Ministry of Sustainable Resource Management

Business Strategy and Transition Plan

Integrated Registry Project

October 31, 2002

Version 3 – Final

DOCUMENT HISTORY

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1.0	Initial Draft	Vern Danes Brendan Feary	August 23, 2002
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EXECUTIVE SUMMARY

The government of British Columbia, as outlined in the New Era for Business, Investment and Opportunity document, states its commitment to create a cost-competitive business climate and to boost private sector, investment in the resource sector including the booming Oil and Gas sector. In support of this commitment the Ministry of Sustainable Resource Management has initiated a Business Strategy and Transition Plan aimed at constructing a government-wide registry of land and resource encumbrances. This registry will significantly reduce the costs and shorten the time required in gaining access to land and resources for both government and businesses.

Unlike some other jurisdictions, British Columbia has difficulty in providing timely information critical to potential investors. With the completion of this project scheduled for early 2007, British Columbia will become the first jurisdiction to fully integrate both the private land and public land registries in a single land and resource register, providing investors with an instant picture of available investment opportunities.

The Need

As the owner and manager of most of the land and resources in British Columbia, the government of British Columbia has been granting rights to develop and use resources to individuals and companies for over 100 years. This resulting investment continues to fuel the province's economic engine by providing jobs, economic rent through taxation, community development, and thousands of secondary and spin-off benefits. It follows that the efficiency with which the rights are managed has a direct bearing on benefits to the province.

Initially, the province administered land and resources according to a simple and straightforward method. A proponent would request a grant and the province would refer to the ministry responsible for those types of grants who would review the merits of the request, check the availability and, if both were acceptable, grant the request by issuing a document to the proponent. This system of administration worked well as long as land and resources were plentiful and potential conflicting uses were few and far between.

Over time as more and more grants took place, and the types of grants grew, the administration of this mosaic of land and resource tenures has become not only more complex and expensive to operate but has led to delays in responding to proponent requests. In the worst cases, these delays are measured in years, seriously impeding the use of the land and resources.

This complexity is due to one simple fact: the province does not register land and resource grants in a formal register, nor does it require that owners of these rights register changes with the province.

The Solution

The Province, through its ministries who each administer or regulate a mix of land and resource tenures, keeps records of the hundreds of unique transactions that allocate and administer tenures. These transactions, starting from the initial grant of rights, provide the *chain* of events that defines the current state of each tenure. These thousands of chains of transactions are what currently define the fabric of ownership and availability of land and resources in the province. Not only do these transaction chains differ by tenure type but they also differ with time as the methods of administration evolve.

Determination of the status of a particular parcel of land (a process known as *statusing*) requires that all of the pertinent transactions chains are interpreted by each of the ministries authorized to grant land and resources. While this in itself presents a formidable challenge in areas with a long history, unique or ambiguously described transactions, statusing becomes impossible where the chain of transactions has been broken. In those areas, the province cannot determine ownership of land or resources and must pass legislation extinguishing unknown allocations and reestablishing itself as the owner.

In extensive analysis the province has concluded that in order to facilitate the allocation and administration of land and resources it must develop the ability to status quickly. Not surprisingly, technology is seen to be a part of this solution. After all, technology can speed through transactional records and, with proper instructional logic, can determine status. Technology can also display the results over the Web to government and proponents alike.

At first glance this seems like a suitable solution, to have technology interpret transactions; however as one begins to look at the mechanics of this task, to be successful, this system would need to contain all of the logic for all of the land and resource transactions from the beginning of history to the present day and it would require continual updating with new transactions. Once the logic to interpret transactions was written and tested, then all the land and resource transactions would need to be assembled. Some of these transactions are stored in some 25+ ministry systems across government and others are contained in paper-based files.

Clearly using technology to automate the statusing processes currently done by trained staff would be complex and expensive, both to build and to operate.

In an effort to find a better solution, the ministry looked to other registry systems and to other jurisdictions and found that if it *registered the result of the transaction* in a register (register is defined as an official record) that the statusing of a parcel of land would be as simple as looking up the parcel in the register. Furthermore, while it would be necessary to read the transaction chains to determine the current *interest,* it would not be necessary to store or maintain the complex logic of these transactions.

This conclusion was given further credence by the fact that British Columbia currently administers private land in that very way. The land titles administration is based on the Torrens system, which is recognized worldwide for its ability to provide certainty of ownership and title and low administrative costs.

Costs

The notion that statusing must be automated is not new, nor is it unique to British Columbia, this is borne out by the fact that land titles administrators worldwide are converting their transaction based systems, also known as deeds based systems, to Torrens or interest based systems. Whether it is for land titles administration or crown land and resource administration, the task of analyzing all past transactions to determine the starting state is daunting, especially when faced with areas of missing or ambiguous information. Like the problem, the need does not go away, nor does it get easier with the passing of time, on the contrary as new transactions are added the problem continues to grow.

The task of interpreting transactions and providing an accurate spatial representation for each land and resource encumbrance in the province will require the use of trained government staff and legislative remedies to reestablish ownership for those areas where ownership has been lost. The cost of this effort must be determined by careful analysis of the transactional information. Preliminary estimates put this cost at approximately $7-10 million.

To store and make this information available will require the development of an electronic information system estimated to cost between $2 – 3 million.

Benefits

The benefit of better land and resource administration has wide ranging impacts such as:

- Economic Development
    - Immediate benefit for the oil & gas sector since initial deployment is proposed for northeastern British Columbia;
    - Faster land / resource approvals for all sectors (tourism, agriculture, forestry, mining and energy);
    - More equitable and cost effective assessment of land; and
    - More security of tenure because of quality and certainty of information.

- Government Efficiency
  - Reduced cost / risk in confirming legal status;
  - Reduced cost in collecting / maintaining registry information;
  - Sustainable Development;
  - Better land use planning and decision making;
  - Better policy making (First Nations and issue management); and
  - Better use of land and resources.
- Customer Service
  - More timely and increased access to information, and
  - Leadership in electronic service delivery and land records administration.

Summary

British Columbia has reached the realization that being able to account for land and resource encumbrances is critical to its continued economic growth. In an information age, that means being able to do so quickly and efficiently and being able to deliver that information using the Web. In order to accomplish this, a different way of accounting must be introduced. Interest-based land administration is not new to British Columbia; the province has been used to administering the private land titles for many years and it must now be extended to public land and resource administration.

This investment by the government of British Columbia will begin paying dividends immediately and will continue to pay those dividends into the future with increased business brought about through more rapid and secure allocation of land and resources.

INTRODUCTION

To support the government of British Columbia's vision to consolidate the diverse set of Crown land and resource encumbrance registries, the Ministry of Sustainable Resource Management has initiated a business strategy and transition plan, both of which are contained within the following document.

This is a large document and to ease location of the specific topics covered, it has been separated into three parts:

- **Part A** contains the **Business Strategy** assembled using information gathered from internal and external stakeholders on current business practices and future requirements. It documents the best practices observed elsewhere, the conceptual solution and the reasons for adopting this solution in preference to other alternatives.
- **Part B** contains the **Transition Plan**, which identifies projections and priorities to transform the business architecture to the end state described in the business strategy.
- **Part C** contains associated **Appendices.**

A brief summary of each of the sub-sections within these parts follows:

Part A – Business Strategy

(Section 1) Purpose - provides the background and focus of the project, and a description of the consultative process followed.

(Section 2) Current Environment - contains a description of the current situation including:

- The current business processes, functions and systems environment;
- The needs and concerns of internal and external stakeholders based on a series of interviews conducted by the ministry to gather this information**;** and
- The legislative implications and requirements to move the point of conveyance from signature of the conveyance document to the point of registration within the register.

(Section 3) Strategy Overview – discusses:

- The potential for conflict between Ministries and agencies to grant rights to the same land due to the current land and resource registry being a combination of manual and electronic processes, with no central register;
- The (often lengthy) delays arising from the challenge of determining what rights have been granted to whom and where those rights exist, further complicated by rights granted historically; and

- Simplification of the business process as the basis of keeping pace with demands for efficient, timely and accurate rights administration to meet users needs and support the economic growth of the province.

(Section 4) – Review of Other Jurisdictions – provides a summary of significant practices, initiatives and activities being undertaken by progressive jurisdictions in land and resource registry development and implementation. Included is detailed information on the current systems and practices within Australia and New Zealand, Alberta and Saskatchewan, Quebec, and the USA. The information provided is summarized in a table in section 4.7.

(Section 5) – Conceptual Solution – provides the detailed scope of the project including:

- Overview of Land Administration and of the Key Success Factors for Land Registration Systems;
- The vision and objectives of an integrated land and resource register for BC, and the key principles on which the design will be based;
- The core business functions and a list of clients to be served by the registry;
- The core data components, target system architecture, relationships with other systems and the data management objectives; and
- Options for how the change could be financed.

(Section 6) – Recommendation Summary – summarizes the reasons for recommending the development of an alternative to the transaction-based system of conveying rights, and for the solution selected.

Part B - Transition Plan

The transition plan elaborates and adds details to the Integrated Registry Project – Business Strategy. As well it defines an approach, key work areas, business relationships and outline budget and schedules. The following sections are included within this plan.

(Section 8) – Approach – provides an overview of the approach to implementation of the Integrated Land and Resource Register. The implementation process, requirements and architecture step, construction and the operations and support of the system are all explored.

(Section 9) – Technical Solution Delivery – provides a detailed description of the major work streams required to design, develop, deliver and provide operational support for the Integrated Land Resource Registry.

(Section 10) Data Quality Management – provides a detailed description of the Data Quality Management process, identified as one of the most significant issues to be addressed by the Integrated Registry Project.

(Section 11) Business Change Management – describes:

- Adjustments to business processes (e.g. for accepting applications, confirming legal status, etc) and where responsibility for those processes resides, to:
  - Enable introduction of a register based ILLR;
  - Reduce redundancy and duplication of information; and
  - Reduce or eliminate data errors or other data quality problems.
- Required legislation and policy changes;
- The Business Planning and Business Case process;
- Provincial economic benefits; and
- Business case for government ministry and agency and potential private sector investors.

(Section 12) – Transition for Regulators – describes the impacts on ministries and agencies arising from amended processes and responsibilities, as well as the need to provide or support Program Management, Data Conversion and Cleansing activities, Legislation and Policy changes and Registry Use.

(Section 13) Program Management and Communication – describes the requirement for creation of a Program Management Office ensuring active management to minimize expenditures and maximize the benefits of this large multi-year program.

(Section 14) Timeline and Estimates - As only a Business Strategy has been completed at this stage, estimated implementation costs cannot be confirmed with any degree of certainty. This section outlines high level cost and timeline estimates and assumptions, and recommends a data assessment be undertaken to enable provision of more accurate estimates.

(Section 15) External Dependencies and Risks – the success of this project involves many external factors. This section summarizes the known business and technical dependencies and recommends a risk management strategy to be adopted.

Part C - Appendices

- Appendix A – Glossary of Terms
- Appendix B – Acts Conveying Land and Resource Rights – An Example
- Appendix C – Cadastre 2014 Statements
- Appendix D – Reference – Alberta Public Lands Act
- Appendix E – Reference – Alberta Mines and Minerals Act
- Appendix F – Custodian Rights and Responsibilities
- Appendix G – Data Quality Management Process
- Appendix H – Interview Summaries
- Appendix I – Project Plan
- Appendix J – British Columbia GDP by Sector

In addition to the three core parts listed above, the following topics are also provided:

Signoff

Related Documents

- MSRM Registry Integration Planning Request for Proposal No. 132688 (including attachments) – Issued Date March 1, 2002
- Project Statement – Integrated Registries – Issued Date – June 26, 2002
- Cadastre 2014 – Issued Date July 1998
- Integrated Registry Business Strategy – August 2002

Acknowledgements

PART A – BUSINESS STRATEGY

1. PURPOSE

To support the government of British Columbia's vision to consolidate the diverse set of Crown land and resource encumbrance registries the ministry has decided as a first step to develop a business strategy and transition plan. This work includes first gathering information on current business practices and needs both internally and externally to government, and producing the business strategy that consolidates the capture, maintenance and use of registry information in British Columbia. The primary motivations for government's instruction to develop an integrated registry for Crown land and encumbrance information are enhanced economic development opportunities and public cost savings. "New Era" resource commitments that are business drivers for the ministry's Registries Department in general, and the integrated registry project in particular, include:

- Faster decisions and access to Crown land;
- Economic development and competitive business climate;
- Open and accountable decision making;
- Improved customer service; and
- Leadership in "electronic governance."

To prepare for the future, the focus of this project is to:

- Document and analyze the business architecture of the current Registry components (including: Crown land surface rights, Crown land cadastre, administrative boundaries, timber and range tenures, mineral titles and reserves, water rights, energy rights, park boundaries, commercial fish and wildlife harvesting rights, archeology and heritage sites, strategic land use plan zones and contaminated sites;
- Review and analyze the current strengths and weaknesses of the current system and potential opportunities for inclusion of other registry systems;
- Review and analyze land registry systems in other jurisdictions;
- Review linkages and synergies of other ministry integration work such as the Integrated Data Warehouse Project, the Integrated Cadastral Initiative, and the Land and Water Integration Project being conducted by Land and Water BC Inc.;
- Review linkages and synergies with other government initiatives such as the Ministry of Energy and Mines Map Selection Project and the provincial CIO's Enterprise Portal Project;
- Develop governance options and guiding principles including potential partnerships;
- Develop the 3 year business strategy for integration; and
- Develop a Transition Plan identifying projections and priorities to transform the business architecture to the end state described by the Business Strategy.

1.1 Related Documents

The following documents are related to this project:

Document	Issue date
Cadastre 2014	July 1998
MSRM Registry Integration Planning Request for Proposal No. 132688 (including attachments)	March 1, 2002
Project Statement – Integrated Registries	June 26, 2002

1.2 Consultation Process

This strategy was intended to be client-centric and as such is based on extensive consultation with both internal and external stakeholders. Those stakeholders helped to define the business need and to confirm the proposed business solution. In total, over 44 stakeholder consultation sessions were conducted over a three-month period.

Internal consultation was done at two levels, the senior management or Assistant Deputy Minister level through the project Steering Committee, and the management level through the Business Expert Working Group. In addition, two focus group sessions were held with executives of the Ministry of Sustainable Resource Management at key decision points to confirm business direction.

External consultations were done by contacting external agencies and industry associations, and by conducting telephone or in-person interviews to obtain information that was then validated by follow-up calls and interviews. In most cases, a further follow-up was conducted to discuss the proposed solution.

In most cases, interviews were conducted at multiple levels (executive, management and staff) in key stakeholder organizations such as the Ministry of Forests, Land and Water BC, and the Ministry of Energy and Mines. This broad coverage and high level of participation helped to ensure that the resulting business strategy considered different types of use that the Integrated Registry should address. As a result of this analysis, it became obvious that the primary business need for the Registry is to perform “statusing”. Management staff and planning staff perform “statusing” over large areas covering a diversity of uses, whereas operational staff members perform “statusing” as a precursor to issuing a new land or resource right.

The need for rapid and efficient information on current status is the primary business requirement of the registry. Other needs included:

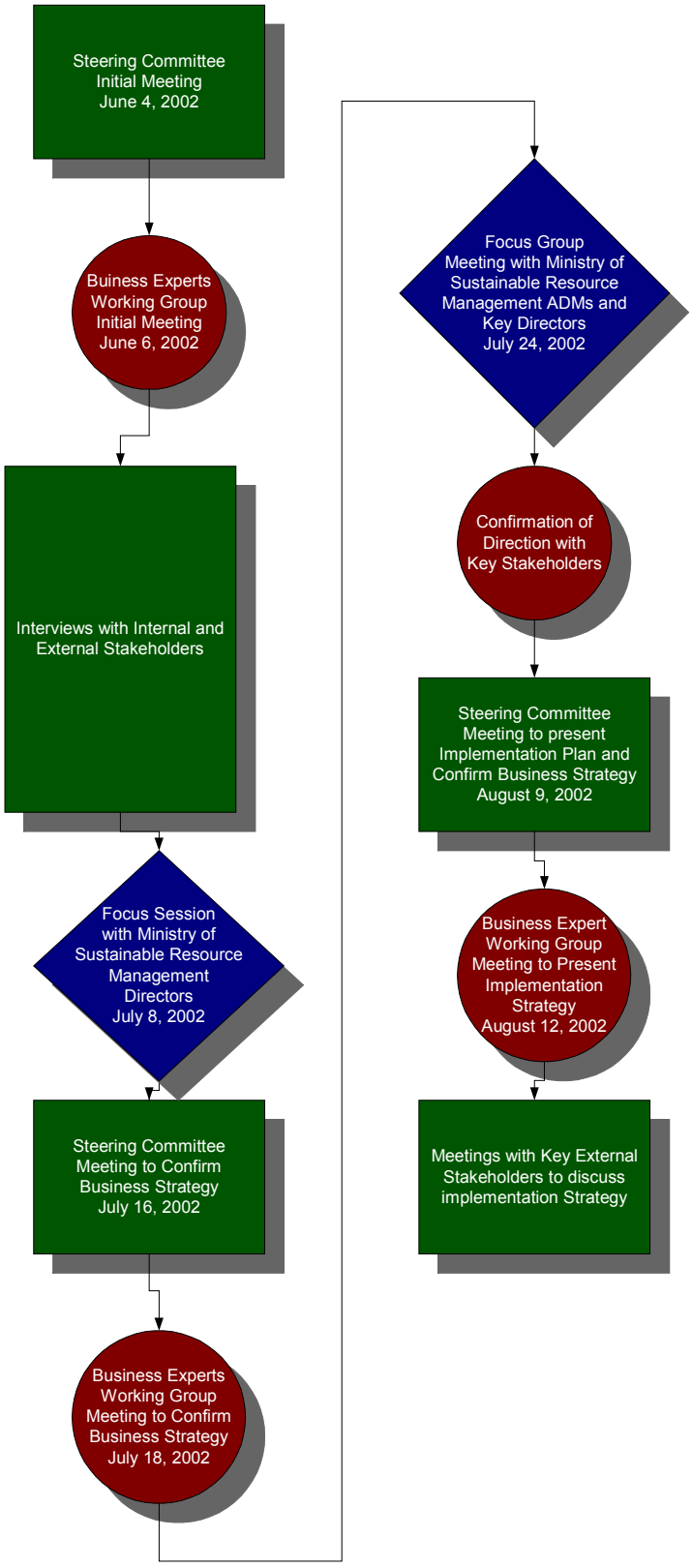
- Historical information regarding previous applications on a particular parcel of land; and
- Status of applications that are being processed on a parcel of land.

Stakeholders, both internal and external, expressed a desire for the registry to provide the facility for potential applicants to perform "statusing" electronically.

In addition to identifying their requirements, stakeholders provided information on current issues that must be addressed before deployment of the Integrated Registry:

- Data quality is inconsistent and flawed in many areas;
- Many records are paper-based (non-electronic) and may require conversion to an electronically accessible format;
- Many related projects are happening simultaneously leading to competing demands for staff resources and adding to confusion;
- Information currently being digitized is not up to date. This backlog of updates must be addressed in the conversion process to a new Registry;
- Organizational uncertainty in roles of regulators;
- Manual research requirements;
- Lack of data distribution policy; and
- Fragmentation of data among regulators, among IT and manual systems, and geographically.

