
**Archaeology Audit Program Final Report |
April | 2009**

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1 Executive Summary

In April 2008, the Oil and Gas Commission (Commission) introduced its Archaeology Audit Program (AAP) to review oil and gas companies' archaeological management systems. Twenty six oil and gas companies were selected for an office documentation review and a corresponding field audit. The audit results are described within this document. The oil and gas companies subject to audit were found to have met or exceeded OGC expectations for maintaining archaeological management systems.

Following an overview of the AAP scope and methodology, the AAP Final Audit Report provides examples from the audit of both good management practices encountered and practices in which opportunities for improvement to archaeological management systems could be implemented. Recommendations to address improvement opportunities are also discussed.

The Final Audit Report is intended to provide information to assist oil and gas companies to improve their management systems by increasing the emphasis of the preservation of cultural resources. Future audits will look at those management systems to determine whether or not recommendations have been incorporated.

2 Background and Scope

In 2004, the OGC introduced a shift towards a performance-based approach to archaeological management systems, placing responsibility and accountability for complying with policy and legislation such as the *Heritage Conservation Act (HCA)* on oil and gas industry applicants. The performance-based system is described in the *BC Oil and Gas Commission Guidelines for the Performance-Based Approach to Archaeological Assessments (Guidelines)*, which provides guidance and instruction to companies applying to develop oil and gas resources in British Columbia. The AAP is a key component of the *Guidelines*.

The AAP is not a compliance audit, but is an examination of archaeological management systems developed by oil and gas industry applicants. This audit is an opportunity for oil and gas companies to identify any weaknesses in their management systems and develop improved management practices and efficiency. The audit consisted of interviews, field investigations and documentation review, aimed to:

- verify that oil and gas companies have appropriate management systems and controls to ensure operations comply with requirements of legislation regarding archaeological resources;
- assess the degree of compliance with such legal requirements; and,



- measure oil and gas companies' management practices against relevant good management practices.

This audit is a systematic process relying on the principles of independence and objectivity. Specifically, the following principles guide the conduct of this audit and the presentation of audit results:

- Auditors shall act in an ethical manner and make decisions applying due professional care based on evidence obtained during the audit. Auditors will not act outside of their areas of competence and knowledge.
- Auditors will be impartial and independent of the activity that they are auditing, and act without bias or prejudice.
- Confidential information reviewed or obtained in the audit will be held in confidence by the auditors and only included in the audit report where the information is relevant to an audit finding.
- Audit results will be presented in a fair and accurate manner, and will truthfully reflect the audit activity and evidence.

3 Audit Objectives

The AAP has two primary objectives:

- To verify that oil and gas companies developing resources in British Columbia have appropriate controls in place to ensure that their operations are in compliance with relevant legal and other requirements; and,
- To assess the degree of conformance with legislation, guidelines, conditions and other requirements that apply to oil and gas companies operating in British Columbia.

While the AAP is not a compliance audit, it is the duty of the audit team to notify OGC enforcement staff of any breaches in legislation or policy, as outlined in section 1.5 of the *Guidelines*.

The information obtained from this audit was used to:

- determine if objectives can be achieved more effectively and efficiently;
- establish baseline data both for the auditee and the industry as a whole;
- identify innovative management practices.

The overall objective of the performance-based approach in general and the AAP in particular is the protection and conservation of the archaeological resources of British Columbia.

