reported.				
Piping located below the maximum product level in a tank is provided with a means to prevent the release of liquid from the tank by siphon flow.				
Piping is located and maintained to permit the eventual removal of the piping when the storage tank system is permanently withdrawn from service.				
Piping located aboveground is protected from physical damage due to impact.				
Guidance				
Refer to: International Fire Code, Version 1.0 (2006), Chapter 34 (Flammable and Combustible Liquids)				

5.0 FUEL DISPENSING STATIONS

Requirement				
Fuel dispensing stations are designed, operated, maintained and monitored to ensure protection of the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Dispensing equipment at a facility is installed on a pump island or support structure protected from vehicular impact.				
Dispenser hoses shall be a maximum of 5 m in length unless otherwise approved. When not in use, hoses shall be reeled, racked or otherwise protected from damage				
Where remote pumps are used to supply fuel dispensers, each pump has a leak detection device that will detect a leak in the piping and dispensers and provide an indication. A leak detection device is not required if the piping from the pump discharge to under the dispenser is above ground and visible.				
Only approved equipment is used to dispense product at a facility.				
Every portable container at a facility which contains product, is kept tightly closed when not in use and the contents of the container are legibly marked on the container.				
Combustible materials are stored for sale at least 3 m from the pumps or dispensers at a facility.				
Product is not dispensed or vented at a facility within 3 m of any source of ignition.				
Product is not dispensed into the fuel tank of a motor vehicle while the engine of the motor vehicle is running.				
Smoking is not permitted in a kiosk that is less than 3 m from any dispensing location.				
Absorbent material is provided for use by attendants at fuel dispensing stations to soak up liquid spillage.				
The attendant is able to communicate with persons in the dispensing area at all times.				
All packaged flammable and combustible liquid products stored or sold at a fuel dispensing station are in closed containers and distinctly marked with the generic name of the liquid they contain.				
Guidance				
Refer to:				
International Fire Code, Version 1.0 (2006), Chapter 22 (Motor Fuel-Dispensing Facilities and Repair Garages)				

6.0 LPG STORAGE

Requirement				
Storage, handling and transportation of liquefied petroleum gas (LP gas) is completed in a manner ensuring protection of the environment.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
The aggregate capacity of any one installation does not exceed a water capacity of 7570 L, or the requirements of the authority having jurisdiction.				
Containers are separated away from hazards such as aboveground tanks of flammable or combustible liquids, oxygen containers, and areas subject to flooding.				
Dispensing of LP gas is performed by a qualified attendant.				
Smoking is prohibited within 8 m of a point of transfer. 'No Smoking' signs are prominently displayed.				
Weeds, grass, brush, trash and other combustible materials are a minimum of 3 m away from LP gas containers.				
Containers are protected from exposure to damage by vehicles or other physical damage.				
Containers are stored within a suitable enclosure or otherwise protected against tampering, and are not subject to excessive temperature rise.				
Containers stored inside buildings are kept away from exit doors, stairways, or other areas normally used as a means of egress.				
Container valves are protected by screw-on-type caps or collars which are securely in place on all container stored, regardless of whether they are full, partly full, or empty.				
Guidance				
Refer to: International Fire Code, Version 1.0 (2006), Chapter 38 (Liquefied Petroleum Gases)				

7.0 GROUNDWATER AND SOIL MONITORING

7.1 Groundwater Monitoring Program

Requirement A groundwater monitoring program must be in place, to determine any on site contamination of groundwater, or possible off site movement.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A groundwater sampling and monitoring program is in place to meet the regulations or guidelines.				
The groundwater sampling monitoring program is designed and installed by a professional hydrogeologist or other person authorized by the authority having jurisdiction after assessing the site to establish the number and positioning of the monitoring wells				
Records of groundwater sampling and monitoring programs are available.				
Stakeholder consultation regarding programs and results is documented.				
Sampling protocols are in place and sampling personnel are trained in sampling techniques, including chain of custody requirements.				
Analytical protocols are appropriate for potential sources.				
Groundwater monitoring wells are decommissioned when no longer required.				
Groundwater conditions associated with leaking tanks and spills have been investigated.				
Where appropriate, groundwater investigation reports have been distributed to regulators.				
Where appropriate, remediation programs have been undertaken.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 28.0 Groundwater Monitoring				
Groundwater monitoring is a site specific issue. Wells should be installed hydraulically up gradient and down gradient of a potential contaminant. These wells will be used to determine the depth and direction of groundwater flow. Monitoring wells must be set in an area that will not interfere with everyday operations; however, they must be set in order to collect the required information.				