Figure 1 - Consultation Process Overview



2. CURRENT ENVIRONMENT

2.1 Current Business Needs

Registry information plays a critical role in economic development involving the use of land, whether that is private land or Crown land. Without the ability to quickly and efficiently provide for commercial development, opportunities are lost.

Recognizing the strong linkage between economic growth and the administration of land and resource rights, the government of British Columbia has made it a goal to improve access to those rights. This access, it is felt, should extend directly to the potential investors, whether they be large corporations, small businesses or individuals. Table 1 illustrates this unified view of the importance of an accessible and efficient registry.

Table 1 - Summary of Business Needs

Summary of Business Needs	
Government	• Lower costs and better service to users of registries (New Era commitment). • Leader in e-Government • Foster economic development
Government Ministries	• Ability to react faster with more certainty and lower costs. • Achieve efficiencies to assist in meeting core review and budget targets.
Ministry staff	• Ability to check legal or official status of land parcels and register new rights quickly.
Proponents and Citizens	• Ability to access official registry information in a comprehensive form (they can understand the information) easily by using the internet, telephone and in-person and then to have the ability to register new rights quickly. • Reduce costs and increase competitiveness

Both the administrators of registry information in government and the users of registry information in the private sector agree that the single most important element is providing a single point of access for official registry information.

2.2 Current Registries

There is currently no registry of interests other than the Land Titles System for private lands, and that system currently does not have an integrated spatial fabric. Throughout government there are a number of information systems that record land and resource transactions. Those transactions include all aspects of granting and administering those rights. The following table lists the organizations and the records they are responsible for.

Table 2 - Current Registries and Responsible Organizations

Responsible Organization	Responsible for managing records on:
Land and Water BC	• Water licences; expropriations; water users communities; water power projects, water use planning; and water rights • Land tenuring for rural economic diversification; residential use; commercial projects; community needs; industrial development; agriculture and recreation.
MSRM – Registries Department (formerly Crown Land Registry Services Branch of MELP)	• Crown land surface rights (e.g., Crown grants; *Land Act* leases, licenses, permits, easements, rights-of-way) • Reserves, designations & map notations established under *Land Act* • Cadastre (legal property boundaries) • Administrative Boundaries that are established under various statutes (e.g., school districts, electoral areas, municipalities, etc.)
MSRM – Registries Department (formerly Resource Tenures & Engineering Branch of MOF)	• Timber and other tenures issued under *Forest Act* (e.g., forest licenses, tree farm licenses, special use permits) • Timber marks • Forest roads and road permits • Recreation sites, trails and projects • Range (grazing) tenures issued under *Range Act* (e.g., range licenses, permits, hay cutting permits) • Forest related administrative boundaries (e.g., TSA's, provincial forests)

Responsible Organization	Responsible for managing records on:
MSRM – Registries Department (formerly Mineral Titles Branch and Petroleum Titles Branch of MEM)	• Mineral claims, mining leases, placer tenures and no-staking reserves issued under *Mineral Tenure Act* • Coal tenures issued under *Coal Act* • Petroleum tenures and reserves issued under *Petroleum and Natural Gas Act* • Geothermal tenures issued under *Geothermal Resources Act* • Custodian of subsurface or Mineral Act Crown Grants
MSRM – Registries Department (formerly Archaeology Branch of MSBTC)	• Archaeology sites and heritage sites protected under *Heritage Conservation Act*
MSRM – Registries & Resource Information Division (formerly Land Titles Branch of MAG)	• Certificates of indefeasible title and registration of charges / liens against title, established under *Land Title Act*
MWLAP – Fish and Wildlife Allocation Branch	• Guide outfitter certificates / licenses, angling guiding licenses, trapline licenses issued under *Wildlife Act*
MWLAP – Parks and Protected Areas Branch	• Protected Areas (parks, ecological reserves) established under *Park Act* or *Protected Areas of BC Act*
MWLAP – Environmental Management Branch	• Contaminated sites designated under *Waste Management Act*
Ministry of Transportation	• Provincial highways established under *Highway Act*
Land Reserve Commission	• Agricultural land reserves established under *Agricultural Land Reserve Act* and Forest land reserves established under *Forest Land Reserve Act*

2.3 Current Business Practices

This section describes how business is currently conducted.

2.3.1 Client Services and Products from a Registry

The government of British Columbia has charged selected ministries, Crown corporations and agencies with the responsibility to take applications, adjudicate applications, register and manage rights that have been granted. The services provided center around the transferring rights from Crown to private or between two private entities.

In order for a transfer to occur it is necessary in all cases to describe precisely three things:

- Ownership – who currently owns the land or resource in question.
- Current rights – what rights are currently held.
- Impediments – are there administrative or legal barriers to the intended granting or transfer of rights.

While government ministries, Crown corporations and agencies qualify applicants in different ways, they all require this information before they can proceed with granting rights.

Their registry of rights, whether it is stored as spatial information (maps, plans and sketches), transactional information, or as descriptive information, is the primary tool used to determine availability of rights and potential conflicts in the granting or transfer of rights.

2.3.2 Supporting Information Systems[1]

Supporting information systems are both manual and electronic.

- Manual
  - Crown land records
  - Land Grant documents
- Electronic

(see Table 3 - Current Information Systems Supporting Registries)

[1] The source of this information is the Ministry of Sustainable Resource Management Application Inventory. This information is not quality assured.

Table 3 - Current Information Systems Supporting Registries

System Name	Description of Function
ATLAS	• Application to construct and deliver scanned images to TANTALIS and TANTALIS-X (Contents of the survey plan vault).
Automated Land Title Office System (ALTOS)	• ALTOS is a comprehensive computer system with an integrated image subsystem which automates the process of land title registration in British Columbia. External access (e.g. title search) is provided through BC OnLine.
Commercial Recreational Tenure Information System	• A database that records information regarding commercial recreational tenure use.
EnerGIS	• Registry of Petroleum and Natural Gas tenure, Geothermal tenure, and soon to include Coal Bed Methane tenure. Contains official locations of Oil and Gas Wells (OGC). Contains spatial and attribute data for Oil and Gas fields, and other related GIS coverages used for referral processes.
Forest Tenure Application	• Records land clearance status and operational status of Recreation Campgrounds, Trails and reserves including facilities, structural improvements and activities associated with them.
HRIA	• A system for the recording, maintenance and dissemination of archaeological and other types of heritage information as required under the HCA . RAAD is the public window into HRIA
Integrated Corporate Spatial and Data Attribute Database	• Major Forestry initiative to create a current, complete and managed database of information about the land base. INCOSADA will provide a standardized set of corporate spatial & attribute data (i.e. map & text data) with common database structures. INCOSADA will deliver a single suite of tools to Land Information Management staff to support file update & management. ISDD is a set of ORACLE tables defining data standard. There is also a WEB app that queries ISDD. VEGCAP is a vegetation system that will replace FIP/FC1. RTECAP is a tenure processing application that will replace FAMAP.
MEM INTERNET SITE	• Internet access to MiDA Records data. NOTE: MiDA

System Name	Description of Function
	Graphics is the spatial, MiDA records is the attribute side.
MiDA GRAPHICS	• A set of MicroStation vector files and a set of IRAS/B raster files and contains spatial data on all mineral, placer, and coal tenure information, reserves, and alienations.
MiDA RECORDS	• An RDB database containing the record data on all Free Miner Licences, and mineral, placer, and coal tenure information, administrative reserves, and tenure holder data.
PERMLOG	• Tracks Archaeological Permits.
Protected Area Registry (VAX)	• Vax Application that has been maintained because of the relationship with other VAX Applications. • (PSPS,Attendance,Management Levels)
Protected Area Registry (WEB)	• Web Application to capture BC Parks individual protected area information (size, class etc.).
RECCAP	• Online application to enable District staff to enter, edit and update spatial and attribute data for Recreation Resources Inventories using standard web browser.
Recreation Maps	• Online application to display recreation maps. Allows the public, private companies, major forest licences and ministry staff to view different inventories using standard web browser.
TANTALIS	• Maintaining and enhancing the system which records all spatial and attribute information regarding survey and Land Act dispositions. Tantalis is the key system used by BC Assets and Land Corporation and the Oil & Gas Commission to record disposition of Crown lands. Represents the basis for managing over 30,000 tenures with several thousand applications processed each year, along with over 500,000 survey parcels and associated reversions and acquisitions.
TANTALIS-X	• Tantalis Extranet is the web-based viewer which provides crown land information to external government & private sector users. The latter group will form an e-commerce opportunity. This results in better expedited decision-making and streamlined processes for all parties undertaking activities on Crown land.
Water Licence Sidecar	• Created originally by Greg Gale in Omineca/Peace Region, modified by Al Fedoruk. Records additional information with WLIS.
Water Rights Information System	• An application that manages 42,000 active water licenses and $300M of annual revenue from 50,000 clients. The database also contains dam information.
WEBMAP	• Online application to display recreation maps. Allows the public, private companies, major forest licensees and ministry

System Name	Description of Function
	staff to view different inventories using standard web browser.

2.4 Results of Consultation

The following section identifies who was contacted and summarizes the results. The actual interview summaries are appended to this document.

2.4.1 Organizations Contacted

The following organizations were contacted and most provided input to this strategy.

Ministry of Sustainable Resource Management

- Sub-Surface Tenures
- Land Tenures
- Forest Tenures
- Archaeology
- Surveyor General
- Business and Information Services Division
- Integrated Cadastral Initiative
- Land Titles
- Resource Management Department

British Columbia Assessment Authority

- Corporate Services

BC Oil and Gas Commission

- Corporate Services

Ministry of Energy and Mines

- Resource Development Division

Land and Water British Columbia Inc.

- Land and Water Management Division
- Marketing and Development Division

Ministry of Forests

- Resource Tenures and Engineering Branch
- Forest Enterprises Branch

Ministry of Water, Land and Air Distribution

- Environmental Protection Division
- Fish, Wildlife and Protected Areas Group

Stakeholder Groups

- BC Yukon Chamber of Mines
- BC Mining Association
- Land Reserve Commission
- Corporation of Land Surveyors of B.C.
- Canadian Association of Petroleum Producers(
- Council of Forest Industries (COFI)

[*] Organization was contacted but did not respond.

2.4.2 Summary of Primary Needs and Concerns

This table summarizes how these stakeholders use registry information and their views and concerns with the establishment of an integrated registry of land and resource rights.

	Currently Searches Status	Need Web Access	Support an Integrated Registry	Level of Support[2]	Concern for Data Quality	Require accurate Cadastral base	Cost is an Issue	Need Application Information	Currently Meeting Expectations[3]
External Stakeholders									
Corporation of Land Surveyors of BC	na	x	x	4	x	x	x	nc	na
Council of Forest Industries	na	x	x	2	x	x	x	nc	na
Mining Association of BC	na	nc	x	2	nc	nc	x	nc	na
BC Yukon Chamber of Mines	na	x	x	5	nc	x	x	nc	na
Ministry of Sustainable Resource Management									
Archeological Planning and Assessment	na	x	x	2	nc	nc	nc	nc	yes
Land Tenures - Attribute Maintenance	x	x	x	2	x	x	nc	x	no
Land Tenures - Spatial Maintenance	na	x	na	1	x	x	nc	x	no
Subsurface Tenures	x	x	x	5	x	x	nc	no	no
Forest Tenures	x	x	x	5	x	x	nc	x	no
Surveyor General	na	na	x	4	nc	x	nc	nc	nc
Land Titles Branch	na	na	x	1	nc	nc	na	nc	yes
Decision Support Services Branch	x		x	5	x	x	nc	x	no
Government Stakeholders									
Ministry of Forests (Victoria)	x	nc	x	5	x	x	no	x	no
Ministry of Forests (Regional)	x	x	x	3	x	x	no	no	no
Land and Water BC (Water)	x	x	x	5	x	x	no	x	no
Land and Water BC (Land)	x	x	x	5	x	x	no	no	no
Ministry of Energy and Mines (Petroleum Lands Branch)	x	x	x	2	nc	nc	x	nc	no
Ministry of Energy and Mines (Titles Branch)	x	x	x	5	x	x	nc	nc	nc
Integrated Cadastral Initiative	x	na	x	5	x	x	x	x	no
Land Reserve Commission	x	x	x	5	nc	x	nc	nc	no
BC Assessment Authority	no	na	x	2	nc	x	no	nc	na
Ministry of Water, Land and Air Protection	no	na	x	2	nc	nc	no	nc	na
Canadian Association of Petroleum Producers	na	nc	x	2	nc	nc	x	nc	nc

[1] – Some interviewees expressed a concern that the Ministry of Sustainable Resource Management may not be the appropriate Ministry to integrate registry information or alternately that the registry information should not be integrated in the Ministry of Sustainable Resource Management.

[2] – Level of Support was rated on a scale of 1-5 indicating the amount of value or impact an integrated registry would have to the interviewee. 1-Not much value, 2 – May be of some value, 3 – Will use it if it is available, 4 – Require the information that it would contain, and 5 – An integrated registry is critical to business.

[3] – Some interviewees are currently not meeting workload expectations and see the integrated registry as having potential to help meet those expectations.

The table above summarizes comments by various interviewees according to views and concerns expressed:

- Currently Searches Status – These organizations stated that they currently perform "statusing" as part of their business request or obtain status information.
- Need Web Access – These organizations stated that if a registry were available that they would access it through a Web interface.
- Support an Integrated Registry – These organizations, through their interviews, indicated that they would support an integrated registry. The design of the proposed registry was not available at the time of interview and some chose not to comment until after this report is released.
- Level of Support – Stakeholders, in most cases, indicated the level of utility that an integrated registry of land and resources would have on their organization.
- Concern for Data Quality – Most organizations that are familiar with or use registry data on a regular basis expressed a concern with the current state of data and cautioned against deployment of a new registry without significant effort to ensure complete and accurate data.
- Require an Accurate Cadastral Base – These organizations recognized the need for providing a Cadastral base for the Registry to known accuracy levels.
- Cost is an Issue – Some organizations, anticipating that a new Registry would operate on a fee for service basis, expressed a concern about those fees. They either preferred that fees not be charged or that they be minimal.
- Need Application Information – Many interviewees expressed a business need to know if an application for an encumbrance is pending.
- Currently Meeting Expectations – Some organizations are currently experiencing volume delays in providing "statusing" and related services.

2.5 Policy and Governance

The adoption of an "interest-based" register will require changes to legislation that will shift the point of conveyance of a right, from the point at which a conveyance document is signed to the point at which that right is registered. This change means that the implement conveying the right is the register. In terms of business practices, the difference may not be noticeable to either the regulating agency approving that encumbrance or the recipient of the right, especially if the registration and confirmation of registration is communicated electronically.

In spite of this apparent transparency there is legal significance and, therefore, a requirement for legislative changes to describe the act of registration. This section examines this in more detail.

2.5.1 Current Governance and Policy

In British Columbia as with all provinces in Canada the right to allocate land and resources flow from the British North America Act (BNA Act). The province, through statutes, delegates the responsibilities to various ministers. This delegation may specify what rights a minister may convey on behalf of the Crown and what conditions that minister must meet in order to convey those rights.

For an example of the rights administered by the Ministry of Energy and Mines and the Ministry of Forests, see Appendix B.

For a listing of statues conveying rights administered by Ministry of Energy and Mines and the Ministry of Forests, see Appendix B.

Most acts also further delegate responsibilities for the administration of rights through Regulations approved by Cabinet through Orders in Council (OIC).

For example the Forests Act has 24 regulations that primarily determine how the rights are allocated, maintained, and removed or terminated. A complete listing of the Regulations under the Forests Act in provided in Appendix B.

In addition to Acts and Regulations most Ministries also establish policies to assist in the management and administration. Both Regulations and Policies provide details or clarification of the authority delegated to a Minister under the appropriate statutes or Acts.

Legislative Implications

The Acts and Regulations described above currently describe transaction processes that must be used to convey rights. These transactions begin with an application process and culminate with the issuance of a certificate or other legal document that conveys that right.

An interest-based register-based system has identical application processes, as does a transaction-based conveyance system; however confirmation of registration must occur BEFORE a certificate or legal document is issued. More significantly, the certificate or document issued to a holder of a right conveyed under an interest-based register merely provides proof of registration and does not itself convey the right.

Because of this fact, it is possible with an interest-based register to guarantee ownership of a land or resource encumbrance. This certainty of title is one of the basic founding principles of interest-based registries.

2.5.2 Required Legislative and Policy Changes

Required Changes

To change from transaction-based conveyance to register or interest-based conveyance requires the addition of the registration step in all conveyance processes. This can be accomplished formally in at least two ways:

- Amending and revising each Statute or Act, Regulations, and Policies that describe the process of conveyance to include the addition of registration.
- Creation of a new Crown Land and Resources Registration Act that would describe the role of registration in the conveyance of crown land and resources.

The goal of these legislative changes is to formally recognize the role of registration in any conveyance of Crown land and resource rights.

Another less effective mechanism is to alter conveyance policy compelling conveyance authorities to include the additional step of registration before issuing the conveyance document. This system is less effective since it is dependent on administrative processes instead of legal processes for its accuracy and certainty. Creation of a "register" administratively would result in a database of interests, as opposed to a register of interests.

The province of Alberta currently uses a database of primary interests as its mechanism of recording conveyance activities. In that province, surface rights are recorded in the surface records database, which records all land and resource encumbrances except private lands and subsurface rights. Having had this system in place for over 50 years, policies have been refined to the point where there is a high comfort level in government of its accuracy and completeness.

Legislation

To create a register of land and resource encumbrances that would provide certainty and accuracy would require changes to legislation as discussed in the previous section. While it is not within the scope of this report to provide a legal review of legislation, Table 4 below identifies some of the legislation that may potentially be affected. Of course, if the province elects to pass a new statute as described in the previous section, it would not be necessary to amend each individual statute.

Table 4 - Affected Legislation

Statutes with High Probability of Amendment	Potentially Requiring Amendment
• Coal Act • Environmental Management Act • Fisheries Act • Forest Act • Highway Act • Land Act • Mineral Tenure Act • Mines Act • Park Act • Petroleum and Natural Gas Act • Petroleum and Natural Gas (Vancouver Island Railway Lands) Act • Pipeline Act • Range Act • Water Protection Act • Wildlife Act	• Assessment Act • BC Online Act • Railway Act • British Columbia Transit Act • Capital Commission Act • Capital Region Water Supply and Sooke Hills Protection Act • Columbia Basin Trust Act • County Boundary Act • Creston Valley Wildlife Act • Ecological Reserve Act • Expropriation Act • Farm Practices Protection (Right to Farm) Act • Financial Administration Act • Forest Land Reserve Act • Forest Practices Code of British Columbia • Gas Utility Act • Geothermal Resources Act • Greenbelt Act • Heritage Conservation Act • Highway (Industrial) Act • Highway Scenic Improvement Act • Hydro and Power Authority Act • Hydro and Power Authority Privatization Act • Indian Cut-off Lands Dispute Act • Island Trust Act • Land Reserve Commission Act • Local Government Act • Land Survey Act • Land Title Act • Mineral Land Tax Act • Mining Right of Way Act • Oil and Gas Commission Act • Property Law Act • Protected Areas of British Columbia Act • Soil Conservation Act • Waste Management Act

Legislation describing a transaction process in the conveyance of rights *must* be amended to include the integrated register. Other legislation describing where information regarding land rights exists *should* be amended to indicate when the register should be consulted.