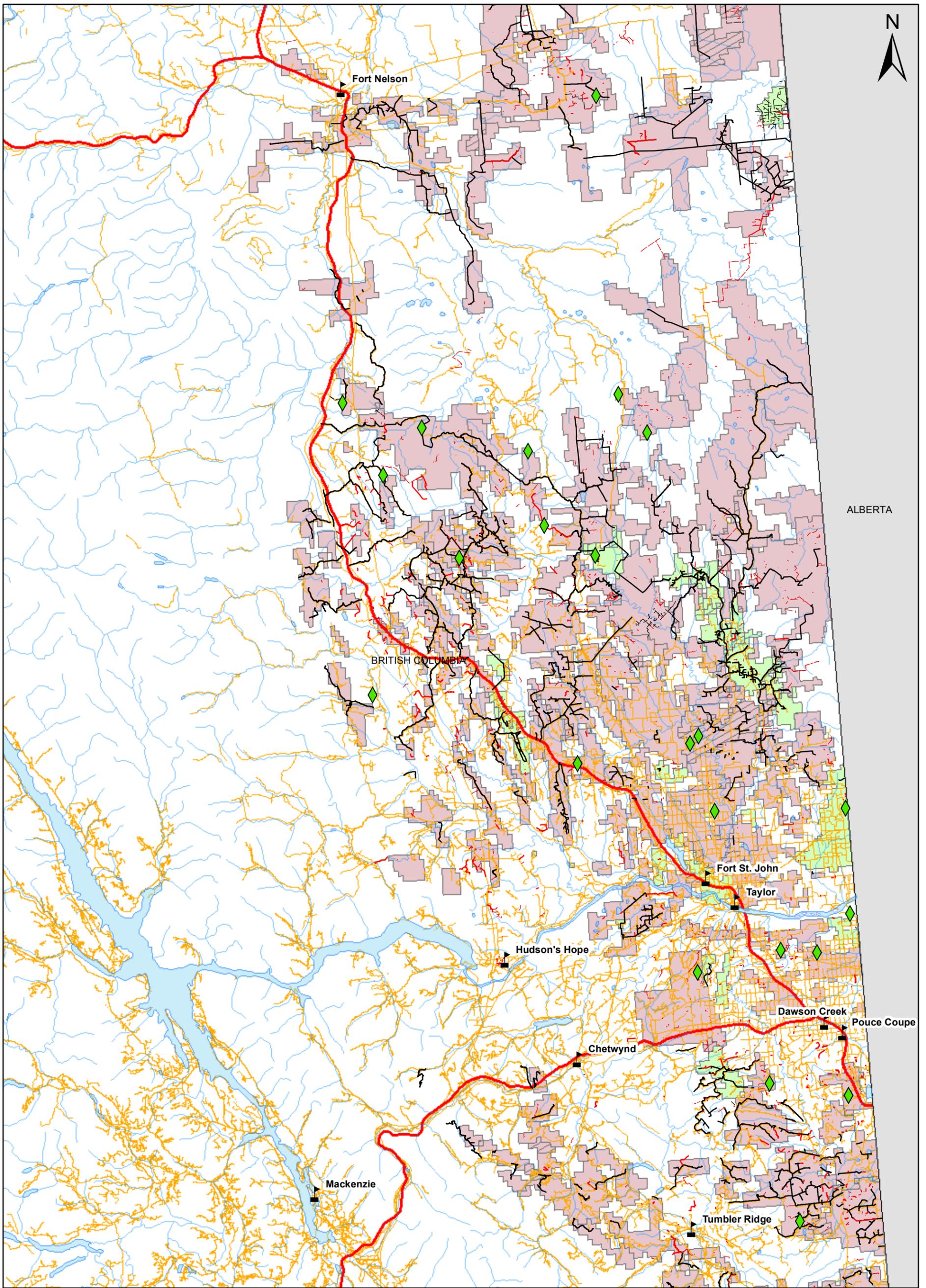
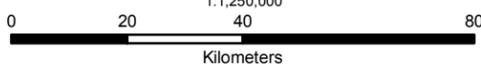


Figure 1: Archaeology Audit Program Field Audit Locations



Albers, NAD 1983
Produced by the Oil and Gas Commission October 15, 2008

1:1,250,000



File Path: \\arcprg\PROJECTS\IP62\Maps\Archaeology_AudR_11x17.mxd
Map is for representation purposes only. The Oil and Gas Commission assumes neither responsibility for inconsistencies or inaccuracies in the data nor liability for any damages of any type arising from errors or omissions.