7.2 Groundwater Monitoring Wells

Requirement Groundwater monitoring wells are appropriately installed and maintained.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
When more than one monitoring well is necessary to monitor an installation				

effectively, the monitoring wells are numbered so that all monitoring and testing results can be easily correlated to a specific monitoring location.				
A monitoring well is equipped with a liquid-proof, lockable cap.				
A monitoring well is clearly distinguished from a fill pipe and marked with appropriate signage.				
Monitoring wells are secured to prevent unauthorized access and tampering.				
A monitoring well located in a traffic area is cut off at ground level and/or properly protected from vehicles.				
A damaged monitoring well is repaired or replaced within 30 days after discovery of the damage.				
Monitoring wells are checked for liquid product and/or vapors at least monthly, and records of inspections are kept.				
The product stored in a storage tank is immiscible in water and has a specific gravity of less than one.				
The hydraulic conductivity of the soil between a storage tank system and the monitoring wells is not be less than 0.01 cm/s.				
The monitoring wells intercept the excavation zone of an underground storage tank or be as close as technically possible.				
A monitoring well is a minimum of 50 mm in diameter.				
If a monitoring well is to be used as a recovery well, the screened zone extends at least 1.5 m into the water table and at least 1.5 m above the groundwater surface, as determined at the time of installation.				
The screened portion of a monitoring well is a minimum of 3.0 m in length and is factory slotted with a slot size of 0.25 mm or as approved by the authority having jurisdiction.				
The area around the screened portion of a monitoring well is surrounded by a filter pack.				
The filter pack extends to 0.5 m above the top of the screened portion of monitoring wells.				
The outside of a monitoring well is sealed from the ground surface to the top of the filter pack using bentonite, grout, or other material with equivalent performance.				
Where the groundwater surface is less than 2.5 m from the ground surface, a hydrogeologist or other person authorized by the authority having jurisdiction determines				

the length and position of: (a) the screened portion of a well; (b) the filter pack; and (c) the bentonite, grout, or other material with equivalent performance seal.				
A monitoring well is installed with a cap or plug at the bottom of the screened section of the well.				
Monitoring wells are constructed of flush joint, threaded, or bell and spigot Schedule 40 PVC or equivalent.				
A continuous monitoring device or a manual method are able to detect a minimum of 3 mm of free product on top of the groundwater surface in the monitoring well.				
Guidance				
Refer to: CCME 2003. Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and allied Petroleum Products. Access at http://www.ccme.ca/				

7.3 Soil Monitoring

Requirement				
Soil sampling and monitoring protocols are in place according to guidelines. Sampling programs and results are documented and documentation is retained.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Where appropriate, records of soil sampling and monitoring programs are available.				
Soil conditions associated with leaking tanks or spills have been investigated and reports are available for review.				
Where appropriate, soil investigation reports have been distributed to regulators.				
Where appropriate, soil remediation programs have been undertaken.				
Guidance				
Refer to: ARPEL Guideline #14 REFIN 27.0 Soil Sampling and Monitoring; ARPEL Environmental Guideline #37, Integrated Management of Wastes in Downstream Facilities, 2005.; ARPEL Environmental Guideline #3, Management of Petroleum Refinery Solid Waste. Soil monitoring activities may be completed to track the progress of a decontamination program, to determine the extent of a spill and develop remediation programs. Soil monitoring may be undertaken at any time of a facility's life, from pre-disturbance, during operations or during reclamation.				