3. STRATEGY OVERVIEW

3.1 Introduction

Over 90% of the land in the province of British Columbia falls under Crown ownership. The granting and use of Crown land resources forms the basis for the economic, environmental and social well being of the province. It follows that the speed and efficiency at which those rights can be administered and granted becomes a major factor in the economic growth of the province. Of course, along with speed and efficiency it is essential to deliver more accurate information, especially as adjacent and potentially incompatible encumbrances become more common.

Having evolved from simpler times, the current method of tracking encumbrances is not able to keep pace with current demands. It has been a long held belief that the solution to better tracking lies in new information technology; however, our analysis shows that technology alone cannot deliver the necessary business benefits. This section discusses business simplification as the first step to keeping pace with demands.

3.2 Current Crown Land and Resource Registry Situation

Legislation and policy in British Columbia permits ministries to issue tenures and rights to Crown lands and resources to individuals and companies for a variety of different reasons and in a variety of different methods. This legislation and policy has not been developed in an integrated manner and understandably qualifies, grants, and records these encumbrances in a variety of different ways.

The fact that a variety of government Ministries and agencies have the authority to grant rights would not be an issue if the issuance of a right was mutually exclusive of the other potential rights that could exist on the land; for instance, granting sub-surface rights to one person and granting surface rights to another is not an issue unless the owner of the sub-surface rights wants access by using the surface.

In most cases, there is no overlap between Ministries and agencies regarding the type of rights that they may grant. The Ministry of Forests is the only agency that can grant timber rights, Land and Water BC is the only agency that can issue water rights, etc. Where conflicts occur however, is when both are granted access rights at the same time, where the consumption of one resource requires the removal of another resource, or where the government wishes to sell the land or grant it as part of a First Nations settlement or use the resources for its own purposes. When any of these situations occur, government's greatest challenge is determining what rights have been granted to whom and where those rights exist. This is further complicated by the rich mosaic of rights that have been granted historically.

3.3 Current Business of Managing Rights

The current method of encumbering Crown land and resources works acceptably under certain circumstances, namely that there is a small number of rights that can be granted, there is a small number of government ministries or agencies that are empowered to grant rights, or the degree of separation of these rights is high (they are geographically separated - exercising one right does not affect another right).

As the demand for the use of Crown land and resources intensifies, the potential for conflicts also intensifies and determining these potential conflicts prior to issuing new rights becomes of paramount importance to all government ministries and agencies. Since the ability to issue and extinguish rights is widely delegated across government and there is no requirement for those government ministries or departments to keep an official register of rights issued, much less register those rights in a central registry with the exception of Section 7 of the Land Act[2], determining the current interests for a given parcel of land requires laborious research by experienced staff.

This task is made even more complex due to the fact that rights exist as a result of transactions (rights are granted, revised, extinguished, assigned, renewed, etc.) and not based on registration of rights.

To further complicate the administration of rights, government has reduced budgets to resource agencies over past 10 years or more. These reductions have severely compromised the integrity of the data, which has exacerbated the problem further. The Ministry of Sustainable Resource Management was created in part to help address this issue, but resourcing within the Ministry remains a problem.

The Ministry of Sustainable Resource Management, having identified the goal of producing an Integrated Registry in its service plan, undertook the creation of a plan that it published in November of 2001, titled An Integrated Registry for Provincial Land & Resource Encumbrance Information Development Plan. This plan discussed scope, vision, and issues, as well as producing a high-level project plan for a technological integration of transaction systems. The development plan also recognized, however, that more information must be obtained from stakeholders before proceeding further.

In response to this recommendation to engage stakeholders, the Ministry and Fujitsu Consulting began a more extensive consultation process with stakeholders and users, with the goal of understanding their needs and expectations. It became clear through those consultations and examination of other jurisdictions that what is required is a different way to record encumbrances.

[2] The *Land Act,* section 7 obligates the Minister responsible for that act to maintain a registry and also compels every ministry of the government to record in the registry all Crown lands under its administration, and the acquisition in fee simple and disposition of those lands; however, it also states that "No action may be brought by any person against the government for loss or damage caused by reliance on the records of the registry by that person for any reason or purpose including, without limitation, reliance for the purpose of establishing priorities of interest or reliance on the completeness of the records."

3.4 The Technology Solution and why it won't work

Current technology permits sharing of information between ministries and agencies in a manner that has never been possible before. This technology allows very different computer systems to share information seamlessly, and this together with advances in Web technology not only permit, but have built the expectation, that anyone anywhere can obtain customized information often integrated on a single computer screen.

Upon initial assessment it was thought that using this new technology that simplifies access to information and integrates information quickly seemed to be the right solution. This would be true were it not for two factors, the first of which is that determining the state of ownership and rights conveyed for a parcel of Crown land requires converting transactions into registry-like information; and secondly, the complexity of transactions leading to rights increases daily as government changes processes in response to new business needs.

Building the logic for such a technological application would be very complex and ever changing and, while the team considered this option, it became apparent that it would be expensive and would not yield the certainty of information that was desired by the stakeholders. This investigation led to a search for a business solution that would not place such a high reliance on technology and yield the certainty of information needed by stakeholders.

3.5 The Business Solution

It is not necessary to simplify or harmonize the process of granting or managing Crown land or resource rights in order to have the ability to quickly and definitively view all registered rights on a parcel of Crown land. Ministries, agencies and industry are quick to point out the fact that business demands are changing and that those changes should be allowed to occur perhaps even faster.

The key to solving this perplexing problem lies in adopting some new principles about how interests are recorded, conveyed and searched.

- **Register Creates Right**
  The registered interest becomes the source of legal title as opposed to the transaction leading to the right. The register then will be the proof of the right and no right can exist without it.
- **Simple Registration Procedure**
  Registration of new interests should be simple, not requiring the complex land statusing processes now currently required to determine if other rights exist.
- **Open and Accessible**
  The register is accessible to the public.
- **Operate in a "Torrens like" manner**
  Guaranteeing the integrity of Crown land and resource rights is an essential principle

that has proven successful in title registration systems in British Columbia and world-wide. As in the Torrens system, formal registration of interests is a mechanism for retaining priority against competing interests over the same land.

- **Register is Independent of Business Processes**
  Business processes must change to keep up with demands for services; however, a properly designed register should provide support to the current and future business process needs.

Under these principles the province would administer Crown land rights in much the same way that it currently administers private land rights, issuing "title" to those rights and guaranteeing that title.

Also like the Torrens system, a key to the Crown land and resources registry is the ability to describe and identify each parcel by using a unique identifier. This cadastral key along with the name of the owner and the description of the right being conveyed are the essential elements of the registry. While the title to Crown land and resource rights results from transactions, the registry need not record each of these transactions nor is it necessary to map out transactions to determine the rights and ownership on any given parcel of Crown land.

3.6 Summary

British Columbia has a long history of granting and managing land and resource rights on Crown and private lands. It has done so successfully by using different transactional processes across various ministries. Dissatisfaction by stakeholders with the response time and certainty of information has prompted government to reexamine how this business is conducted. To do this, government has formed a new ministry—the Ministry of Sustainable Resource Management—and has tasked that ministry with integrating registry information through its Service Plan goals.

The Ministry has examined two options, the first was to provide technology to link the current transactional processes, and the second was to change the way the entire government records land and resource rights.

Building on its success in administration of private lands with the Torrens land registry system, the Ministry examined other jurisdictions and concluded that not only could a similar system be used for registering public land and resource rights, but that other jurisdictions are already moving in that direction.

While the solution to integrate registries was first thought to be a purely technological one, it became readily apparent that in order to meet the needs and expectations of stakeholders is was necessary to change the business of registering encumbrances. During discussions with other jurisdictions it became apparent that, if British Columbia made that change in the near future, it would become a leader in the management of land and

resource encumbrances, since no other jurisdiction could be found where both public and private land rights were integrated in a single register.

4. REVIEW OF OTHER JURISDICTIONS

4.1 Scope of Investigation

The purpose of this section is to provide a summary scan of significant practices; initiatives and activities being undertaken by progressive jurisdictions in land and resource register development and implementation. It is based solely on the review of available published information and limited telephone interviews.

4.2 Relevance to British Columbia

Investigations of other jurisdictions revealed that, although no other jurisdiction has implemented a fully integrated land and resource registry, at least two of them - Australia and Alberta - have made significant strides towards integration by implementing *interest-based* systems as recommended in this strategy.

Cadastre 2014, a discussion paper representing the opinions of experts from 25 countries, provides an insight into the policy direction of land and resource administrators worldwide. These expert recommendations confirm the anticipated need for integrated (spatial and attribute) information that is interest based.

Australia and New Zealand are world leaders in land and resource administration and have provided a valuable insight into policies that are required in British Columbia. These policies include: data access and management, pricing policies, overall policy on government management of land and spatial information, data custodianship, liability, and metadata and integrated data models. This information is available and could be used substantially to develop similar policies for British Columbia.

Alberta has an interest-based Crown land administration system that provides a basis for comparing British Columbia's current transaction-based system with an operational interest-based system. This is particularly evident in northeastern British Columbia and northwestern Alberta that straddle significant oil and gas reserves. Oil and gas companies developing those reserves cannot comprehend why Alberta can provide nearly instant land status information, whereas British Columbia cannot. Since the resources and the oil and gas companies are nearly identical, this region can be used to compare the two distinctly different land administration systems.

Saskatchewan has created a Crown corporation (Information Services Corporation of Saskatchewan) for the purpose of providing land administration to its citizens. Although relatively new, it provides a model of arms length (from government) land-based administration.

Generally, governments institute cadastres for tax-related (property tax), legal (registration of real rights) or juridical (delimitation of ownership) reasons. Quebec

originally created its cadastre for legal reasons, but over the years, the cadastre has been used for other purposes, such as establishing property taxes, urban planning, managing utility networks, and enforcing territorial legislation, which, because the system consisted of some 3.7 million properties on 350,000 paper-based plans, produced significant delays and uncertainty. On May 6, 1992, however, the Quebec government launched the Cadastre Reform Program designed to provide Quebec with a comprehensive computerized cadastral map showing the province's 3,700,000 or so private properties. To implement such a large-scale project, the juridical, technical, methodological and financial aspects of Quebec's cadastral system had to be rethought. In addition, the government of Quebec introduced a spatial reference information system, and the computerized version became the official version of the cadastre.

British Columbia is currently producing its cadastre through the Integrated Cadastral Information Society (ICIS), and similar to Quebec, will have access through ICIS to an integrated cadastre that will serve multiple purposes.

A variety of different models exist in the United States, and while some show some relevance to British Columbia, there does not appear to be any one jurisdiction that has fully integrated its land and resource registries.

From the investigations carried out under this project, it seems highly probable that, if British Columbia implements the register as defined in this and other documents according to the timelines currently under consideration, British Columbia will become a world leader in land and resource administration.

4.3 International – Cadastre 2014

There is considerable activity in the area of cadastral reform occurring at the international level. Changing humankind to land relationships, changing political landscapes in places such as Eastern Europe and Africa, and drivers such as sustainable development, economic reform, urbanization, globalization and the information revolution are forcing countries and jurisdictions to reform their practices and systems used for land administration.

Many activities are being sponsored by organizations such as the United Nations and the World Bank, and carried by groups such as the International Federation of Land Surveyors (FIG). Of these activities, a work produced by the FIG has a high degree of relevance for BC and the Integrated Registry Project. Published in 1998, the 'Cadastre 2014' paper outlines a possible 20-year vision for the future of cadastral or land records administration systems for the year 2014.

'Cadastre 2014' was 4 years in the making and represents the collective thinking and results of considerable discussion from a panel of recognized experts representing over 25 countries, including Canada. In addition to an assessment of current cadastral systems and identification of the current reforms and trends, Cadastre 2014 outlines a number of

key statements and principles which defines the vision. A list of Cadastre 2014 Statements and their relevance to British Columbia is provided in Appendix C.

4.4 Australia

Australia continues to show considerable leadership in the evolution of land-related information systems and management of geo-spatial information. Arguably this leadership was first demonstrated in the mid-nineteenth century when Robert Torrens first developed the principles for land recording in South Australia that are still in common use by many jurisdictions around the world (including BC). These principles have stood the test of time, have been successfully deployed in both manual and automated forms, and continue to provide a level of simplicity, efficiency and certainty, unmatched by other methods of land recording.

Following this tradition, Australia has been a major influencing force in the development of the 'Cadastre 2014' vision and has facilitated or contributed to other important efforts to bring together business experts from the international community to discuss and resolve issues and to chart the future direction for land administration relative to economic, social, environmental, political and technological drivers. The underlying premise in all these efforts is the recognition that stable land information systems, methods of land recording and land information infrastructures are critical for the sustainable development of communities, jurisdictions and countries.

The federal and state governments in Australia have also demonstrated leadership in building collaborative partnerships leading to the development of numerous important standards in the management of land-related information and the development of a national spatial data infrastructure using parcel or cadastral information as its base.

This section provides a brief overview of some the work performed by the Australians that has relevance to the directions being pursued in BC generally, the ministry and the Integrated Registry Project in particular. The Australia New Zealand Land Information Council (ANZLIC) is included because of its national advocacy and coordination role and the work it has completed in developing a number of important policies, standards and guidelines used by all states to support the management and exchange of land-related information. The states of Victoria and Tasmania are included because of the leadership they have shown in particular areas of relevance to BC. However, all Australian states and New Zealand are doing interesting things. New Zealand warrants a passing mention because of its approach to the submission of digital survey plans, as has been identified in a previous report by Sierra Systems Consultants.

4.4.1 Economic Benefit to British Columbia based on Australian Experiences

It is possible to estimate the potential economic impact on British Columbia based on experiences in Australia.

In 1995, Price Waterhouse conducted a study of economic benefits accruing from investments in Land and Geographic Data Infrastructure that concluded that over 5 years an investment of $1.125 billion would generate $4.5 billion in measurable benefits[3].

The table below comparing the two economies shows that, although Australia is almost 5 times larger than British Columbia, it has generally the same distribution. Like British Columbia, Australia is rich in natural resources and is a major exporter of commodities that account for 57% of the value of total exports, so changes in infrastructure that affect the commodity sectors have a multiplied effect in benefits.

Table 5- Economic Comparison between British Columbia and Australia

	British Columbia	Australia
GDP (1999)	$92.0 billion	$445.8 billion
Industry Distribution (1999)	25.4% - Goods Sector 74.6% - Services Sector	29.0% - Goods Sector 71.0% - Services Sector
Commodity Exports (% of total exports)	40%	57%

Making a comparison to British Columbia is difficult because it is not known how much the expenditures are, or, given the fact that most of this work is not integrated, what the current return on investment is. Certainly integrating and sharing information, as proposed in the Business Strategy, will increase the return on investment, not only on the money expended to create the integrated registry, but also the money expended by utilities, forest companies, mining and energy companies in planning and describing their interests.

While it is speculative to do so without the benefit of a cost-benefit study, one could conclude based on GDP comparisons alone, that the integrated registry implementation could result in over $1 billion in benefits over 5 years for the British Columbia economy.

[3] Australian Land and Geographic Data Infrastructure - Benefits Study - Price Waterhouse Economic Studies & Strategies Unit produced for for the Australia New Zealand Land Information Council, February 1995

4.4.2 Australia New Zealand Land Information Council (ANZLIC)

ANZLIC was originally established in January 1986 as the Australian Land Information Council (ALIC) by agreement between the Australian Prime Minister and the heads of the State governments in response to a clear and growing need to:

- Coordinate the collection and exchange of land-related information between the different levels of government; and to
- Promote the use of that information in decision-making.

In the late 1970s, similar administrative and technical issues in managing their computerized land information databases confronted all jurisdictions in Australia and New Zealand. Cost-efficient access to compatible land information was required in order to enable effective decision-making by governments. There had been minimal coordination on a national scale although there was some informal communication amongst land information managers. Membership in ANZLIC includes all the Australian states and New Zealand.

ANZLIC's vision is that Australia's and New Zealand's economic growth, and social and environmental interests are underpinned by quality, spatially referenced information. It will achieve its vision through:

- National leadership and advocacy in the management of spatially referenced information;
- Partnerships between the community, industry and governments;
- Promulgation and adoption of standards, policies and guidelines; and
- Promoting the development of a national spatial data infrastructure.

To achieve its vision, ANZLIC has established the following goals for the period 2000 to 2005:

- A comprehensive framework of policies and standards;
- Availability of accessible datasets compliant with the spatial data infrastructure;
- Recognition, at all levels of government, industry and the community, of the necessity for quality spatially referenced information; and
- A competitive, innovative and robust spatial information industry.

Of particular interest to BC and the Integrated Registry project is the work that ANZLIC has completed in the development of policies, standards and guidelines. Relevant work includes:

- **Data Access and Management Agreement** – Made up of a Model Protocol & License Agreement, this has been developed to define a set of consistent and workable arrangements that can be used by cross-jurisdiction partnership projects to streamline access to data and derived information products, and to ensure consistency with protocols, standards and guidelines for the development of an Australian Spatial Data Infrastructure.
- **Guiding Principles for a Spatial Data Access and Pricing Policy** – This has been prepared to assist the preparation of a model spatial data access and pricing policy. The policy is aimed at providing easy, efficient and equitable access to fundamental spatial data.
- **Policy Statement on Spatial Data Management** – Establishes a set of principles for the responsible management of spatial data as a critical national resource and commits all jurisdictions in Australia to cooperate in the implementation of the Australian Spatial Data Infrastructure (ASDI) that will give effect to those principles.
- **Data Custodianship Guidelines** – Data Custodianship is a key principle underpinning the ANZLIC vision for spatial data infrastructures. These Guidelines explain the principle of custodianship and set out the rights and responsibilities of custodians and users.
- **Liability** – Discusses the issue of liability that data custodians may be exposed to. The issues include the:
  - Use of data that may contain errors;
  - Application of data that was adequate for the purpose for which it was originally captured, but may not be for a subsequent application;
  - Uncertainties arising from the merging of data from several sources; and the
  - Application of the resulting data to a task quite unrelated to the original purpose of the individual datasets.
- **Metadata Guidelines** – Established to support the implementation of a comprehensive metadata directory system that provides free access to information about spatial data, who holds it, its characteristics, and how a potential user can obtain it.
- **National Cadastral Data Model** – Developed from a review of cadastral data models supplied by jurisdictions in Australia and New Zealand, the National Cadastral Data Model is a key component in the development of the Australian Spatial Data Infrastructure (ASDI). Comprised of well described features, their attributes and entity-relationship diagrams to show the relationship between features, the data model serves a number of purposes, including:

- To describe digital cadastral information;
- To integrate the cadastre with other land systems;
- To be an agreed model for the specification of digital cadastral data bases;
- To be used in conjunction with a standard Cadastral Data Dictionary;
- To be an agreed model for the specification of digital data transfers; and
- To test/specify new technology requirements.

Additional Information

Detailed information about ANZLIC and its initiatives can be obtained from the following Website at www.anzlic.org.au.