- Field Audit Site
- Stream/River
- Lake
- Highway
- Road
- Gas
- Oil
- Overlap
- Petroleum Access Road**
- HIGH
- LOW/WINTER
- Petroleum Development Road**
- HIGH
- LOW/WINTER

4 Audit Scope and Methodology

The intent of the sampling methodology was to arrive at a random sampling of applicants, with the probability of selection being related to the number of projects applied for that year. Future AAPs will incorporate past audit selection and results into the selection process to focus audit resources on applicants that have not previously been audited and to exempt applicants that have had excellent audit results within the previous several years.

The approvals issued by the Commission in 2007 were divided into geophysical and non-geophysical groups:

- 2194 unique non-geophysical projects approved in 2007, from a total of 102 applicants; and,
- 65 unique geophysical projects were approved in 2007, from a total of 29 applicants.

The sample populations were randomized, and 20 per cent of applicants from each sample population were drawn for audit. For each non-geophysical company, a sample of 25 per cent of approved projects (to a maximum of five projects) was selected for audit; for each geophysical company, a sample of 50 per cent of that applicant's projects (to a maximum of five projects) was selected for audit.

Twenty six oil and gas companies were randomly selected for the 2008 AAP, of which 20 were selected for non-geophysical modules and six were chosen for geophysical modules. Eighty-eight unique developments were selected for the project specific component of the audit, and 23 developments were selected for field inspection. Developments selected for field audit were selected based on risk of impact to archaeological resources, and efforts were made to select projects representing the full extent of oil and gas related development in northeastern B.C.

Figure 1 illustrates the geographic extent of the field inspections conducted in the 2008 AAP.

The 2008 AAP was comprised of several modules, designed to act as a tool to identify and measure the gaps between the recommended approach and the approach used by the applicant companies. These modules are composed of specific questions for geophysical and non-geophysical projects. Details regarding module specifics are outlined in Table 1.

Table 1: Module Protocols

Module Type	Objective	Protocol
General Management System Questions	To ensure that applicants have adequate management and control systems.	Required to be answered once by applicant/operator during AAP
Archaeological Site Mitigation Questions	To ensure practices and procedures are established to properly address archaeological resources found.	Required to be answered once by applicant/operator during AAP
Project Specific Questions	To ensure required documentation exists on file.	Will be required for every project selected.
Field Specific/Field Related Questions	To ensure management and control systems are employed.	Selected during the audit process, either concurrently or after completion of the documentation and management system reviews.

General management system and archaeological site mitigation questions were required to be answered once by each company selected for audit. These questions address the management and control systems employed by applicants/operators to determine if they are appropriately established to ensure compliance with the HCA. These questions addressed the management system only and do not investigate specific files.

Project-specific questions, consisting largely of documentation review, were answered for every project selected for audit. These questions provided evidence ensuring that general and archaeological site mitigation management systems are used in practice. Field-specific questions provided practicable evidence regarding the management and control systems employed by audited companies.



Figure 2: Aerial view of archaeological site during audit.

5 GMP Determination Criteria

The AAP consists of four modules, used as tools to identify and measure any gaps between the approach used by oil and gas applicants and recommended practices identified by the Commission’s archaeology staff. Audit findings have been characterized according to four categories:

Table 2: Findings Categorization

Finding Category	Description
Good Management Practice (GMP)	Process or practice is considered to be beyond the required process or practice
Satisfactory (S)	Practices are sufficient to deliver compliance with legal and other requirements
Opportunity for Improvement (OI)	Describes an area of potential improvement in management practices or potential weakness in the implementation of controls, such that the auditee may continue to improve their system and their performance
Non-Conformance (NC)	Specific legal or other requirement is not met, or where the ability of the company to comply with legal or other requirements is jeopardized
Not Applicable (N/A)	Describes a situation in which the question is not answerable in this specific situation

Findings not categorized as ‘GMP’ or ‘S’ will include an identification of the weakness or failure of the management system or control that resulted in the negative finding.

6 Audit Findings

Audit findings were separated into the following four categories for discussion purposes:

- Company accountability;
- Communication, training and project tracking;
- Legislative and regulatory understanding; and,
- Planning.