7.4 Stormwater Management

Requirement				
Stormwater run-on and run-off must be controlled to minimize contamination of local water bodies.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
The facility complies with stormwater monitoring requirements				
Surface water control and release structures exist and are shut to prevent accidental				

release of runoff water				
If in use, perimeter berms are place appropriately to divert surface water run off from impacting (erosion, contamination, etc.) adjacent soil, water or wetlands.				
Guidance				
Refer to ARPEL Guideline #14, REFIN 26.0 Surface Water Monitoring ARPEL Guideline #14, REFIN 24.0 Drainage and Erosion				

8.0 WASTE MANAGEMENT

Requirement				
The disposal of waste materials shall be in compliance with applicable legislation. Verify that wastes are disposed of properly by assessing the components of a waste management program listed below.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
Wastes are managed by:				
a Minimizing the generation of wastes				
b Rendering hazardous wastes safe through destruction or treatment				
c Disposing in a secure manner when treatment is not feasible				
d Using technically-effective and cost-effective technologies				
Waste treatment and disposal choices have been made in consideration of: cost, local resources, legislation, and environmental impact.				
Information about the hazards and associated risks of hazardous wastes has been provided to employees, contractors, and other people on site.				
Incompatible wastes are not stored together.				
Waste containers are kept closed except when waste is being added or removed.				
Waste containers used are appropriate for the wastes they contain.				
Every waste container is labeled, stating the identity of the waste.				
Any materials spilled are contained and cleaned up.				
Waste disposal is carried out such that it does not attract wildlife.				
Guidance				
Refer to:				
Integrated Management of Wastes in Downstream Facilities, ARPEL Guideline #37.				

9.0 SITE DECOMMISSIONING

Requirement				
The withdrawal from service and removal of storage tank systems must be in conformance with the requirements of the authority having jurisdiction.				
Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
A storage tank system is removed by a company or individual that is authorized by the authority having jurisdiction.				
When a storage tank system has been permanently removed from service, the owner of a storage tank system ensures that: (a) petroleum products are removed and vapors purged from the storage tank, piping, dispensing, and transfer equipment; and (b) the storage tank, piping, dispensing, and transfer equipment are removed.				
If the site is contaminated with petroleum products, the site is remediated to the criteria defined by the authority having jurisdiction				
An underground storage tank system is not abandoned in-place.				
When a storage tank system is to be disposed of: (a) liquid petroleum product is removed from the storage tank system; (b) sludge in the storage tanks is removed and disposed of in a manner prescribed by the authority having jurisdiction; (c) the storage tank is purged of vapors;; (d) sufficient openings are be cut in the storage tank to render it unfit for further use;				
Guidance				
Refer to: International Fire Code, Version 1.0 (2006), Chapter 34, Flammable and Combustible Liquids				

APPENDIX E - ISO 14001 AUDIT PROTOCOL

Checklist for Conducting Environmental Audits ISO 14001:2004

**Prepared for:
Petroleum Corporation of Jamaica**

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1.0 ENVIRONMENTAL MANAGEMENT SYSTEMS – ISO 14001

1.1 General Requirements – ISO 14001

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.1-1 The organization shall establish, document, implement, maintain and continually improve an EMS in accordance with the requirements of this International Standard (ISO 14001:2004) and determine how it will fulfill these requirements.				
1.1-2 The organization shall define and document the scope of its EMS.				
Notes				

1.2 Environmental Policy

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.2-1 Top Management shall define the organization's environmental policy and ensure that, within the defined scope of its EMS, it:				
a is appropriate to the nature, scale and environmental impacts of its activities, products or services,				
b includes a commitment to continual improvement and prevention of pollution,				
c includes a commitment to comply with applicable legal requirements and with other requirements to which the organization subscribes which relate to its environmental aspects,				
d provides the framework for setting and reviewing environmental objectives and targets,				
e is documented, implemented and maintained,				
f is communicated to all persons working for or on behalf of the organization, and				
g is available to the public.				
Notes				