4.4.3 State of Victoria

Victoria is the smallest of the mainland Australian states, but is the second most populous with 4.8 million people – 70% of whom live in the Melbourne metropolitan area. It is around one quarter of the size of BC (228,000 sq km) – 30% percent of the total area is Crown land. The total number of land parcels is 2.4 million and 78 local government councils administer the state.

Commencing in the early 90's, following a comprehensive report by Canada's Tomlinson and Associates, Victoria has been moving steadily towards implementation of its vision of enabling all Victorians to access and use the geo-spatial information they require.

Victoria is currently recognized as the leading Australian jurisdiction for land information management. It has comprehensive strategy in place and has made significant progress in partnering with local government to implement portions of that strategy, something the other states have so far been unable to do. Both of these elements provide some useful insights and are relevant to the situation here in BC. An outline of these two key elements follows.

The Geospatial Information Strategy

Victoria's overall strategy, known as the Geospatial Information Strategy, is comprised of eight distinct components covering:

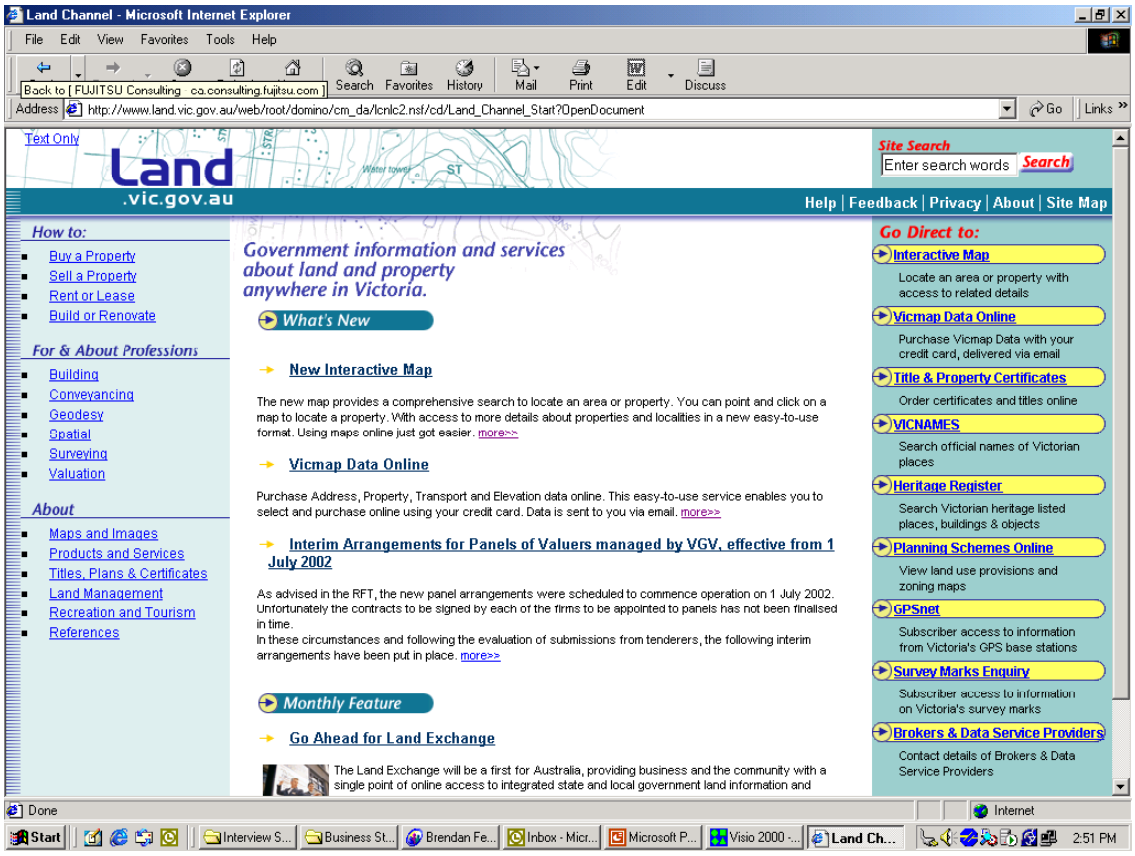
- **Framework Information** – Information considered fundamental to the development and operation of the geospatial information infrastructure upon which other business information is created or maintained. Represents the 'supply side' of the information industry and includes geodetic control, address, cadastre/property, transportation, administrative, elevation, hydrology and imagery.

- **Key Business Information** – Represents the 'demand' component of the Victorian spatial information industry and is considered of value to the development and operation of the information infrastructure. Includes information about natural resources, regulatory and strategic planning, social, water, energy and telecommunications utilities, and property.
- **Custody** – Guidelines to identify custodians for datasets and to establish clear custodial roles, responsibilities and arrangements in the collection, management and sharing of information. These guidelines are based on the standards set by ANZLIC identified earlier.
- **Metadata** – Guidelines for management of data enabling ease of data discovery and navigation, data management and data utilization. These guidelines conform to the standards established by ANZLIC.
- **Pricing -** Establishes pricing principles that encourage increased use of geospatial information by minimizing licensing and delivery costs and providing a revenue base sufficient for custodians to maintain geospatial information to the standard required by users.
- **Access Infrastructure** – To provide a simple, effective means of locating and obtaining geospatial information. The access infrastructure is provided through the 'Land Channel' portal and consists of three parts:
    - A Statewide spatial-data directory acting as a single access point;
    - A multitude of distributed, custodian and data service provider based clearinghouses, providing detailed information as to the datasets they offer and ordering and supply arrangements; and
    - Data stores – data warehouses and servers – to process and deliver the requested data with transparent links to connect them.
- **Spatial Accuracy** – Provides a means of integrating any or all framework and business information, to known levels of spatial accuracy. It addresses:
    - Technical specifications for applicable datums, projections and coordinate systems, and recommendations for preferred options;
    - Procedures for upgrading spatial accuracy of framework and key business information sets;
    - Nomination of preferred map bases for particular uses; and
    - Significant changes in base, such as the adoption of a new geodetic datum.
- **Awareness** – Increased community awareness and understanding is required to ensure that geospatial information is used sensibly, is an effective aid to decision-making and is accessible, easy and simple to use. The awareness program is designed to ensure Victorians get full benefit of geospatial information as it becomes available.

The 'Land Channel' Access Portal

In terms of implementation, Victoria is one of only two states (Tasmania is the other – see below) that provide a comprehensive range of electronic services over the Web. These services are provided via the 'Land Channel' portal as shown below.

Figure 2 - Victoria's 'Land Channel' Portal



The Geospatial Information Strategy

Victoria has also just received approval for the establishment of a Land Exchange that will operate as a new gateway to Victoria's $28 billion-per-year property industry. The first of its type in Australia, the Land Exchange will provide business and the community with a single point of online access to integrated state and local government land information and transactions. The Land Exchange is designed to operate as a comprehensive online market place, where parties can exchange land-related information and perform transactions via the Internet in a safe and regulated environment. It will enable people to:

- Buy and sell land;
- Register planning applications; and
- Determine the status of Crown land.

Local Government Partnership Model

Victoria has successfully implemented a partnership model between 74 of the 78 local councils and the state government. This model has some similarities to the ICI model here in BC. In Victoria, the state government is responsible for providing and updating the basic digital cadastral database for local government, with local government in turn providing land parcel and property data (including address information) to the state government. This has resulted in:

- A marked improvement in the quality of core digital map bases;
- A reduction in duplicate maintenance of map bases;
- Increased adoption of GIS technology by local government; and
- An observable increase in flow-on benefits to the community.

The partnership between the state government and the local councils is based on the following principles:

- Legislative support requiring agencies to adopt the state government's geospatial strategy;
- Participants can derive mutual value and benefit from the initiative;
- Direct benefits in the form of start-up funding are available to local government; and
- Open and ongoing communication, consultancy and support.

Relevance to BC

The Integrated Registry Project could benefit from much of the work that Victoria has done in defining and implementing its Geospatial Information Strategy. The work performed in the areas of Custody, Pricing, Access Infrastructure, Metadata, Spatial Accuracy and Awareness would seem to be the most relevant. Moreover, the approach to the established of the partnership between the State government and the 78 local councils is a model that may provide some useful insight for BC's Integrated Cadastral Initiative.

Detailed information about Land Victoria and its initiatives can be obtained from the following Website at www.land.vic.gov.au.

4.4.4 State of Tasmania

Tasmania is the smallest state in Australia and its only island state. It covers an area of 68,000 sq km (<7% of the area of BC), with a population of around 500,000. Given the size of this jurisdiction, it is impressive what has been accomplished. In fact, Tasmania has won numerous awards for its work including the North American Urban and Regional Information Systems Association (URISA) in the Exemplary Systems in Government category.

The Land Information System Tasmania (The LIST) was initiated in 1997 by the Premier of the day as one of a series of new policy initiatives. The purpose of the project was to integrate key cadastral and resource data, and to provide online Web access. The delivery timeframe for the project was short – 2 years at a cost of $2.5M – even though initial assessments were 3 years and a cost of $2.9M. The project involved:

- Negotiation of custodianship and sharing agreements with data providers;
- Acquiring and developing computer systems to compile, manage and deliver data over the Web;
- Working groups to identify data needs and refine data specs;
- Data compilation and maintenance procedures;
- Compilation of 56 datasets (from an original list of 300); and
- Application development for Web-access to title and assessment data.

The LIST Web site was launched in February 1998 and provided the capability to display land title and valuation information in text and image form. Interactive map display of parcel and parcel information plus other key data sets became available later the same year. As more data was added, both national and international interest grew which lead to receiving two prestigious awards in 1999. The front door of The LIST Web portal is shown below in Figure 3.

The LIST achieved many of its objectives in just over 2 years since commencement, and the increasing demand for more information and services has established it as a permanent program within government. The relevance for BC is that projects of this type can be successful if they remain focused on defined scope and outcomes, in spite of time and budgetary constraints.

A final interesting aspect of The LIST is its technology architecture. The LIST is one of the first examples of an operational spatially enabled application based on ESRI's Spatial Database Engine (SDE) and the Oracle database. This architecture is similar to the environment on which Tantalis has been deployed and which is being considered as the underlying architecture for both the ministry's Integrated Data Warehouse Project and the Integrated Registry Project.

More information about The LIST and activities in the State of Tasmania can be found at the following Web address: http://www.thelist.tas.gov.au/.

Figure 3 - 'THE LIST' from Tasmania

4.5 Alberta and Saskatchewan

4.5.1 Alberta Crown Land Administration

Alberta administers Crown land surface rights using an interest-based system. The Public Lands Act of that province provides the Minister of Public Lands the authority to grant surface rights on Crown lands and describes how land rights or dispositions are registered, assigned and transferred.

Section 115 of the Act defines the effect of registration (see the excerpt from the Alberta Public Lands Act in Appendix D). This clause establishes Torrens like principles for the management of Crown land rights. The key principles are:

- Registered rights take precedence over any other rights;
- Rights are transferred by entry in a register (not by transaction); and
- The Crown sets the conditions for registering.

This system of administration of Crown surface rights permits the Government of Alberta to "status" land very quickly. The Alberta government provides land status information to applicants within 4 hours via a toll free number, email or via an online service.

4.5.2 Alberta Subsurface Rights Administration

Alberta administers subsurface rights according to "interest" based principles, as is the case for Crown surface rights. By legislation (see excerpt from the Alberta Mines and Minerals Act see Appendix E) that province establishes a register of subsurface rights. This official record established by law takes precedence over any other transfer of rights. This Torrens like approach to registering interests enables the Province of Alberta to guarantee ownership of rights and provide immediate statusing.

4.5.3 Saskatchewan

Saskatchewan Environment is responsible for administering all Crown resource land in the province. This includes authorization of land use allocations, development of Crown land policies and programs, conducting land use planning projects and administering the department's Treaty Land Entitlement Program.

Agricultural land is administered through Saskatchewan Agriculture and Food. Although some grazing, haying and cultivation activity does occur on resource or provincial forest land administered by Saskatchewan Environment, Saskatchewan Agriculture and Food is responsible for the majority of the land associated with these activities.

The government of Saskatchewan registers interests in Crown rights (coal, minerals, etc.); however, unlike Alberta, the government of Saskatchewan still recognizes

unregistered transfers of rights, although it assigns them lower instrument numbers should a dispute arise. Except for Land Titles, Saskatchewan administers Crown land and resources under a transaction based system.

Private land is administered through a Crown corporation the Information Services Corporation of Saskatchewan (ISC) established on January 1, 2000. The ISC mandate includes the automation of Saskatchewan's paper-based land titles system. The new system will be simpler, more accessible and more responsive, maximizing the use of technology. Consistent province-wide turnaround of 24 to 48 hours for title registration is projected. The new system will also integrate the Geographic Information Systems (GIS) with the Land Titles registry. The corporation is responsible for the administration of land titles and survey legislation.

4.6 Quebec

Information on administration of land and resource rights on Crown lands was not available from Quebec. Preliminary investigations indicate that Quebec like British Columbia and Saskatchewan, administers Crown land and resource rights on a transactional basis. Quebec, however, has embarked on a significant cadastral initiative for the administration of land titles.

The original cadastre in Quebec was produced at the end of the 19th century. It remained unchanged for more than a century, with the 700,000 original lots still represented on the same 1,450 original plans. Subsequent subdivisions of the original lots were, once registered, shown on 350,000 parcel plans that were never transferred to an overall plan and were administered by separate land titles offices. These and other factors, combined with the absence of a formal process for updating the cadastre, gradually created a number of deficiencies in the cadastral system.

For all these reasons, the Quebec government launched a cadastral re-form program in 1985. Six years after work first began, nearly 85% of the initial budget had been spent, but the cadastre had been renewed for only 5% of Quebec's 3.5 million properties. The program was therefore suspended for a complete overhaul.

After the problems had been analyzed and solutions identified, the program was resumed in 1992 on an entirely new legal, technical, administrative and financial basis, while the initial objectives were maintained:

- Provide a full and accurate record of land divisions;
- Ensure that the cadastre is updated; and
- Ensure the versatility of the cadastre.

Quebec's cadastral reform project is now well on the road to success. Renewal work is currently underway, covering 50% of all land under private ownership. In addition, 20%

of the lots to be renewed are now correctly represented and in force in the new cadastral database.

4.7 United States

In the United States most jurisdictions use a combination of private conveyance and registration of deeds backed up by title insurance rather than title registration to support the land markets. Insurance companies operating mainly in one state keep their own land records and insure a title against third-party claims if their records indicate that it is sound. Other than a few states that have implemented Torrens-based title registration systems, most of the states operate some system of deed-based title insurance. Although this system results in lower operating costs for state governments, the end result is that much higher cost and risk is borne by the purchaser of land. Compared to the title registration system, this approach is regarded as expensive (to the purchaser) and high risk.

For public land the responsibility rests with the Bureau of Land Management (BLM) and other Federal agencies such as the US Forest Service. An outline of the BLM follows.

4.7.1.1 Bureau of Land Management

The Bureau of Land Management (BLM) is the agency responsible for administering 262 million acres of America's public lands, located primarily in 12 Western States. The BLM sustains the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

The BLM is in the process of undertaking a major review and alignment of its business and technology and developing an enterprise architecture, known as the 'Bureau's Architecture'. The key drivers for performing this work are similar to those affecting BC and other jurisdictions around the world.

A major objective is to identify and eliminate redundant work processes leading to the collection and management of duplicate information and the haphazard implementation of new technology. The goals of this enterprise-wide process are to:

- Provide convenient access to information and services, both internal and external;
- Deliver timely and effective responses and services to customer requirements;
- Guarantee a reliable communication and computer infrastructure; and
- Effectively manage BLM information/knowledge and technology assets and support BLM human resource assets.

In the course of developing the enterprise architecture nine major business processes were identified that encapsulate all the BLM's work at the highest level. These business

processes cut across organization boundaries and functional areas and are the primary means by which the BLM achieves its strategic mission and goals.

Given the scope of this effort and the stage of the process, there seems to be little of direct relevance to the Integrated Registry Project at this time; however, it may be prudent to key a watchful eye on the progress of this work and the directions that are taken. Of future interest may be the approach taken to generalize the business processes that encompass a wide range of land management activity. This may be useful in helping to establish a framework for rationalizing the various business processes used by regulators in BC to make decisions concerning access and allocation of land and resources.

More information about the BLM generally and this project in particular can be obtained from the following BLM Web address: http://www.blm.gov/ba/.

4.7.1.2 Federal Geographic Data Committee

The Federal Geographic Data Committee coordinates the development of the National Spatial Data Infrastructure (NSDI). The NSDI encompasses policies, standards, and procedures for organizations to cooperatively produce and share geographic data. The 17 federal agencies that make up the FGDC are developing the NSDI in cooperation with organizations from state, local and tribal governments, the academic community, and the private sector.

One of the standards developed by the FGDC is the Cadastral Data Content Standard that provides semantic definitions of objects related to land surveying, land records, and land ownership information. Its purpose is to provide a standard for the definition and structure for cadastral data which will facilitate data sharing at all levels of government and the private sector and will protect and enhance the investments in cadastral data at all levels of government and the private sector.

Though the standard has been developed for the United States, it has applicability in jurisdictions outside the US. For example, Australia used the standard as basis for the development of its National Cadastral Data Model identified above. Consideration of this standard should be given as part of the process of developing an Integrated Registry data model for BC.

4.7.1.3 National Integrated Land System (NILS)

The National Integrated Land System (NILS) is a joint project between the Bureau of Land Management (BLM) and the USDA Forest Service (USFS). NILS will provide a business solution to land managers who face an increasingly complex environment of complicated transactions, legal challenges, and deteriorating and difficult-to-access records.

The BLM and USFS are working in partnership with states, counties, and private industry to develop a common data model and software tools for the collection, management, and sharing of survey data, cadastral data, and land records information. Using geographic

information system (GIS) technology, NILS will greatly facilitate cooperative land management and better decision-making among all land managers.

The vision for NILS is to provide a solution that unifies the worlds of surveying and GIS. Implementing this vision requires a common data model, in-field computing tools, a measurement management engine to analyze survey data, and parcel creation and maintenance tools. This integration of surveying and GIS will provide land managers with a complete field-to-fabric technology solution. NILS is based on commercial off-the-shelf (COTS) GIS tools and consists for 4 components: survey management, measurement management, parcel management and GeoCommunicator.

Because NILS is primarily a technology solution, some or all of its functional components may have applicability in the technical implementation of the Integrated Registry for BC after the detailed requirements have been documented.

4.8 Summary of Selected Jurisdictions

	Integrated Registry[1]	Integrated Crown Land and Resource Records	Transaction Based Registry	Interest Based Registry	Principles Portable to BC	IT Solution Portable to BC	Integrated Provincial Cadastre[2]	Statusing Standards of Performance[3]
Alberta	No	Yes	No	Yes	Yes	No	No	Yes - 4 hours
British Columbia	No	No	Yes	No	-	-	Underway for both	No
Saskatchewan	No	No	Yes	No	-	Possibly	Private only	Unknown
Quebec	No	Unknown	Yes	No	-	Yes for private cadastre	Private only	Unknown
United States	No	No	Yes	No				
Victoria – Australia			No	Yes	Yes	Possibly	Yes	Unknown
Tasmania - Australia			No	Yes	Yes	Possibly	Yes	Unknown

[1] Does the jurisdiction have an integrated register of land and resource rights.
[2] Does the jurisdiction have a digital cadastral system for Crown land, private parcels, or both.
[3] Are there standards of performance for obtaining status information regarding Crown-owned land or resources. Alberta has a published standard of 4 hours through the use of a toll free number or email message.