Figure 3: Commission staff member Vera Brandzin conducting a field audit.

Within each of these subsections, examples of exemplary and innovative practices currently in use by oil and gas companies in northeast British Columbia are described. Specific opportunities for improvement identified during the office documentation review and subsequent field audit are also discussed. Where an opportunity for improvement was identified, a discussion of improvement is given beneath in italics.

6.1 Company Accountability

Under the OGC's performance-based approach to archaeology, oil and gas clients are responsible for maintaining management systems that ensure compliance with archaeological requirements. Therefore, the oil and gas company is ultimately accountable for ensuring all regulatory and legislative requirements are met, and for ensuring that development activities do not damage archaeological resources.

6.1.1 Good Management Practices

- The construction supervisor on a geophysical program conducts field visits both before and after construction to ensure that archaeological sites have been properly flagged for avoidance and have not inadvertently been impacted by construction, often accompanying the archaeological consultants in the field.
- When mitigation measures are in place to avoid impacting an archaeological site, a field inspection is conducted after construction to ensure that construction crews have followed recommendations and that the site is protected.

6.1.2 Opportunities for Improvement

- On one development, an Archaeological Assessment Information Form (AAIF) was submitted indicating that a 40m review corridor was assessed around the development area, and this review corridor was shown on the construction plans. However, there was no indication on the accompanying Archaeological Impact Assessment (AIA) report of the review corridor being subject to an assessment.

- *When an application utilizes a review corridor, oil and gas company representatives are responsible for ensuring that documentation indicates all components were subject to review and that documentation is complete and accurate so that informed decisions can be made regarding preservation of archaeological resources.*
- Three archaeological sites were identified during the archaeological impact assessment of a wellsite, and the archaeological consultant proposed an access reroute avoiding these sites. However, the construction plans show the remote sump and decking sites adjacent to this reroute located within an area which, according to the AIA report, was not subject to an archaeological assessment.



Figure 4: Vera Brandzin inspecting the flagging around an archaeological site.

Oil and gas company representatives are responsible for ensuring that all components proposed for construction have been subject to an archaeological assessment.

- An archaeological site was identified within the originally proposed location of a borrow pit. The AIA report states that the company agreed to relocate this borrow pit to the south, referring to the report map. This map shows the borrow pit located approximately 35 m south of the site. This is the document that the OGC archaeology staff reviewed prior to approving mitigation.

During field inspection, auditors noted that the borrow pit was located only a few metres south of the site boundary. Although the site, as delineated by the archaeological consultant, was not directly impacted, substantial impact may have been caused to the associated terrain feature. This may affect long-term stability of the site. It is likely that the Commission would not have approved this mitigation had it shown the site being avoided by only a few metres, as there is possibility for future erosion to impact the site.

When an archaeological site is in conflict with development, all parties must understand and concur with proposed mitigation measures. The oil and gas company representative should be responsible for coordinating communication regarding the implementation of mitigation

strategies. If the mitigation strategy approved by the Commission's archaeology staff is not practicable, any proposed changes must be reviewed and approved by Commission archaeology staff.

6.2 Communication, Training and Project Tracking

Maintaining an effective archaeological management system requires that information be tracked and communicated effectively at each stage of development. Tracking systems can vary from sophisticated workflow diagrams to relatively simple databases, but should minimally outline process and requirements, and record the status of these requirements.

Similarly, a communication record should be kept by all parties involved in the management system, recording dates and summaries of conversations. This record often proves a valuable resource if problems are encountered at a later date. Companies must also ensure that information is presented in a timely and understandable manner to appropriate parties, including field crews. This knowledge helps protect archaeological resources, and indicates to all staff that archaeological values were incorporated into the planning process.