1.3 Planning

1.3.1 Environmental Aspects

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.3.1-1 The organization shall establish, implement and maintain a procedure(s)				
a to identify the environmental aspects of its activities, products or services within the defined scope of the EMS that it can control and those that it can influence taking into account planned or new development, or new or modified activities, products and services, and				
b to determine those aspects that have or can have significant impact(s) on the environment (i.e., significant environmental aspects).				
1.3.1-2 The organization shall document this information and keep it up to date.				
1.3.1-3 The organization shall ensure that the significant environmental aspects are taken into account in establishing, implementing and maintaining its EMS.				
Notes				

1.3.2 Legal and Other Requirements

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.3.2-1 The organization shall establish and maintain a procedure(s)				
a to identify and have access to the applicable legal requirements and other requirements to which the organization subscribes related to its environmental aspects, and				
b to determine how these requirements apply to its environmental aspects.				

1.3.2-2 The organization shall ensure that these applicable legal requirements and other requirements to which the organization subscribes are taken into account in establishing, implementing and maintaining it EMS.				
Notes				

1.3.3 Objectives, Targets and Programs

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.3.3-1 The organization shall establish, implement and maintain documented environmental objectives and targets, at relevant functions and levels within the organization.				
1.3.3-2 The objectives and targets shall be measurable, where practicable, and consistent with the environmental policy, including the commitments to prevention of pollution, to compliance with applicable legal requirements and with other requirements to which the organization subscribes, and to continual improvement.				
1.3.3-3 When establishing and reviewing its objectives and targets, an organization shall take into account the legal and other requirements to which the organization subscribes, and its significant environmental aspects. It shall also consider its technological options, its financial, operational and business requirements, and the views of interested parties.				
1.3.3-4 The organization shall establish, implement and maintain a program(s) for achieving its objectives targets. Program(s) shall include				
a designation of responsibility for achieving objectives and targets at relevant functions and level of the organization, and				

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
b the means and time-frame by which they are to be achieved.				
Notes				

1.4 Implementation and Operation

1.4.1 Resources, Roles, Responsibility and Authority

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.4.1-1 Management shall ensure the availability of resources essential to establish, implement, maintain and improve the environmental management system. Resources include human resources and specialized skills, organizational infrastructure, technology and financial resources.				
1.4.1-2 Roles, responsibilities and authorities shall be defined, documented and communicated in order to facilitate effective environmental management.				
1.4.1-3 The organization's top management shall appoint a specific management representative(s) who, irrespective of other responsibilities, shall have defined roles, responsibilities and authority for				
a ensuring that an EMS is established, implemented and maintained in accordance with this International Standard (i.e., ISO 14001),				
b reporting to top management on the performance of the EMS for review, including recommendations.				
Notes				

1.4.2 Competence, Training and Awareness

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.4.2-1 The organization shall ensure that any person(s) performing tasks for it or on its behalf that have the potential to cause a significant environmental impact(s) identified by the organization is (are) competent on the basis of appropriate education, training or experience, and shall retain associated records.				
1.4.2-2 The organization shall identify training needs associated with its environmental aspects and its EMS. It shall provide training or take other action to meet these needs, and shall retain associated records.				
1.4.2-3 The organization shall establish, implement and maintain a procedure(s) to make persons working for it or on its behalf aware of				
a the importance of conformance with the environmental policy and procedures and with the requirements of the EMS,				
b the significant environmental aspects and related actual or potential impacts associated with their work, and the environmental benefits of improved personal performance,				
c their roles and responsibilities in achieving conformity with the requirements of the EMS, and				
d the potential consequences of departure from specified procedures.				
Notes				

1.4.3 Communication

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.4.3-1 With regard to its environmental aspects and EMS, the organization shall establish, implement and maintain a procedure(s) for				
a internal communication between the various levels and functions of the organization,				
b receiving, documenting and responding to relevant communication from external interested parties.				
1.4.3-2 The organization shall decide whether to communicate externally about its significant environmental aspects, and shall document its decision. If the decision is to communicate, the organization shall establish and implement a method(s) for this external documentation.				
Notes				