5. CONCEPTUAL SOLUTION

5.1 Overview of Land Administration

This section provides a summary of the concepts and principles of land administration and land registration systems.

5.1.1 Purpose of Land Administration

The importance of land administration as a key underpinning of a modern society such as BC has often been cited. Effective land administration is vital to our economic, social and sustainable resource development. Land administration systems enable jurisdictions to:

- Operate a secure land market in which land is bought and sold;
- Manage the activities occurring on land, particularly the allocation of rights over the Crown land;
- Establish and implement policies for the use and protection of both the land and its resources (e.g. water, vegetation, minerals, etc.);
- Provide security of tenure to land owners and tenures holders;
- Provide a stable basis for the valuation to serve the fiscal requirements for property taxation; and
- Provide a means of public access to land administration information such as tenure, survey, valuation and other related data.

Land administration is one of the oldest and most established functions of government. In BC, systems to support the development and transacting of land have been in place for over 100 years. While these systems have served the government well over the years, increasing pressure from various segments of society are driving the need to make the supporting institutional structures, processes and systems to be much more efficient and effective. These business drivers include:

- **Economic Development** – Access to services that support that development of land and resources, the transacting of land and access to credit and other financial services provide direct economic benefits to society.
- **Sustainable Development** – Land is becoming increasingly scarce while at the same time there is increasing demand for the use of land, oftentimes in conflict (e.g. economic development, environmental protection, indigenous rights).

- **Urbanization** – The migration of people into urban areas in search of better jobs and a better life is increasing, and they all need a place to live. This poses unique challenges for regional and local governments in planning for the use of land, developing the land and building the necessary infrastructure to house these people.
- **Globalization** – Increasing integration of world economies is forcing nations like Canada and jurisdictions such as BC to reform their economic, sustainable development and social policies and to transform the delivery of its services in order to stay competitive in a global market. Poor access to secure land markets or protracted approvals to develop land and natural resources may result in lost opportunities for BC in favour of other jurisdictions.
- **Technological Reform** – Stunning developments in measurement technology, information technology, communication technology and the rise of the Internet are transforming the way that land administration systems can function. Without ever using a pen, paper, ruler or protractor, it is now technically possible to:
  - Receive an electronic application to acquire rights in land or resources from anywhere in the world;
  - Send electronic notification of the application to other stakeholders for comment;
  - Perform a ground survey using different measurement technologies and electronically receive and update the spatial fabric using the digital survey data;
  - Obtain electronic signatures as evidence of the rights conveyed and register the interest in an electronic database; and
  - View all the details of the interest spatially from a Web browser from anywhere in the world.

5.1.2 Land Registration

Land registration is the process of official recording of legally recognized interests in land in a land register[4]. The official record contains the details regarding the rights and restrictions conveyed to legal persons (individuals or organizations), or of changes in the legal status of defined units of land. The organization responsible for land registration and maintenance of the land register is known as the land registry.

Regardless of the type of land registration system, four important legal principles are generally applied[5]. They are:

- The booking principle – implies that a change in rights on an immovable property (i.e. land) is not legally recognized until the change or the expected right is booked or registered in a land register.
- The consent principle – implies that entitled person who is booked in the land register must consent to a change of inscription in the land register.

[4] FIG Land Administration Thesaurus
[5] Basic Principles of the Main Cadastral Systems in the World, Jo Henssen, Delft, 1995

- The publicity principle – implies that legal land registers are open for public inspection, and also that the published facts can be upheld as being correct by third parties in good faith, so that they can be protected by law. In reality there is considerable variation in the degree of public openness of land registers, according to the nature of freedom of information and privacy protection law in existence across jurisdictions.
- The specialty principle – implies that in land registration, and in the documents submitted for registration, the concerned subject (the person), and the object (the real parcel or property) must be unambiguously identified.

5.1.3 Land Registration Systems

In general, there are two recognized systems of land registration, the deed registration system and the title registration system.

In a deed registration system a deed, which is a document describing an isolated transaction, is registered. The deed is evidence that a particular transaction took place, but is not in itself proof of the legal rights of the involved parties. The deeds registration system is limited in that it doesn't provide a guarantee of title. Nor does it provide the clarity, certainty or guarantee required for an ideal system. All that it typically provides is access into the chain of transactions that can be used to prove title. Before any land dealing can be safely completed, the apparent owner must trace their ownership back to the root of the title.

In a title registration system, a document describing the interest or the right itself is registered, together with the rightful claimant and any associated restrictions and charges. With this registration the title or right is created. The basic unit of registration is the land parcel and generally each parcel is surveyed and may be mapped.

The three generally accepted principles for successful title registration systems are:

- The mirror principle – that the register reflects accurately and completely the current state of the title.
- The curtain principle – that the register is the sole source of information necessary for a purchaser. No further historical investigation beyond the register is necessary (i.e. a curtain effect that blocks out all former transactions).
- The guarantee principle – that the state is responsible for the veracity of the register and provides compensation to anyone who suffers a loss in the event of an error.

The best-known system of title registration is the Torrens system, named after Sir Robert Torrens who introduced such a system into South Australia in 1858. The key features of the Torrens system of title registration are security, simplicity, accuracy, expedition, cheapness, suitability to its circumstances and completeness of the record. British Columbia's system of registering title under the Land Title Act is an implementation of the Torrens system.

5.1.4 Land Tenure

Land tenure relates to the manner by which rights in land and resources are held. It describes the rights, responsibilities and restrictions that attach to the user of land or resources. Land tenure is the manifestation of the relationship between people and the land and its resources.

In BC the main forms of land tenure include private ownership (i.e. fee simple interest as expressed on a Certificate of Title), leases, licenses, permits, easements and rights-of-way. Comprehensive land registration systems need to support a range of tenure forms, including forms not yet recognized, such as the legal recognition of indigenous rights.

5.1.5 Cadastre

A Cadastre is normally a parcel-based, up-to-date land information system containing a record of interests in land (e.g. rights, restrictions and responsibilities). It usually includes a geometric description of land parcels linked to other records describing the nature of the interests, the ownership or control of those interests, and often the value of the parcel and its improvements. It may be established for fiscal purposes (e.g. valuation and equitable taxation), for legal purposes (e.g. conveyancing), to assist in the management of land and land use (e.g. for planning and other administrative purposes), and for enabling sustainable development and environmental protection.

5.1.6 Land Administration Benefits

In general the kinds of benefits to be gained by effective and efficient land administration systems and practices are:

- More security of land tenure;
- Better access to long-term credit;
- Increased utilization and productivity of land and resources;
- Lower transaction costs on the real property market;
- Cheaper information for land administration;
- More equitable and cost-effective collection of land taxes;
- Improved opportunities to implement land policies; and
- Improved opportunities to plan for sustainable development of land and other natural resources.

With respect to the economic benefits of efficient land administration systems, it is interesting to consider studies performed in other jurisdictions. In particular, two studies conducted in Australia are worthy of mention because of their compelling results and also because of the similarities that exist between the Australian jurisdictions and British Columbia in terms of geography and resources, demography, and types of land administration systems and governance structures that support them.

In 1994, the Australia & New Zealand Land Information Council (ANZLIC) performed a cost benefit study into the value of existing land and geographic information. It revealed that for every dollar invested in producing land and geographic data, four dollars of benefit was generated within the economy. In 1990, a similar survey was conducted into the actual benefit of land and geographic data in New South Wales. It concluded that for every dollar invested in the capture of the cadastral (parcel) data, there was nine dollars of benefit to the economy. Similar cost benefit outcomes have been predicted elsewhere in Australia and in other countries.

5.1.7 Key Success Factors

While success may be a subjective term, there are a number of recognized criteria for measuring the actual or potential success of a land administration system[6]. These criteria include:

- **Security:** The system should be secure such that land markets and Crown land disposition processes can operate effectively and efficiently. Financial institutions should be willing to mortgage land quickly and there should be certainty of ownership and parcel identification. The system should also be physically secure with arrangements in place for duplicate storage of records in case of disaster and controls to ensure that unauthorized persons cannot damage or change information.
- **Clarity and Simplicity:** To be effective, the system should be clear and simple to understand and to use. Complex forms, procedures, and regulations will slow the system down and may discourage use of the system. Simplicity is also important in ensuring that costs are minimized, access is fair, and the system is maintained.
- **Timeliness:** The system should provide up-to-date information in a timely fashion. The system should also be complete; that is, all parcels should be included in the system.
- **Fairness:** In development and in operation, the land administration system should be both fair and perceived as being fair. As much as possible, the land administration system should be seen as an objective system separated from political processes, such as land reforms, even though it may be part of a land reform program. Fairness also includes providing equitable access to the system through, for example, decentralized offices, multiple agencies, simple procedures, and reasonable fees.

[6] From FIG Statement on the Cadastre

- **Accessibility:** Within the constraints of cultural sensitivities, legal and privacy issues, the system should be capable of providing efficient and effective access to all users.
- **Cost:** The system should be low cost or operated in such a way that costs can be recovered fairly and without unduly burdening users. Development costs, such as the cost of the adjudication and initial survey, should not have to be absorbed entirely by initial users. Low cost does not preclude the use of new information technologies, as long as the technology and its use is appropriate.
- **Sustainability:** There must be mechanisms in place to ensure that the system is maintained over time. This includes procedures for completing the system in a reasonable time frame and for keeping information up-to-date. Sustainability implies that the organizational and management arrangements, the procedures and technologies, and the required educational and professional levels are appropriate.

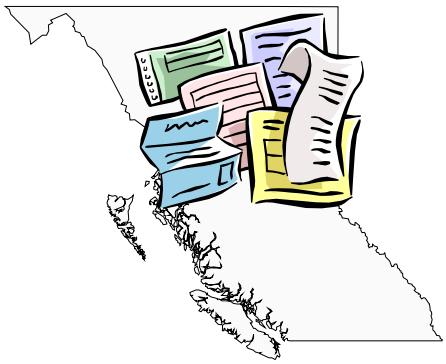
5.2 Integrated Land and Resource Register for BC

This section articulates the overall vision and solution for an integrated land and resource register for BC. This vision is a "new" vision that reflects the work that was done with stakeholders during the course of this work.

In adopting a new vision, British Columbia will fundamentally change how it officially records land and resource encumbrances. This change, along with the associated electronic tools, provides the business benefits described in the following vision statement. The changes are depicted in the following illustration showing the difference between transaction-based and interest-based administrative systems.

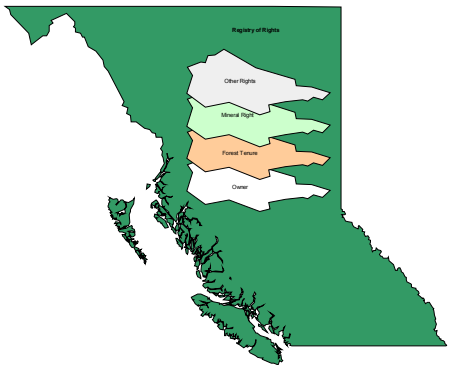
Figure 4 - Current and Future Land and Resource Administration

Transaction Based Records



- **Many ways to record transactions**
- **No overall standard for recording interests**
- **Difficult and time consuming**
- **Expensive**
- **Not accurate**
- **Impedes economic development**

Interest Based Spatial Records



- **One way to record interests**
- **Standards based**
- **Simple**
- **Inexpensive**
- **Accurate**
- **Expedient**

5.2.1 New Vision

> *The vision of an integrated land and resource registry for BC is a spatially enabled, efficient and accessible electronic register of all legal interests in Crown and private land and resources, which serves the business needs of a diversity of users and clients.*

Use of the word *register* implies that it is the 'official record' of legal interests and Crown and private land and resources, and supersedes all other former registers or official source documents.

An *electronic register* is an information resource implemented as an electronic database or series or databases containing spatial, attribute, document and image data. *Efficiency* and *accessibility* are characteristics that require the information in the register to be current, complete, accurate, understandable and easily accessible from tools such as a standard Web browser.

In a *spatially enabled* register, all parcels and interests are represented in a seamlessly integrated geo-spatial fabric, and tightly integrated with associated attribute, document and image information. This level of integration enables a user to zoom to a parcel in a spatial context and to view associated textual or image information, such as tenure holder, type of tenure, rights, responsibilities or restrictions. Conversely, a user could also

view, in a spatial context, all parcels of a particular tenure type or all interests held by a particular tenure holder.

A *register of all legal interests in Crown and private land and resources* contains information about all legal interests in land and resources granted by the Crown. This includes rights granted under the Land Act, Land Title Act, Forest Act, Water Act, etc. This provides users and clients with certainty that the nature and extent of all interests pertinent to an area of land can be accessed from a single location and that they do not need to access other sources in order to confirm the complete legal status of a parcel.

*Serving the business needs of a diversity of users and client*s means that the functions and services provided by the integrated land and resource register are client-driven, with recognition that a broad range of business needs, users and clients must be served.

5.2.2 Objectives

The objectives for the Integrated Registry Project fall into four broad categories: economic development, sustainable development, government efficiency and customer service.

Table 6 - Integrated Registry Project Objectives

Category	Objective
Economic Development	• Enable faster decisions and access to Crown land and resources • Leader in e-Government • Reduce land-use conflict • Competitive advantage is gained for British Columbia in obtaining new developments • Contributes to better and faster resolution of First Nations issues
Government Efficiency	• Reduce costs and risk of error or uncertainty associated with confirming the legal status of land • Reduce costs associated with collecting and maintaining land and resource registry information
Sustainable Development	• Support improved decision-making for large development projects, land use planning activities or First Nations treaty processes • Support improved land use policy-making to ensure sustainable development of land and resources
Customer Service	• Enable improved client service to all owners, users or regulators of land and

Category	Objective
	resources • Provide leadership in electronic service delivery

The overarching objective of the integrated land and resource register is to significantly reduce or eliminate the inefficiencies and uncertainties in determining the legal status of land. By way of direct and related comparison, confirming the legal status of land should be as simple as performing a land title search to verify the existence of a fee simple interest, the current owner of that interest and any associated charges.

5.2.3 Scope

The Integrated Registry Project is intended to support the continued automation and integration of land records information for Crown and private land and resources. The information systems, standards, tools and services produced as outcomes of the project must be useable by the public, all government agencies and private sector organizations actively involved in performing land administration as part of their business, or who require access to land records information to support their business ventures.

The geographic scope of the project includes the entire province of British Columbia. The information scope of the project includes all types of legal interests and encumbrances in land and resources granted by the government over Crown or private land.

The functional scope includes the processes, procedures and services required to accurately record, maintain, secure, and facilitate access to the integrated register of land and resource interests and encumbrances. This includes electronic interfaces to any source feeder systems (e.g. Tantalis), or interfaces to systems for which the Integrated Registry is the source (e.g. Integrated Data Warehouse).

5.2.4 Key Principles

The following are the key principles upon which the design of the integrated land and resource register should be based.

- The register is the official record of all interests granted by the Crown for the use of Crown land and resources. If an interest is not identified in the register, then it is deemed as not in existence.
- The principles that apply to the registration of titles in BC's Torrens-based, title-based system shall apply to registration of Crown land. This includes the mirror principle, the curtain principle and the guarantee principle as described above.
- The register will show the complete legal situation (or status) of land, including rights and restrictions over Crown land as well as private land[7]. To achieve this the

[7] Consistent with Statement 1 of Cadastre 2014

register will strive to ensure that information is as current, complete and understandable as possible and that data errors (i.e. inaccurate or inconsistent data) are minimized.

- The register will contain geo-spatial, attribute, document and image information that is brought together based on an integrated geo-spatial data model. There will be no physical separation between mapping information, textual information and document information[8].
- Hard copy maps will cease to be a primary means of information storage[9]. The electronic register will become the primary means of storing mapping information by means of geo-spatial data models. The production of hard copy maps will be used for representational purposes rather than information storage purposes.
- Private parcel and Crown parcel information will form the underlying spatial fabric of the register. This underlying fabric will cover the entire province in a seamless, continuous and integrated manner and serve as the fundamental basis for integrating or linking other information.
- The integrated land and resource register represents the fundamental relationship between a tenure holder, the area of land over which rights are held and the specific rights, responsibilities and restrictions held. The register does not store operational information about the processing of applications for land or resource use.
- Custodianship principles shall apply to the maintenance of registry information. For each thematic layer in the register, a named custodian shall be responsible for the description, capture, maintenance, quality and access of that layer, according to acceptable custodial practices and guidelines.
- The integrated land and resource registry recognizes and respects the roles of regulators and their legal or statutory decision-making responsibilities in the disposition and management of land and resources. However, some legislative reform and clarification of roles and responsibilities between the regulators and the registry may need to occur from time to time.
- The integrated land and resource register is not something that will automatically produce good land use decisions or acceptable land development. It is not in itself a system that defines land policy, legislation or land tenure. It is a system for methodically recording land and resource tenure situations that can be used to support land use decision-making processes, or the shaping or reforming of land policy and legislation.

5.2.5 Components of the Integrated Land and Resource Register

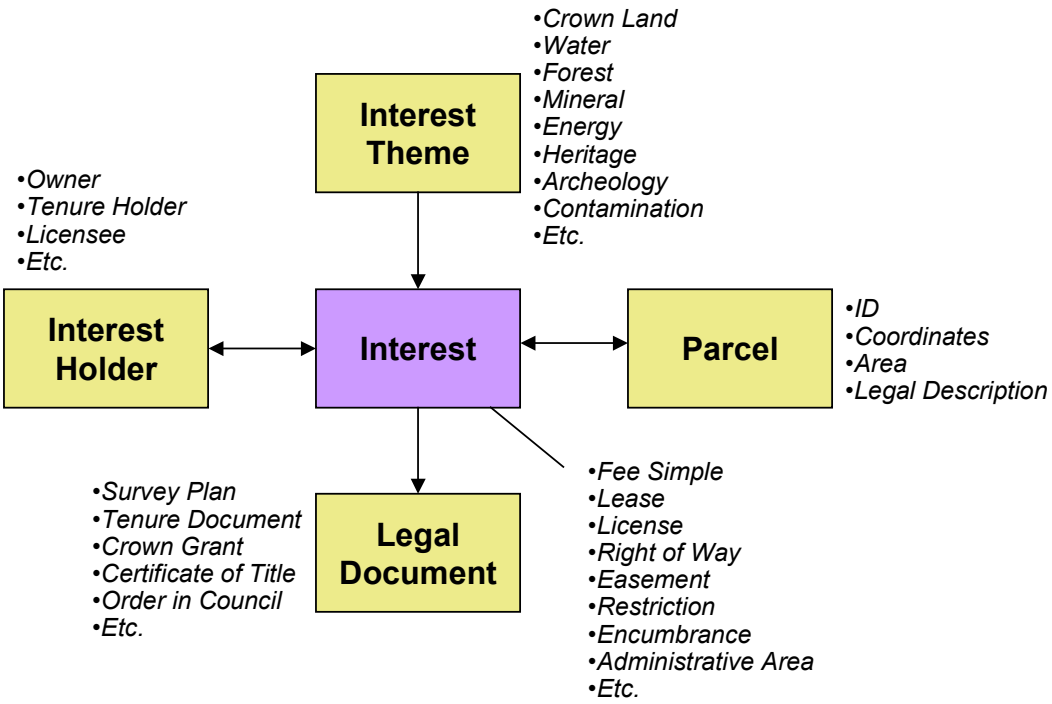
For the purposes of this section information for the administration of land and resource rights falls into two categories: a description of the right or interest (location, theme, holder, shape and legal reference) and administrative details (history, payments, fees, field conditions, etc.). A land register in this context is the subset of this information that describes the right and its physical extent and ownership. It does not include the administrative detail that is necessary for the management and regulator functions of the government.