6.2.1 Good Management Practices

- The oil and gas company makes use of an internal tracking database, as well as a guiding checklist and multi-level workflow documents, to track project status, regulatory requirements, submission dates and approvals. This system is backed up by systems maintained by the local field staff and third party contractors.
- The oil and gas companies' surface land staff works closely with archaeological consultants to mitigate impact to archaeological resources, and when necessary, to collaboratively develop solutions during planning stages.
- Archaeological sites flagged for avoidance have "No Access" signs posted in the area warning crews working in the area, and are marked as hazards on project maps.
- A communication log recording dates and summarizing the discussion amongst agents, company representatives and archaeological consultants is maintained.



Figure 5: Aerial overview of well site subject to audit.

- The surveyor/construction supervisor stays on site and oversees construction in areas near known archaeological sites, and verbally reports to applicable management personnel that mitigation strategies to avoid damaging archaeological sites in potential conflict with the development were effective.
- The oil and gas company holds both large-scale safety meetings and smaller, site-specific pre-construction meetings addressing specific issues, including mitigation of impact to archaeological sites. These meetings are attended by operations management and construction supervisors.
- Training provided to office staff, field crews and contractors, including company policies and procedures, a PowerPoint presentation presenting archaeological issues and a Frequently Asked Questions document prepared by the archaeological consultant.

6.2.2 Opportunities for Improvement

- Field inspection interviews revealed that the construction foreman was not aware an archaeological site was in conflict with the pipeline until the pre-construction meeting took place. The construction foreman was unsure if an archaeological assessment had been conducted on the development, and was not aware of the potential penalties for damaging an archaeological site.

The oil and gas company should have a process in place to make certain that such information is provided to, and understood by, construction staff.

6.3 Understanding Legislative and Regulatory Requirements

The AAP revealed that not all oil and gas company staff is aware of processes and procedures regulated by the Commission. While some smaller companies rely on local land companies to act on their behalf, it is important that all companies operating in B.C. have a basic understanding of regulatory processes, and that they are aware of the work their consultants are conducting. Ultimately, responsibility for the work of consultants submitted on behalf of their clients will rest with the oil and gas company.

6.3.1 Good Management Practices

- The auditee developed an archaeological assessment procedures document describing how archaeological management is incorporated into the planning process, and the policies and procedures involved in meeting legislative and regulatory requirements as well as in protecting archaeological resources.

6.3.2 Opportunities for Improvement

- The oil and gas company did not keep copies of the appropriate archaeological *Heritage Conservation Act*, Section 14 permit and signed client certification page in the main office.

Copies of the archaeological consultant's heritage inspection permit and signed client certification should be kept on file by their client, and the duties, requirements and roles outlined therein should be reviewed and discussed with the archaeological consultant.

- The oil and gas company was relying on the archaeological consultant to submit their documentation in order to fulfill regulatory requirements.

Ensure that the oil and gas company's responsibility for reviewing and submitting all archaeological documentation as outlined in the Guidelines, including any archaeological assessment reports, is clearly understood by company staff.

6.4 Planning

The importance of planning in maintaining an archaeological management system cannot be underestimated. Outlining and understanding expectations, strategies, processes and requirements for both the short and long terms is a valuable tool in developing oil and gas resources in BC. Building archaeological values into the planning process will help companies to preserve archaeological resources, as well as meet regulatory and legislative requirements in a timely and cost-effective manner.



Figure 6: View of archaeological site from winter access.

6.4.1 Good Management Practices

- Conducting the Selective Post Impact Archaeological Assessment, if required, within six months of the geophysical program taking place, as well as assessing the degree of ground disturbance immediately after program completion. If the program is completed in the spring or summer, the assessment is conducted at the same time as re-inspection.
- Conducting the archaeological impact assessment at the time of initial survey, ensuring that any archaeological concerns are addressed in the planning stages of a development.

- Instituting a policy that construction packages are not released to the construction supervisor until all legislative and regulatory requirements and documentation have been collected.

6.4.2 Opportunities for Improvement

- Construction staff was not aware of what to do if archaeological resources, including burials, were disturbed.

Develop a policy clearly outlining procedures surrounding the accidental disturbance of archaeological resources, including burials.