1.4.4 Documentation

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.4.4-1 The EMS documentation shall include				
a the environmental policy, objectives and targets,				
b description of the scope of the EMS,				
c description of the main elements of the EMS and their interaction, and reference to related documents,				
d documents, including records, required by this International Standard (i.e., ISO 14001), and				
e documents, including records, determined by the organization to be necessary to ensure the effective planning, operation and control of processes that relate to its significant environmental aspects.				
Notes				

1.4.5 Control of Documents

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.4.5-1 Documents required by the EMS and by this International Standard (i.e., ISO 14001) shall be controlled. Records are a special type of document and shall be controlled in accordance with the requirements given in 4.5.4.				
1.4.5-2 The organization shall establish, implement and maintain a procedure(s) to				
a approve documents for adequacy prior to issue,				
b review and update as necessary and re-approve documents,				
c ensure that changes and the current revision status of documents are identified,				
d ensure that relevant versions of applicable documents are available at points of use,				
e ensure that documents remain legible and readily identifiable,				
f ensure that documents of external origin determined by the organization to be necessary for the planning and operation of the EMS are identified and their distribution controlled, and				
g prevent the unintended use of obsolete documents and to apply suitable identification to them if they are retained for any purpose.				
Notes				

1.4.6 Operational Control

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.4.6-1 The organization shall identify and plan those operations that are associated with the identified significant environmental aspects consistent with its environmental policy, objectives and targets, in order to ensure that they are carried out under specified conditions, by				
a establishing, implementing and maintaining a documented procedure(s) to control situations where their absence could lead to deviation from the environmental policy, objectives and targets,				
b stipulating the operating criteria in the procedure(s), and				
c establishing, implementing and maintaining procedures related to the identified significant environmental aspects of goods and services used by the organization and communicating applicable procedures and requirements to suppliers, including contractors.				
Notes				

1.4.7 Emergency Preparedness and Response

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.4.7-1 The organization shall establish, implement and maintain a procedure(s) to identify potential emergency situations and potential accidents that can have an impact(s) on the environment and how it will respond to them.				
1.4.7-2 The organization shall respond to actual emergency situations and accidents and prevent or mitigate associated environmental impacts.				
1.4.7-3 The organization shall periodically review and, where necessary, revise it emergency preparedness and response procedures, in particular, after the occurrence of accidents or emergency situations.				
1.4.7-4 The organization shall also periodically test such procedures where practicable.				
Notes				

1.5 Checking

1.5.1 Monitoring and Measurement

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.5.1-1 The organization shall establish, implement and maintain a procedure(s) to monitor and measure, on a regular basis, the key characteristics of its operations that can have a significant environmental impact. The procedure(s) shall include the documenting of information to monitor performance, applicable operational controls and conformity with the organization's environmental objectives and targets.				
1.5.1-2 The organization shall ensure that calibrated or verified monitoring and measurement equipment is used and maintained and shall retain associated records.				
Notes				

1.5.2 Evaluation of Compliance

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.5.2-1 Consistent with its commitment to compliance, the organization shall establish, implement and maintain a procedure(s) for periodically evaluating compliance with applicable legal requirements.				
1.5.2-2 The organization shall keep records of the results of the periodic evaluations.				
1.5.2-3 The organization shall evaluate compliance with other requirements to which it subscribes. The organization may wish to combine this evaluation with the evaluation of legal compliance referred to in 4.5.2.1 or to establish a separate procedure(s).				
1.5.2-4 The organization shall keep records of the results of the periodic evaluations.				
Notes				

1.5.3 Nonconformity, Corrective Action and Preventive Action

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.5.3-1 The organization shall establish, implement and maintain a procedure(s) for dealing with actual and potential nonconformity(ies) and for taking corrective action and preventive action. The procedure(s) shall define requirements for				
a identifying and correcting nonconformity(ies) and taking action(s) to mitigate their environmental impacts,				
b investigating nonconformity(ies), determining their cause(s) and taking actions in order to avoid their recurrence,				
c evaluating the need for action(s) to prevent nonconformity(ies) and implementing appropriate actions designed to avoid their occurrence,				

d recording the results of corrective action(s) and preventive action(s) taken, and				
e reviewing the effectiveness of corrective action(s) and preventive action(s) taken.				
1.5.3-2 Actions taken shall be appropriate to the magnitude of the problems and the environmental impacts encountered.				
1.5.3-3 The organization shall ensure that any necessary changes are made to EMS documentation.				
Notes				