[8] Consistent with Statement 2 of Cadastre 2014
[9] Consistent with Statement 3 of Cadastre 2014

5.2.6 Core Data Components

The core data elements or entities in the integrated register are quite simple. At the highest level of abstraction the integrated register establishes the fundamental relationships between an interest holder (a person or organization who holds rights in land or resources), a parcel (the defined area of land over which an interest holder holds those rights), and the interest itself (the specific rights, responsibilities and restrictions held by the interest holder for that specific parcel of land). These fundamental data entities and the relationships are shown in the diagram below.

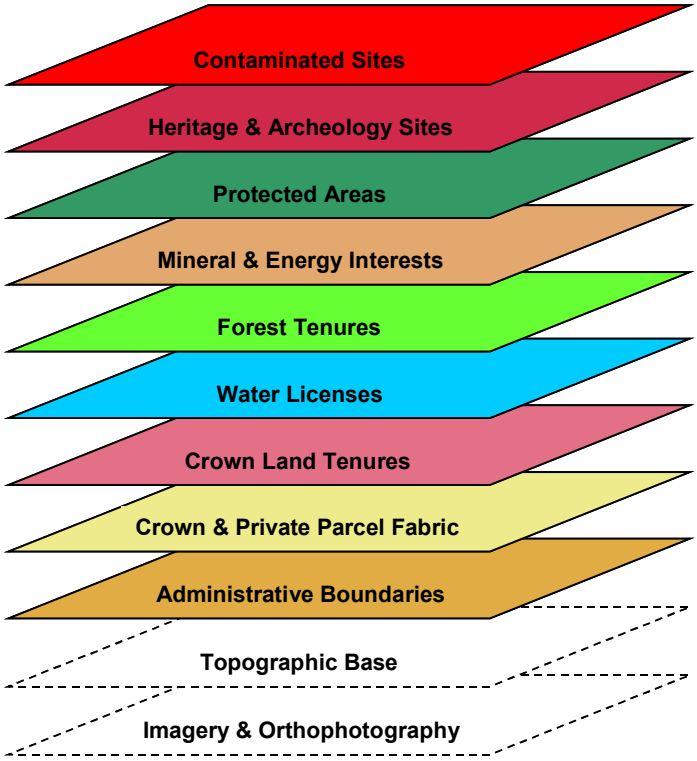
Figure 5 - Core Data Components



For completeness, two other key entities are defined in addition to the interest holder, the parcel and the interest. These are the legal document and the interest type.

The legal document relates directly to the interest and forms the legal basis for defining and creating the interest. It contains the legal description of the rights, responsibilities and restrictions associated with the interest. The capability to access a legal document is important to understand precisely what rights conveyed to the tenure holder such as sub-surface mineral rights, rights to cut timber, or in some parts of the province, rights to the beds of lakes or streams.

Figure 6 –Thematic interest layers



The interest theme defines the type of interest, such as Crown land, water or forestry. As with most geo-spatially enabled systems, information is organized in overlapping layers or themes. The interest theme defines the geo-spatial layer in which interests of that type are contained. This way of organizing the layers is important because it allows for ease of viewing interest layers, and adding new layers over time if new types of interests need to be recorded in the registry. More importantly perhaps is that each layer is the responsibility of a custodian who maintains the interest layer based on agreed standards on behalf of the Province. The following diagram shows a breakdown of the different geo-spatial themes or layers of interests that make up the register.

In the above diagram the bottom two layers (topographic base and imagery / orthophotography) are shown to illustrate the spatial or vertical integration required by the Integrated Register, even though they would not be part of the Register. As base mapping layers, it's anticipated that storage and access would occur from another source, such as the Integrated Data Warehouse (see Figure 6). Common geo-referencing and data access standards will be required to ensure the vertical integration of the interest layers stored in the Register with the base mapping layers stored elsewhere.

5.2.7 Core Business Functions

The core business functions performed by the integrated register[10] are:

- **Identify and delineate parcels**
  This key function has two components: the unique identification of parcels and the spatial definition of the location and extent of parcels. In the current environment each system has its own means of identifying parcels. These include PINs (Tantalis), PIDs (Land Titles), legal descriptions, plus other business-specific identifiers such as File Number (Tantalis), Jurol # (Assessment), Site # (Site registry), etc. Many parcels have multiple business identifiers such as PINs and PIDs. For the integrated registry a key decision will need to be made regarding the range of parcel identifiers to be supported and whether a global parcel identification scheme should be established.

  Locating parcels spatially can take a variety of forms ranging from a textual description of the parcel boundaries (i.e. metes and bounds), to a series of lines drawn on a map, to a field survey. The growth of measurement technologies and methods, such as electronic theodolites and GPS together with computing technology, enables the spatial definition of parcels to occur more efficiently and more accurately. Standards will be required to ensure that recording the location and extent of parcels in the registry occurs in a timely, predictable and consistent manner regardless of the method of spatial capture.

- **Identify the interest holder**
  Identification of the interest holder is also a key function of the register. Two types of interest holders need to be recorded: persons and organizations. Sufficient information must be recorded about the interest holder in order to authenticate that the interest holder recorded is indeed the interest holder claiming rights. For persons this might include details such as social insurance number or other identification numbers, along with name, date of birth, and address. It must be recognized, however, that protection of privacy legislation may work against the building of an accurate and fraud-proof register. Organizations are conceptual entities and, therefore, details such as the incorporation identifier from the Companies Registry would be required.

[10] Adapted from Jude Wallace (1999), A Methodology to Review Torrens Systems…

Other than the BC Companies Registry, there is no single source of client information for government, and there is no shared source of interest holder information across the agencies or regulators involved in land administration. Each maintains its own client file or database with the result that an organization such as BC Hydro, because of its extensive demand for land and resources to generate, transmit and distribute electricity to all corners of the province, exists on the client files of most of the land administration agencies With the integrated register there may be opportunities to establish a tenure holder file that could be used by the land administration agencies.

- **Identify the interest**
  Identification of the interest is the third corner of the parcel-interest holder-interest triangle. In addition to recording the specifics about the nature of the rights, responsibilities and restrictions conveyed by the interest, it will be necessary to record the time and date the rights became active. This is essential in being able to resolve competing claims.

- **Assert the protection of interests**
  Registration of an interest increases the ability to protect that interest against third-party claims. The act of registration creates the interest and converts it into a right that can be protected against any other claim.

- **Verify the existence of interests**
  As part of the adjudication process for a land or resource disposition, verification of conflicting or competing interests must occur. This is typically what occurs during land statusing and is the most compelling reason for building an integrated land and resource register in the first place. Using the integrated register it ought to be possible to examine all the interest layers in a particular area to confirm the existence and type of other legal interests. The decision about whether existing interests are in conflict or competition with the application area under consideration will be determined by regulators, based on interpretation of statute, legislation or land policy.

  The same basic procedure for verifying the existence of interests should apply over small areas of land (e.g. a single parcel) and large areas of land (e.g. to support land-use planning or treaty processes). Since the complete set of rights, responsibilities and restrictions for each interest are known and held with the interest, it should not be necessary to search back through a chain of transactions to understand the complete legal status of the land. This is a key objective of the integrated register and, if accomplished, will greatly improve the efficiency and certainty in confirming legal status.

- **Verify interests held by interest holder**
  An extension to the statusing function described above is to verify interests held by the interest holder. In private land transactions this is typically what occurs during a title search where it is necessary to verify that the person conveying ownership rights to another is the person who is registered on the certificate of title for that property.

  When performing a status on Crown land it is often necessary to know details about the interest holder. This can become quite complicated because there are many agencies of government (provincial and federal) who hold interests in Crown Land (e.g. Ministry of Transportation or Federal Department of Indian Affairs). In this respect government agencies are regarded more like private interest holders even though the Crown holds ownership rights to the land. Responding to the simple question 'Show me all the Crown land in the province' is far from straightforward because it requires searches to be performed for each Crown agency holding interests in Crown land.

- **Provide proof of registration**
  This function provides the interest holder with proof of registration. This proof could take numerous forms including a notation on the interest indicating the registration number, a receipt for payment of registration fees (if applicable), or a certificate or report of the electronic record supported by electronic signatures.

5.2.8 Clients

The following table lists the clients to be served by the integrated land and resource registry.

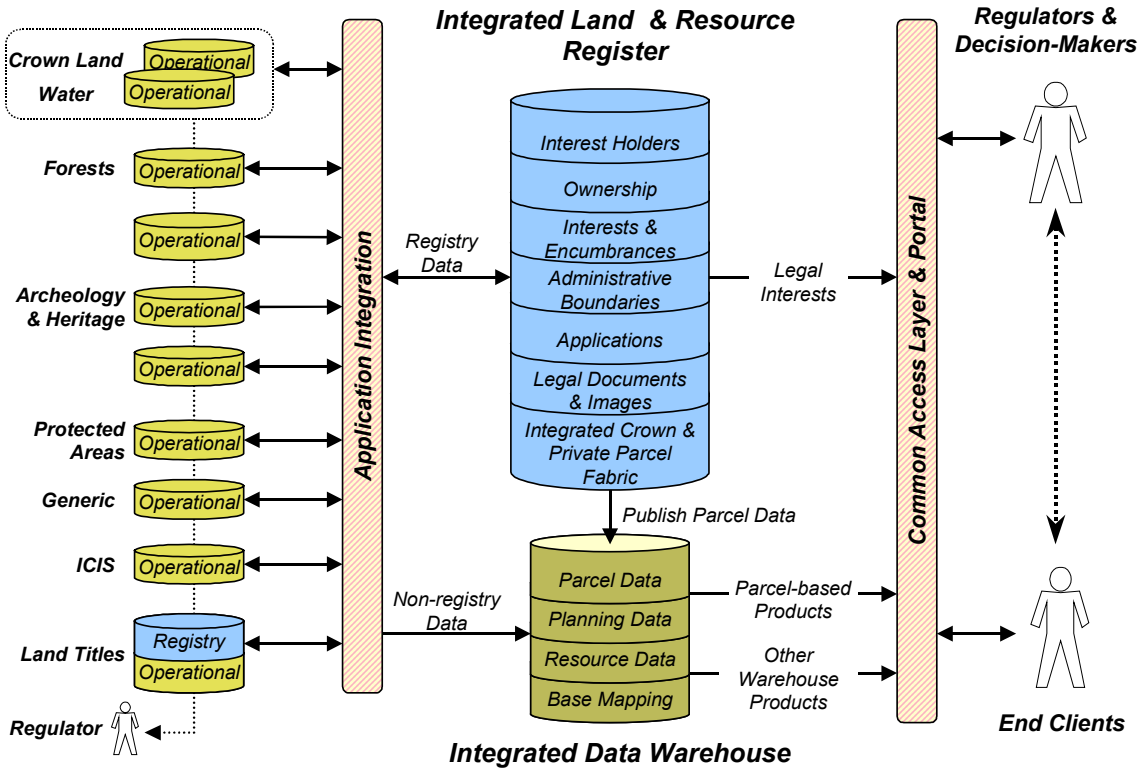
Table 7 - Registry Client Groups

Client Group	Sub-groups
Regulators	• Land & Water BC • Ministry of Forests • Ministry of Energy and Mines • Oil and Gas Commission • Ministry of Water, Land and Air Protection • Ministry of Sustainable Resource Management
Decision Makers	• Treaty Negotiations • Land Use Planning • Resource Use Planning • Transportation Planning
End Clients	• General Public • Regional & Local Governments • Private Land Owners • Tenure/License/Permit Holders • Industry Groups – Forest, Range, Land, Oil and Gas, Mines, Fish, Water • Professionals Groups – Land Surveyors, Archaeologists, Lawyers

5.2.9 Target System Architecture

The following diagram illustrates the overall system context in which the Integrated Land and Resource Register must operate relative to clients and end-users, regulator-managed operational systems and the MSRM Integrated Data Warehouse.

Figure 7 - Target Conceptual Architecture[11]



The Integrated Land and Resource Register is a spatially enabled data resource containing the official record of interests, rights and encumbrances for Crown and private land. It contains information about:

- **Interest Holders** – Identifies private landowners, Crown agencies, tenure holders, licensees, and possibly information about applicants from submitted applications. Over time this should become the global source for interest holder information used by all provincial land and resource regulators.
- **Ownership** – Identifies if land parcels are Crown or privately owned. This will enable responding to queries such as:
  - Is parcel Crown or private?
  - Find/show all Crown parcels within a particular area;
  - Find/show all Crown parcels held by Ministry of Transportation; and
  - Find/show all parcels owned by other agencies and crown corporations.

[11] This diagram is representational only. The Ministry of Sustainable Resource Management will detail the technical architecture once the detailed requirements analysis proposed for the next phase of the project is complete.

- **Interests and Encumbrances** – Record of all legal interests granted by the government or legal encumbrances affecting the disposition or use of land and resources. Recorded interest information includes the geo-spatial location together along with specific details about the rights, responsibilities and restrictions conveyed to the interest or tenure holder, or the location and nature of encumbrances.
- Major types of land and resource interests include:
  - Fee simple interests (i.e. private land);
  - Crown land interests under the Land Act;
  - Forestry and range related tenures under the Forest & Range Acts;
  - Water licenses and rights under the Water Act
  - Sub-surface mineral and energy rights under the Mineral Tenure Act, Coal Act or Oil and Gas Commission Act; and
  - Protected areas, reserves, designations and land use zones established through legislation; and
  - Roads and highways.
- Categories of encumbrances include:
  - Archeology and heritage sites; and
  - Contaminated sites.
- **Administrative Boundaries –** Delineations established by different government agencies (provincial, federal and municipal) that result in subdivision of the province into regions for the purpose of managing organizational responsibilities and decision-making in relation to the land, resources or population, or controlling land and resource use. Major types of administrative boundaries that should be included are:
  - Agricultural Land Reserve;
  - Assessment Areas;
  - Provincial Electoral Districts;
  - Indian Reserves;
  - Land Districts;
  - Land Title Districts;
  - Land Management Regions;
  - Municipal Boundaries;
  - National Parks;
  - Provincial Parks;
  - Ecological Reserves established by Order in Council;
  - Regional District Boundaries;

- School Districts;
- Protected Areas;
- Special Management Areas (e.g. Muskwa-Kechika);
- Treaty Settlement Areas (e.g. Nisga'a);
- Forest Regions & Districts;
- Provincial Forest Boundaries; and
- Inter-provincial and International Boundaries.

- **Applications** – Key information about the accepted applications for land or resource use is required for land statusing. Information about applications should include:
  - Location and extent of the application area of interest;
  - Purpose of the application (e.g. Crown land lease, timber cutting permit, water license, etc.); and
  - Applicant details (may be required for notification purposes).

NOTE: Further discussion needs to take place about whether application information should be included at all in the Integrated Register. While the need is recognized for land statusing, an application is not a legal interest until it is properly registered. Placing this information in the registry prior to adjudication violates both the booking and consent principles identified earlier. Application information is also regarded as operational information collected and managed by the regulator. Regulators have identified their desire to publish operational data to the integrated data warehouse. This may provide an alternative means to access application information to support statusing without having to violate the principles of the Integrated Register.

- **Legal Documents and Images –** The basis for the registration of interests in the Integrated Register. They may contain detailed information about location and definition of parcel boundaries (e.g. a registered Survey Plan), or details of the rights, responsibilities and restrictions associated with an interest (e.g. Crown Grant, Tenure Document or Certificate of Title). Legal documents are important for land statusing and should be made accessible to users by scanning the original source documents and making the digital images viewable or downloadable.
- **Integrated Crown and Private Parcel Fabric –** The underlying cadastral layer consisting of a seamless, continuous and integrated geo-spatial fabric of all Crown and private land parcels in the province. The integrated parcel fabric is assembled from various sources such as survey plans and parcel data sets compiled by municipalities, regional districts and utility companies. Because the sources vary in terms of the methods, accuracy and precision used collecting the data, considerable effort is expended in reconciling and rationalizing parcel boundary discrepancies and ensuring that the resulting parcels are accurately attributed. These key identity attributes are used as a basis for linking datasets.

5.2.10 Relationship with Regulator Operational Systems

The Integrated Land and Resource Register will result in separation or disentanglement, of registry information from the operational information used by regulators in the processing of applications for land and resource use. Registry information describes the 'what', 'where' & 'who' for registered interests.

In the current environment, each regulator manages one or more operational systems that store the information necessary for processing applications. This has resulted in the entanglement of registry information and operational information in varying degrees depending on the regulator.

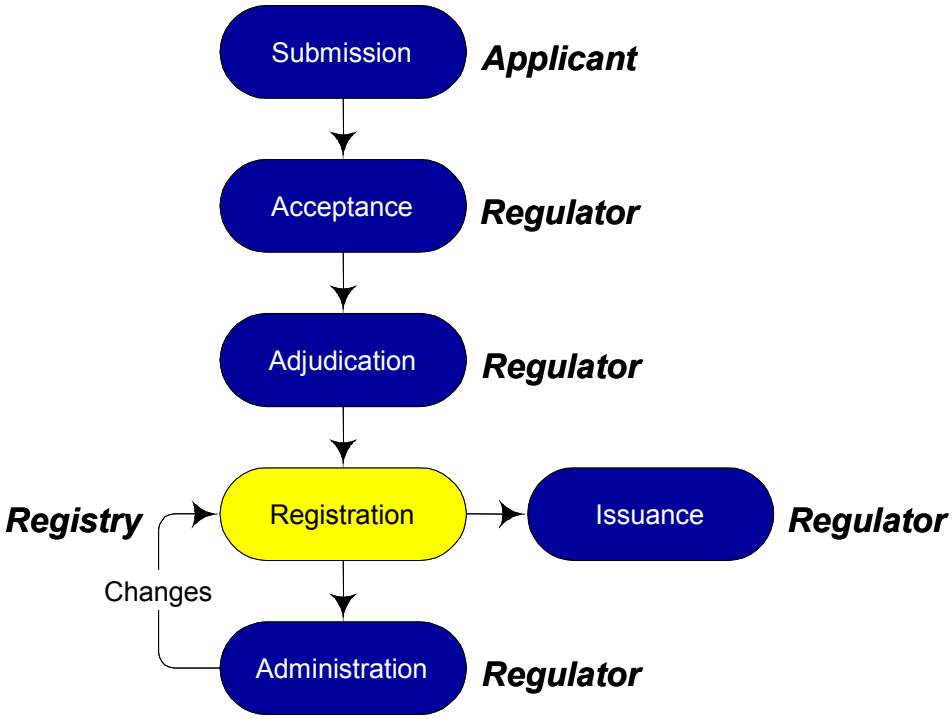
In the proposed environment, each regulator (e.g. LWBC, MOF, MEM) will retain autonomy in managing their operational information and evolving their operational systems to best support their business needs; however, the registration of land and resource interests will become the purview of the Integrated Register. With the exception of the Land Titles system, the registry information is a comparatively small component of regulator systems since it is only focused on documenting what rights were conveyed to whom in what location.