- Not all archaeological sites that were potentially in conflict were flagged for avoidance prior to construction beginning, with the flagging taking place as construction approached the area in question. Once flagging began, it was discovered that the archaeological sites were initially plotted incorrectly and construction activities took place in the vicinity of the sites; the error was discovered before the archaeological sites were damaged.

Ensure all known archaeological sites that are potentially in conflict with construction activities are flagged prior to construction commencing.

- The AIA report submitted for the application showed an archaeological site located approximately four metres from the northeast border of the lease. The site was flagged for avoidance by the archaeological consultant.

During the field inspection, auditors observed that flagged trees used to demarcate the site boundaries nearest the lease were cut down. The construction supervisor stated that the trees were cut down for safety reasons, but their removal could potentially impact the mitigation strategy utilized by the oil and gas company to avoid impacting the archaeological site.

The oil and gas company should review proposed mitigation strategies as soon as they are made, considering the practicality and efficiency of the proposal, and work collaboratively with the archaeological consultant to develop an alternative plan if required.

6.5 Discussion of Audit Findings

The 2008 AAP found that each of the oil and gas companies subject to audit maintained archaeological systems that met Commission expectations. All findings were assigned a rating according to Table 2. These rated findings were used to evaluate the overall archaeological management systems in use by the auditees:

- Twenty two companies maintained archaeological management systems that met OGC expectations; and,
- Four companies maintained archaeological management systems that exceeded OGC expectations.



Figure 7: View of well site subject to audit.

The audit also revealed that, as a result of selection for participation in the audit, some companies began review of their archaeological management systems in anticipation of Commission examination, and developed improvements on their own initiative. For example, one company suggested photographing construction activities in the vicinity of archaeological sites, while another is developing a process ensuring that mitigation strategies are clearly conveyed to survey and construction staff.

7 Recommendations and Conclusions

The results from the 2008 AAP were positive, with a number of GMPs identified through the audit process. These practices demonstrate that incorporating archaeological values into the planning process is a cost effective and efficient means of ensuring that Commission application and construction processes proceed smoothly.

In the spirit of continual improvement to business practices, the Commission suggests that oil and gas companies review recommendations for improvements to archaeological management systems provided in this report, including the following:

1. Develop a written archaeological management plan, formalizing standard operating procedures already in use, and addressing relevant legislative and regulatory requirements. At minimum, the information in this plan should include processes for ensuring the completion of archaeological assessments and the timely submission of archaeological reports. Please refer to the *Oil and Gas Commission Guidelines for Performance-Based*

Approach to Archaeological Assessments for guidance in the creation of an archaeological management plan. The plan could encompass both high level planning strategies, as well as procedures for specific tasks.

All staff, contractors and land agents should be familiar with the contents of a management plan, as specific information about procedures and policies could help ensure archaeological resources are protected.

2. Create or refine existing tracking systems so that information about regulatory and legislative requirements, including status and relevant dates, can be easily tracked and retrieved for easy reference.
3. Develop strategies to ensure that information about mitigation strategies are clearly communicated by the archaeological consultants to both land and field staff. Developing collaborative working relationships fosters increased understanding and respect for archaeological resources, as well as comfort levels for discussing the feasibility of proposed mitigation measures.
4. Develop a communication record, summarizing dates and information. This can constitute a valuable source of information in future, and helps ensure that important data is clearly communicated.
5. The oil and gas company should appoint one person as the primary contact for archaeological resources, assuming responsibility for ensuring that resources are protected, information and training is provided for all staff, consultants and contractors, and to ensure that all requirements are met. This person should also be responsible for ensuring that all development components have been subject to an archaeological assessment as required, and that the associated reports and forms accurately reflect results.

The AAP will be reviewed internally. Processes and procedures used throughout the 2008 audit will be reviewed, particularly in terms of scheduling audit activities. Audit questions will be closely reviewed and revised to address opportunities for improvement in archaeological management systems identified through both the audit results and knowledge acquired through regular Commission regulatory activities. Such information allows for more thorough analysis of management systems, inevitably leading to learning opportunities for both the Commission and oil and gas companies.