1.5.4 Control of Records

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.5.4-1 The organization shall establish and maintain records as necessary to demonstrate conformity to the requirements of its environmental management system and of this International Standard, and the results achieved.				
1.5.4-2 The organization shall establish, implement and maintain a procedure(s) for the identification, storage, protection, retrieval, retention and disposal of records.				
1.5.4-3 Records shall be and remain legible, identifiable and traceable.				
Notes				

1.5.5 Internal Audit

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.5.5-1 The organization shall ensure that internal audits of the environmental management system are conducted at planned intervals to				
a determine whether the environmental management system <ol style="list-style-type: none"> 1. conforms to planned arrangements for environmental management including the requirements of this International Standard (i.e., ISO 14001), and 2. has been properly implemented and is maintained, and 				
b provide information on the results of the audit to management.				
1.5.5-2 Audit program(s) shall be planned, established, implemented and maintained by the organization, taking into consideration the environmental importance of the operation(s) concerned and the results of previous audits.				
1.5.5-3 Audit procedure(s) shall be established, implemented and maintained that address <ul style="list-style-type: none"> • the responsibilities and requirements for planning and conducting audits, reporting results and retaining associated records, • the determination of audit criteria, scope, frequency and methods. 				
1.5.5-4 Selection of auditors and conduct of audits shall ensure objectivity and the impartiality of the audit process.				
Notes				

1.6 Management Review

Specific Requirement	Finding			
	Satisfactory	Not Satisfactory	No Information	Not Applicable
1.6-1 Top management shall review the organization's environmental management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness. Reviews shall include assessing opportunities for improvement and the need for changes to the EMS, including the environmental policy and environmental objectives and targets. Records of the management reviews shall be retained.				
1.6-2 Input to management reviews shall include				
a results of internal audits and evaluations of compliance with legal requirements and with other requirements to which the organization subscribes,				
b communication(s) from external interested parties, including complaints,				
c the environmental performance of the organization,				
d the extent to which objectives and targets have been met,				
e status of corrective and preventive actions,				
f follow-up actions from previous management reviews,				
g changing circumstances, including developments in legal and other requirements related to its environmental aspects, and				
h recommendations for improvement.				
1.6-3 The outputs from management reviews shall include any decisions and actions related to possible changes to environmental policy, objectives, targets and other elements of the EMS, consistent with the commitment to continual improvement.				
Notes				

ARPEL

Regional Association of Oil and Natural Gas Companies in Latin America and the Caribbean

Established in 1965, ARPEL is an association of 27 state owned and private oil and gas companies and institutions with operations in Latin America and the Caribbean, which represent more than 90 percent of the Region's upstream and downstream operations. Since 1976, ARPEL holds formal UN-ECOSOC special consultative status.

ARPEL works together with its members –through its various Committees and Working Groups- on issues that contribute to sustainable development in the Region:

- *Economic issues:* regional energy integration, pipelines and terminals, downstream and fuels
- *Environmental issues:* climate change, atmospheric emissions, oil spill contingency plans and best practices in environment and occupational health and safety management.
- *Social issues:* corporate social responsibility and relations with indigenous peoples

ARPEL develops a proactive attitude on issues of interest to the industry and produces documents representing the views of its members. It also promotes interaction among its members and with governments building alliances and establishing agreements with international organizations with the aim of presenting and developing a regional perspective. To accomplish its objectives, ARPEL organizes regional workshops and symposia to share information and best practices and develops technical documentation for capacity building and information exchange on the issues of interest to its members. To support its management ARPEL has an interactive Portal in which all documents developed by ARPEL Technical Committees and Working Groups are available for its Members. This tool also facilitates the virtual interaction within the ARPEL community and with those stakeholders that interrelate with it.



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