Regulator systems contain information such as the term of a right and the conditions that must be met for a holder of a right to hold that right or interest in good standing. Since in an interest-based registry system the register conveys the right, it then falls on the regulator to remove or cause to have removed those rights from the register that are expired or no longer valid and hence extinguishing the existence of that right.

5.2.10.1 Lifecycle of an Application

The following diagram (Figure 8 - Lifecycle of Generic Land or Resource Application) illustrates the major activities and responsibilities in the lifecycle of a generic land or resource application leading to the registration of an interest.

Figure 8 - Lifecycle of Generic Land or Resource Application



In the above diagram acceptance and adjudication of an application are the operational responsibilities of the regulator, while registration of the interest resulting from the adjudication decisions is the responsibility of the registry. Issuance of land or resource rights by the regulator follows the act of registration. In addition, ongoing administration of the interest by the regulator (e.g. tenure review, rental collection, etc.) may result in changes to the original rights that will require registration.

To maintain the high degree of quality and integrity required for an official record, the registration protocols for recording information in the Integrated Register should be formal, standardized and timely. Software interfaces to integrate and synchronize the data and functions between the operational applications and the Integrated Register will be required to accomplish this in a highly automated fashion.

5.2.10.2 Component Sharing

The Integrated Register should also enable the efficient sharing of components among the regulator systems. An obvious opportunity in this area is the establishment of a single register of interest holders for use by all regulators. Currently, each regulator manages its own file or database of interest holders, with the result that a large organization, such as BC Hydro, that has significant land holdings, is stored in each of the regulator systems in a multitude of different formats. This makes it very difficult to construct a query to determine all the land interests held by BC Hydro and to obtain a reliable result.

Contemporary application integration software (e.g. webMethods) would enable synchronization and rationalization of separate regulator client files with information held in the Integrated Register. Over time, the single interest holder file in the Integrated Register could eventually replace the separate client files.

5.2.10.3 Rationalization of operational systems

The Integrated Register should not be an obstacle in the rationalizing or redesigning of the operational systems managed by the regulators. On the contrary, the Integrated Register should support the merging of operational systems – such as water and Crown lands – to gain operational efficiencies, or the redevelopment of the Forest Tenure Administration System (FTAS).

5.2.10.4 Integration with Land Titles System

The Land Titles System is a special case since it is largely a registry system with a small operational component, the opposite of the other regulator systems. Furthermore, as a title-based Torrens system, the Land Titles system exemplifies types of principles that will guide the development of the Integrated Registry. It will be a major accomplishment if the Integrated Registry can deliver a complete status with the same ease, speed and efficiency that the Land Titles system can perform a title search. A major issue to be addressed in this province is the accurate recording of land and resource interests over Crown land, not on private land.

Since the Land Titles system is mature, generates significant revenue for the province through BC Online, and is key to supporting the private land market in BC, it makes little business sense to perform extensive renovations on the system to decouple the registry components and rebuild them in the Integrated Register. A preferred approach to provide the kind of 'single window' access to interests and encumbrances on Crown and private land is through the use of application integration tools such as webMethods. Using these tools, the Integrated Register could extend into the Land Titles system and effectively provide a single virtual registry for Crown and private land. In this way the Land Titles Registry would continue to support the business of private land dealings with minimal interference or interruption.

5.2.10.5 Relationship to Integrated Data Warehouse

The Integrated Data Warehouse (IDW) addresses the need for standardized access to a wide range of information to address the decision support needs of a broad base of clients. It contains integrated information published from diverse sources and includes land-related resource data, parcel-based data, planning data and base mapping data.

Parcel and interest information is required to support business needs of clients beyond the operational land statusing needs of regulators. Land parcel information has been a key dataset identified by resource planners, managers and professionals in the development of

land and resource management plans, or in the negotiation of Treaties with First Nations[12]. Given the length of time it takes to achieve consensus on a land use plan or to negotiate a Treaty, the requirements for currency and granularity of parcel data are less significant than for operational land statusing where currency and fine-grained detail are important.

The IDW is the logical place to support the needs of clients requiring more generalized access to parcel and interest information to support these requirements. This information could be published to the data warehouse at regular intervals from the Integrated Land and Resource Register. The publication process could involve generalizing or 'productizing' the information, possibly in combination with other resource or base mapping data, to serve specific needs of different client groups. Because parcel data becomes just another theme, layer or dataset in the IDW, clients could benefit from the whole range of services (e.g. standardized access to integrated data, security, discovery, e-commerce, etc.) provided by the IDW.

The Integrated Register greatly simplifies the sourcing of parcel-based information into the IDW. The Integrated Land and Resource Register provides a single integrated, consistent source of parcel and interest data for publishing into the data warehouse. A major benefit of this is that IDW does not need to connect to the disparate registry databases and resolve all the discrepancies and anomalies with the data.

5.2.10.6 Standardized Access

The Integrated Land and Resource Register should support the same common access standards, protocols and tools as the IDW. Use of these standards and tools would enable regulators to perform operational land statusing from a spatially enabled, web-based application that simultaneously accesses information from both the Integrated Register and the IDW. Such an application would enable legal interests in land and resources to be accessed from the Integrated Register, while non-legal interests (e.g. resource related interests), base mapping and orthophotography could be accessed from the IDW in a seamless and integrated manner.

5.2.10.7 External Linkages

An important characteristic of an interest-based integrated register is its external linkages. In fact, the value of the register is based on the strength of those linkages. In the case of this register some of these linkages will include:

- Integrated Cadastral Information Society who own the cadastre that the registry is dependent on;
- Ministry of Energy and Mines Map Staking project that will interact with the register in real time to automate the issuance of mineral claims;

[12] See Statement of Requirements, Integrated Data Warehouse Project, MSRM, 2002

- Ministry of Forests FTAS project that will use the register in managing forest tenures;
- Timber companies that will use the register to determine ownership and availability of land and resources;
- Land Surveying professionals that will interact with the register on a daily basis in conducting their business; and
- Oil and Gas companies in determining land and resource ownership for use in developing existing and new reserves.

These are examples of linkages that will streamline government and private sector processes that involve land and resources.

5.3 Data Management Implications

The following section discusses some general principles concerning data custodianship and data quality management as might be applied to the Integrated Registry.

5.3.1 Data Custodianship

Parcel-based data can be used for a great variety of purposes and a growing list of new applications. Until now, agencies historically have been left to collect data in their own way and to meet their own needs. Naturally this leads to costly duplication of data, data systems and inconsistency between data sources. It also results in data that cannot be integrated with other data to produce value added products. Using data that has been collected for one purpose (geology for minerals exploration) in another application (geology for water supplies) is cost efficient. To take full advantage of this principle the information must be consistent, to acceptable standards, its existence widely known and it must be accessible.

The Integrated Land and Resource Registry, in conjunction with the Integrated Data Warehouse, will provide the institutional and technical framework to ensure the required data content, consistency and coverage to meet the needs of the ministry's clients and stakeholders. These projects should also ensure that all data collection and maintenance efforts are undertaken in the broad interests of all possible uses and users, to maximize investment in data collection and maintenance.

A key component of the institutional framework is the concept of data custodianship. A custodian will be accountable for the collection and management of one or more of the datasets making up the Integrated Land and Resource Registry.

The following custodianship principles have been adapted from the Data Custodianship Guidelines published by the Australia and New Zealand Land Information Council

(ANZLIC)[13]. Further information outlining the rights and responsibilities of custodians is provided in Appendix F.

It is also recognized that any custodianship guidelines pertinent to the Integrated Registry Project need to be closely aligned with other ministry custodianship initiatives emerging from the IDW project by Information Management Branch.

5.3.2 Data Quality Management

Actively managing the quality of data in the Integrated Registry will be key in establishing the level of user confidence, certainty and reliability required for its ultimate success. Data quality has been identified as being the most significant issue to be addressed by the Integrated Registry project. Without some framework for understanding what data quality management is all about and the major activities and sequence required to implement a data quality management practice, the task may become too overwhelming.

This section describes some of the most important data quality characteristics to be addressed by a data quality management plan and as well as a high-level process model and outline of the major data quality management activities (see Appendix G for a description of the Data Quality Management Process).

5.3.2.1 Data Quality Characteristics

Accuracy – This is the degree to which data accurately reflects the real-world objects being described. As such, accuracy is the highest measure of information quality. In geo-spatial systems such as the integrated registry, spatial accuracy is the degree to which recorded geo-spatial locations – point features, lines and polygonal features such as parcels – accurately reflect their real-world locations. Errors leading to inaccurate data can be introduced in a variety of ways, such as incorrect filling out of forms and fields, incorrect survey measurements or inappropriate methods for collecting information. Measuring accuracy involves validating the data values with the real-world objects being represented.

Completeness – This is the degree to which a data record has all required values for data fields (e.g. date of birth filed for an interest holder), or that records actually exist in the database that reflect real-world objects. Measuring the completeness of required values for data fields involves assessing the proportion of records that have a non-null value for a specific field. Measuring the completeness of records relative to the existence of real-world objects (e.g. the existence of parcels) is much more difficult.

Consistency – This applies to replicated or distributed data. It is the degree to which data in one database is semantically equivalent or consistent to data about the same object in another database (e.g. land parcels, interest holders). Semantic equivalence means that

[13] Guidelines for Custodianship, ANZLIC

data values are conceptually equal. For example, a flag with a value of 'T' in one database has the same meaning as a flag with a value of 'Y' or '1' in another database. Measuring consistency involves assessing the proportion of records in one database that are semantically equivalent to the corresponding fields within another database.

Definition – Data definition quality refers to information that defines and describes the meaning of the real-world objects recorded in the integrated registry, such as survey parcels, interest parcels and interest holders. This descriptive information (also known as metadata or data definition) describes the name, meaning, valid values and business rules to manage the conformance of the data records to the real-world objects being represented. An important component of data definition quality is the development of standards and specifications that clearly prescribe the requirements for defining and describing both the content (i.e. meaning) and the structure of the data.

Definition conformance is the level of consistency between the meaning of actual data values and its definition. It is the degree of agreement between the meaning assigned to data by business domain experts (e.g. ministry staff) and its official definition. It highlights the importance of a strong and well-communicated data definition process

Uniqueness – Is the degree to which there is a one-to-one correlation between data occurrences or records and the real-world phenomena being described. Measuring uniqueness involves assessing the proportion of records that are duplicates of other records within a dataset. Uniqueness does not mean records having identical values, rather, that there are two or more records attempting to describe the same real-world event or object. For the Integrated Registry, uniqueness issues may exist for those parcels created in both the Land Titles system and Tantalis (i.e. parcels having both a PIN and a PID).

Currency – This is the time lag, also known as latency, between when data is knowable (i.e. created or changed) in one system, and when it is knowable in another system. This also extends to include the length of time from when a fact is first known (e.g. a tenure document has been issued by a regulator) to when it is recorded electronically in a database (e.g. the parcel reflecting the tenure is updated in the spatial fabric). Accurate land statusing requires as close to zero latency data as possible to provide the level of user confidence and certainty required.

Resolution – This relates to the level of detail or granularity with which data records reflect real-world objects, and is the result of the measuring techniques used to record the data. For spatial data, the resolution achieved by digitizing lines on a small scale map will be much less than that achieved by using more precise field surveying techniques. For spatial raster data, smaller pixels will result in more granular, more detailed information than larger pixels. For attribute data, breaking entities down into components results in more granular, higher resolution data – such as breaking sub-surface rights down into the specific categories of minerals (e.g. gold, silver, coal, etc.), or breaking name and address information down to the constituent components.

Accessibility – This is the characteristic of being able to gain access to information when and where it is required. The measure of accessibility is the degree of easy and convenient access that data users have to the data they require to perform their jobs efficiently and effectively. Potential accessibility applies to data that the ministry either owns and manages or can acquire from external sources. Actual accessibility applies the ease of gaining access to data from potentially accessible sources.

Timeliness – This is the availability of data required to support a function or process within an acceptable period of time to complete the process. Measuring timeliness involves assessing the proportion of functions or processes that were completed within the required time period because the data was available.

Clarity – This is the degree to which a user can understand the meaning of the data, based on its presentation, and avoid misunderstanding or misinterpretation. It includes the intuitiveness of information layout, together with labels and descriptive information to aid in communicating the correct meaning. Measurement of contextual clarity is subjective and relates to the ease with which a ministry user can understand the meaning of the presented data.

Usability – This refers to the form of presentation of information that supports a particular use and how easy that form is to use. Maps, tables and graphs are good examples of forms that can be used to present the same information, but in quite different ways. For many applications greater meaning can be conveyed to users by using graphical methods than by reading rows and numbers in a table. A graph would be more usable for these kinds of applications. Usability is entirely subjective and its measurement is the degree to which information presentation is directly and effectively usable for the intended purpose.

5.4 Financing the Change

While changing how land and resources are administered is a significant planning and execution challenge, funding that change at a time when financial resources are scarce can be daunting. Funding for such an initiative can come only from two sources, from the government or from private sector investors. Both public and private sector investors expect a positive return on investment that becomes the stage gate for this initiative. This initiative must be capable of generating a positive return on investment.

To find the answer to this question, the project team looked abroad to find other investments in cadastral reform and interest-based land and resource administration and more specifically whether costs were compared to benefits. The answer came from Australia who reported that in two separate studies done by Price Waterhouse Coopers they found 5 to 1 and 9 to 1 benefit ratios. This work apparently included the benefits to the state accruing not only from registry information but the additional investments in land and resources that resulted from better and more rapid information availability. While these studies have a much broader scope than the Integrated Registry Project, they are relevant because they cover investments in producing geographical information and

measuring the impact of those investments. The Integrated Registry Project, a geographical information system, would logically produce similar benefits. The actual ROI (return on investment) of the Integrated Registry should be confirmed as a component of a Business Case.

There are 3 potential options for funding for this initiative:

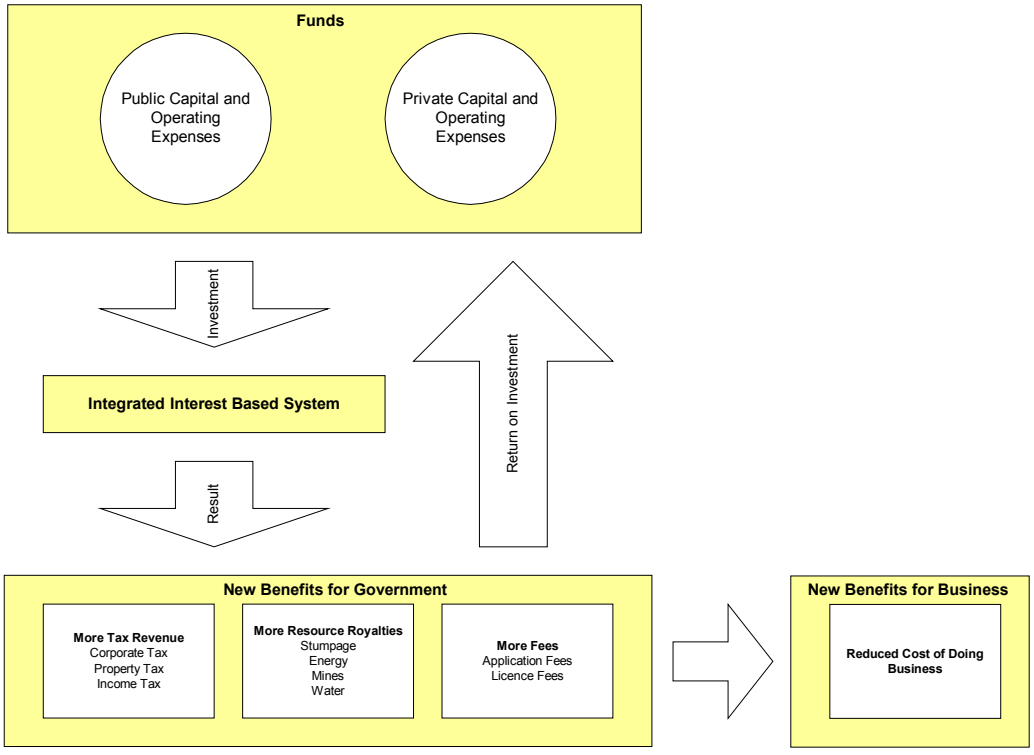
- **Provincially Funded without a Business Case** - The province can assume a positive return on investment and finance the change by voted appropriation.
- **Provincially Funded with a Business Case** - A business case comparing the financial costs with the financial benefits could be developed to prove and quantify benefits and this could subsequently provide the basis for a voted appropriation.
- **Privately Funded** (wholly or partially) - The province could provide cost and benefit information (by providing a business case) to private sector investors and obtain private sector capital in return for sharing benefits.

The first option is often used where the benefits are obvious and where there is easy access to internal capital. While analysis indicates that the benefits are positive, access to significant sums of capital may negate this, as well as, potentially, the second option.

That would leave only the third option, which is to obtain funding either wholly or partially from private sector investors. Of course, this capital would be dependent on sharing downstream benefits with those investors and the greater the certainty the greater the capital availability.

The Business Model for this investment is illustrated below.

Figure 9 - Business Model



Since it is difficult to define in advance with any degree of certainty the amount of "new" business or the amount of cost avoidance (in reduced government administrative effort) that results from a more efficient and effective registry providing a defined revenue

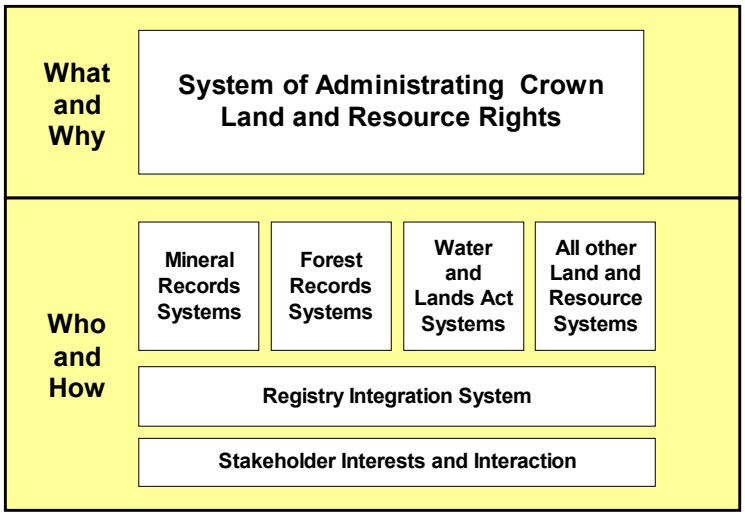
stream to private investors will present a unique challenge. For that reason it may be desirable to select a proxy such as a percentage of the application fee for all applications for rights contained in the registry, or for government to pay a fee to the private investor for each transaction the integrated registry performs.

Regardless of the option selected, providing a defined return on investment is key to securing any private sector funding, be it capital or operating. For that reason, developing a business case that clearly defines and quantifies each component in the Business Model is a key next step.

6. STRATEGY SUMMARY

In reviewing the management of land and resource rights in British Columbia and selected jurisdictions as well as analyzing best practices in land administration we have concluded that the province of British Columbia should reform its transaction-based system of administration of rights. Originally, it was thought that in order to serve the needs of stakeholders it would be possible to simply integrate the information in operational land administration systems used by various ministries and agencies. Upon closer evaluation and extensive consultations it became evident that, because of the system of administration of land and resource rights in use in British Columbia that it is not possible to achieve efficient and effective administration of land and resource rights simply by integrating current practices (Figure 10- Scope of the Business Strategy).

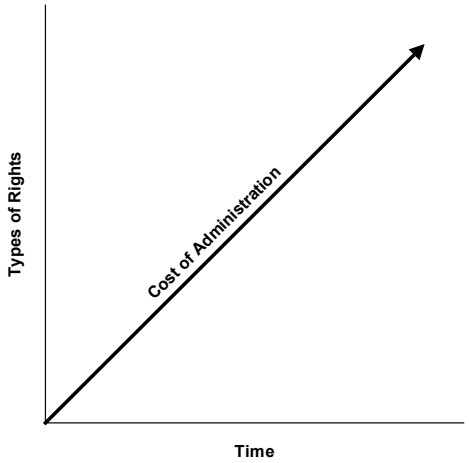
Figure 10- Scope of the Business Strategy



In order to meet the needs of government, stakeholders, and clients, the business strategy and transition plan examine not only who holds and uses land and resource information and how they use it, but also what information is needed for land and resource administration and why a register is necessary.

The province of British Columbia and most western provinces administer private land rights according to the Torrens system. This system is recognized worldwide for its simplicity, certainty, efficiency and responsiveness. With the exception of the province of Alberta most provinces do not use this system where Crown land is concerned. Instead, they convey rights through chains of administrative processes or transactions. The number of transaction types and likewise the cost of administration are driven by two factors: the types of rights conveyed, and the number of transactions. Given the nature of these two trends one might expect the cost of administration to increase over time as depicted in the figure 11 below.

Figure 11 - Conceptual Trends of Transaction Based Administration



One might liken this situation to that of a small business that starts off by keeping track of its expenses by recording the cheques that it writes and while this serves its needs while the company is small, as the business becomes larger and more complex, recording financial transactions soon does not serve the needs of the business and actually starts to hamper growth. At that point the business must convert to an accounting system that, in addition to recording transactions (in the general ledger), also shows the financial status of the company (financial statement).

Similarly, in land administration in British Columbia, growth and complexity have now made it impossible to administer land and resource rights efficiently and effectively by recording transactions.

Conversion will be difficult and costly since all the transaction chains must be read and the results recorded in an interest-based register that itself must be built, tested and implemented.

The capital cost of improving land and resource administration may be high due to the need to generate land and resource data from incomplete transactional data. Securing private sector partners to share in the cost of conversion and the financial benefits of the solution is complex, owing to the fact that the majority of the benefits accrue indirectly through improved investment in resource development. At least two studies in Australia have suggested that investment in interest-based land administration has resulted in a 5 to 9 fold payback, although, aside from a general similarity to this project, the actual return on investment to British Columbia still remains to be determined through the development of a Business Case.

Investing in world class land administrative systems is critically important to British Columbia, a province that relies heavily on its land and resources to generate the majority of its income. This is especially true in a world economy where the investment decision time is becoming shorter. If British Columbia is going to compete for investment funds it must be able to provide instantaneous information about its land and resource opportunities. Alberta has realized this and, although it already had an interest-based

Crown land and resource administration system, it has made that system available through a multi-channel service that includes Internet, in-person, and toll-free call center, as well as the more traditional methods of service.

The government of British Columbia has recognized the importance of land and resource investment and the critical linkage to better land and resource information. This recognition has led to the formation of the Ministry of Sustainable Resource Management and that ministry's Service Plan Goal #2 which contains a key project to build and operate an Integrated Land and Resource Registry on behalf of government.

The key benefits of building this integrated registry will be:

- Faster decisions and access to Crown land and resources;
- Reduce statusing cost;
- Better certainty of information;
- Reduce data collection & maintenance cost;
- Better support for improved decision-making;
- Better support for improved land-use planning and policy making;
- Improved client service; and
- Leadership in electronic service delivery and land administration.

PART B – TRANSITION PLAN

7. PURPOSE

This Transition Plan elaborates and adds details to the Integrated Registry Project – Business Strategy and defines an approach, key work areas, business relationships, budget and schedule. While the effort to develop and implement a working register of land and resource encumbrances is significant, the economic benefits of such a register are significant, especially for British Columbia where land and resource investments drive the provincial economy.

Implementing an integrated register is not solely a business or system project, but rather features a focus on ***data management***. As a result of over 100 years of current business practices, the data or information regarding land and resource rights has been lost, misrepresented, fractionalized, and contaminated with errors and omissions. Implementing a functioning register that delivers business benefit has an important systems component to record and provide access to data. The design and development of that system is estimated at $2.5 million, while finding the registry information and determining the current status of all land and resource rights so that it may be loaded in the system is estimated at $7.5 million.

The proposed implementation approach is geographically incremental. Splitting implementation among five increments ensures that full business benefits are realized for the first geographical area within 12 months of project initiation. Since some geographical areas, such as the area in the north eastern part of the province experiencing rapid oil and gas development, contribute more to the provincial economy than others, our approach ensures that the bulk of the benefits can be realized early in the project.

This plan examines, in detail, identifying tasks and subtasks (over 200 individual project steps) that must be completed in order to develop a system to store and provide access to registry information. This plan like the whole initiative must be managed in a deliberate and aggressive way in order to meet the expenditure, production and business benefit targets. For that reason we describe the role and function of a Value Management Office. This office will provide guidance for all parts of the project as well as communication and accountability essential for maintaining stakeholder and government support.

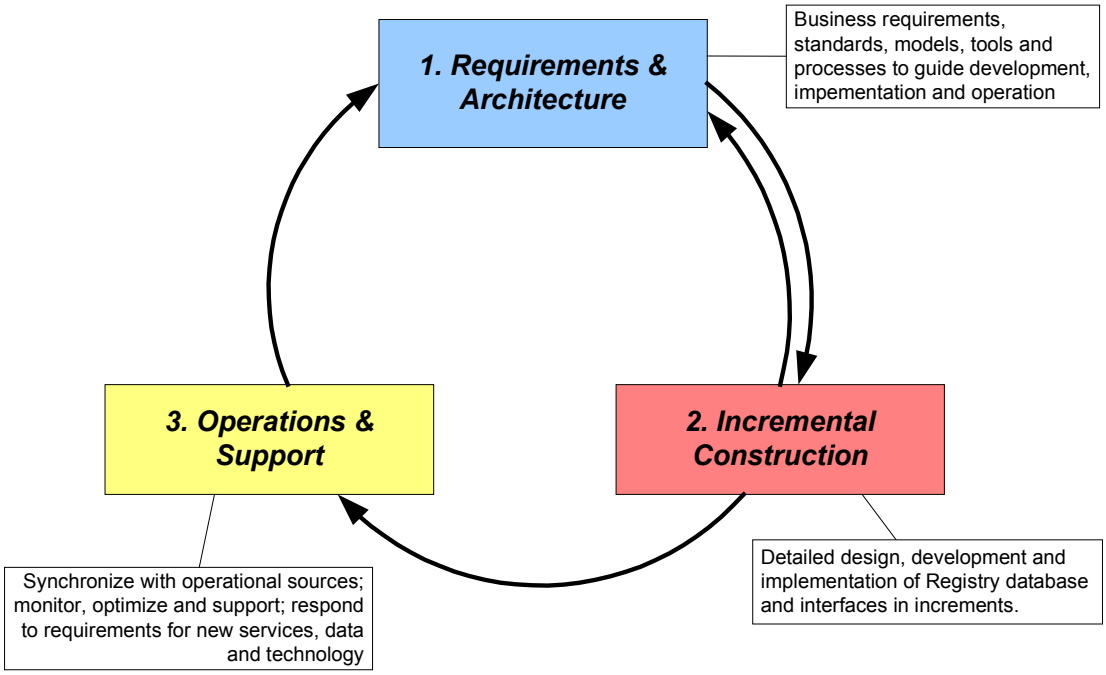
A cost benefit analysis has not been done in British Columbia; however, work done in other jurisdictions would suggest that incremental investments in land and geographic information returns at least four times that value in benefits in those jurisdictions. If the same is true for British Columbia, then producing a reliable register of land and resource information and the system to access and use it, would return over $1 billion to the province of British Columbia over 5 years.

8. APPROACH

8.1 Overview of Incremental Delivery Approach

The following diagram provides an overview of the approach to implementation of the Integrated Land and Resource Register. It is a best-practice approach based on delivery of Registry data and functions or services in increments (geographical increments in this case). Increments are subsets of the data to be accessed, or services to be provided by the Register, in response to priority business needs. This approach is commonly and successfully used in the development of data warehouses. It is a pragmatic approach to building a system such as this in a segmented, evolutionary fashion.

Figure 12 - Delivery Process



The implementation process follows a cycle of requirements and architecture, construction of an increment, followed by operational support of the increment. Outcomes from both the implementation and support of that increment may result in refinement of the architecture and become inputs to the requirements and architecture stage of the next increment. The cycle repeats increment-by-increment ad infinitum, or until all required increments have been delivered.

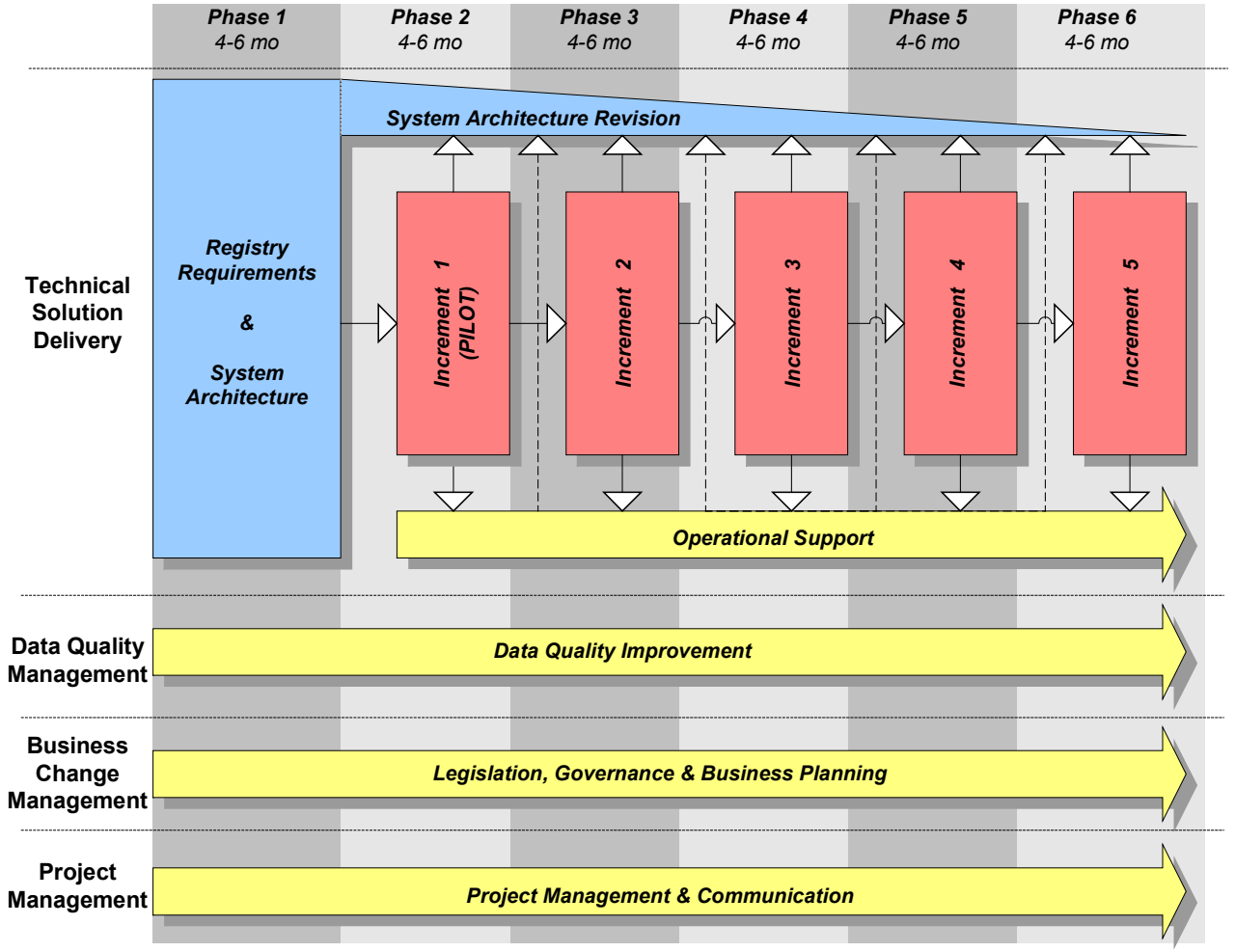
The requirements and architecture step is used to document and model the data and business needs of users of the Register at a high level. The architecture component provides a description of the underlying standards, information models (i.e. data, function process), technology tools, interfaces and processes to guide the construction, implementation and operational support of the increments.

Construction of an increment follows a more traditional systems development lifecycle approach – analysis, design and construction, followed by deployment of the increment. However, the duration of this lifecycle process is condensed so that delivery of the information and services from the increment occurs in the shortest possible time. In typical data warehousing projects, the duration for construction and delivery of an increment is between 3 and 6 months. Definition and containment of increment scope and management of user expectations is therefore critical for successful delivery of an increment. For this project, the delivery scope of an increment may focus on a subset of data – either geographically or by business area for this project – certain functions or services to be provided, or a combination of both to meet the needs of a particular priority business need or client group.

Operations and support is concerned with the ongoing management, support and administration of the system, such as ensuring the Register is properly synchronized with the transaction-based operational sources, that the system is well optimized and securely supported, and that mechanisms are in place for tracking and responding to change (data, function, technology).

The following diagram is a representation of the incremental delivery approach described above, but projected over time for a number of increments. It also shows additional ongoing streams of activities that will be critical for the successful delivery and user acceptance of the Integrated Land and Resource Register.

Figure 13 - Incremental Delivery Approach



In the above diagram, the technical solution is all the hardware and software, both commercially acquired or custom developed, as well the underlying databases, applications, services, support structures, standards and procedures that will make up the Registry. Delivery proceeds in increments with each increment adding new data or functionality from the previous increment until the entire scope of the system is delivered. A more detailed description of the components of the technical solution is provided in Section 9 Technical Solution Delivery. Delivery of the technical solution by itself will not guarantee a successful project. Other critical streams of activities include proactive data quality management, business change management and project management and communication. More detailed descriptions of these work-streams are provided in Sections 4 through 6.

The key features of the incremental approach to delivery of the Integrated Land and Resource Register include:

- The overall architecture of the ILRR is developed initially at the start based on high-level understanding of the entire scope of data and business needs to be anticipated.
- The first increment of the ILRR is developed based on that architecture. The delivery scope of the first (and subsequent increments) is based on a high business value subset of data and services (i.e. a quick win).
- Building, operating and supporting the first increment may result in changes to overall architecture of the ILRR.
- Each additional increment will extend the capability of the ILRR with more data and/or services in response to business priorities and needs.
- Each additional increment may result in further changes to the architecture, however, it is expected that the extent of these changes will diminish as the number of increments increases and the architecture stabilizes.

The incremental delivery approach is by nature evolutionary. The first increment of the Register delivers a subset of data and/or services that meets a limited but important set of business needs. As each increment is added the Register becomes more complete with the capability to meet a broader range of needs.

The approach also provides an opportunity to learn and minimize the impact of mistakes. It is unlikely that the Register architecture can be definitively known before construction of the first increment. Both increment construction and the activities of operating and supporting the Register on an ongoing basis will provide valuable feedback that will aid in refinement of the architecture.

9. TECHNICAL SOLUTION DELIVERY

The purpose of this work-stream is to design, build, implement and support the Integrated Land and Resource Register. The focus of the work-stream is mainly technical, requiring the design, development and integration of many commercial or custom developed software components. As described above, delivery of the technical solution will occur on an incremental basis. The three major activities associated with this work-stream are:

- Business Requirements and System Architecture;
- Incremental Construction; and
- Operational support.

9.1 Business Requirements and System Architecture

The purpose of the Business Requirements and System Architecture is to establish the overall architectural framework for the entire system across all phases or increments that will be required to support all anticipated business and user requirements. The architectural areas to be addressed include data, application (i.e. function or services) and technology. Given the breadth of scope (particularly the data and user scope), it will not be possible to document all of the requirements and all architectural components to a detailed level; however, sufficient detail must be captured to:

- Understand and communicate the key technical components, interactions and interfaces of the entire ILRR system;
- Determine more accurate estimates of effort, cost and time to build and support each increment, and as a result, the entire system; and
- Gain an understanding of the technical issues to be addressed during development and delivery.

Key deliverables of the Business Requirements and System Architecture include:

- Statement of high-level business requirements and information needs. Identifies entire information scope, service scope and anticipated user scope to be addressed by the ILRR.
- Statement of system goals, objectives and principles.
- Business process architecture comprising definition and documentation of all business processes that result in the creation, update or access of all registerable interests in land or resources to be maintained by the ILRR. These business process descriptions will be used as a basis for modification, refinement or improvement to reduce or eliminate data quality problems, or as a result of system changes required to reflect the role of the ILRR in resource allocation or disposition transactions.

- Data architecture comprising of high-level, logical model of all registry data components, attributes and interrelationships for all spatial and non-spatial information (e.g. textual and image data). Being high-level, the model does not reflect any implementation or technology specific details or constraints. Physical data models will be developed in the detailed design of an increment.
- Application architecture providing high-level descriptions of all major functions and services for creating, updating, and accessing ILLR data.
- Technology architecture comprising all hardware and software components, integration with operational source systems (e.g. Tantalis), integration with the IDW, integration with standard access tools and portal technology, security, etc.
- Requirements and plan for managing registry metadata including metadata integration with operational sources, the IDW and data modeling tools. This must be closely aligned with the current work the Ministry is undertaking in defining and implementing a metadata strategy for the IDW.
- Requirements and plan for business transition and operational support.
- Increment development plan comprising a description of each ILRR increment in terms of scope of data content, user groups and services provided, planned results (i.e. expected benefits) and estimates of time, effort and cost to develop.

9.2 Incremental Delivery

The purpose of incremental delivery is to design, develop and deliver a subset of the ILRR. Incremental delivery has three important characteristics:

- Firstly, it involves breaking down the entire scope of the ILRR into more manageable projects of relatively short duration and limited scope, resulting in fewer resources and management overhead;
- Secondly, it results in delivery of real business value to users sooner. The addition of new information and registry services to end-users on a periodic basis (i.e. increment by increment) helps to sustain sponsorship and on-going business commitment for implementation of future increments, particularly in latter increments where more complex data quality problems will require more resources and cost to address than in earlier increments; and
- Finally, it enables changes in business needs and priorities and technology to be anticipated and accommodated more quickly. Adjustments can be made to the system architecture as experience is gained, and as business needs and technology change.

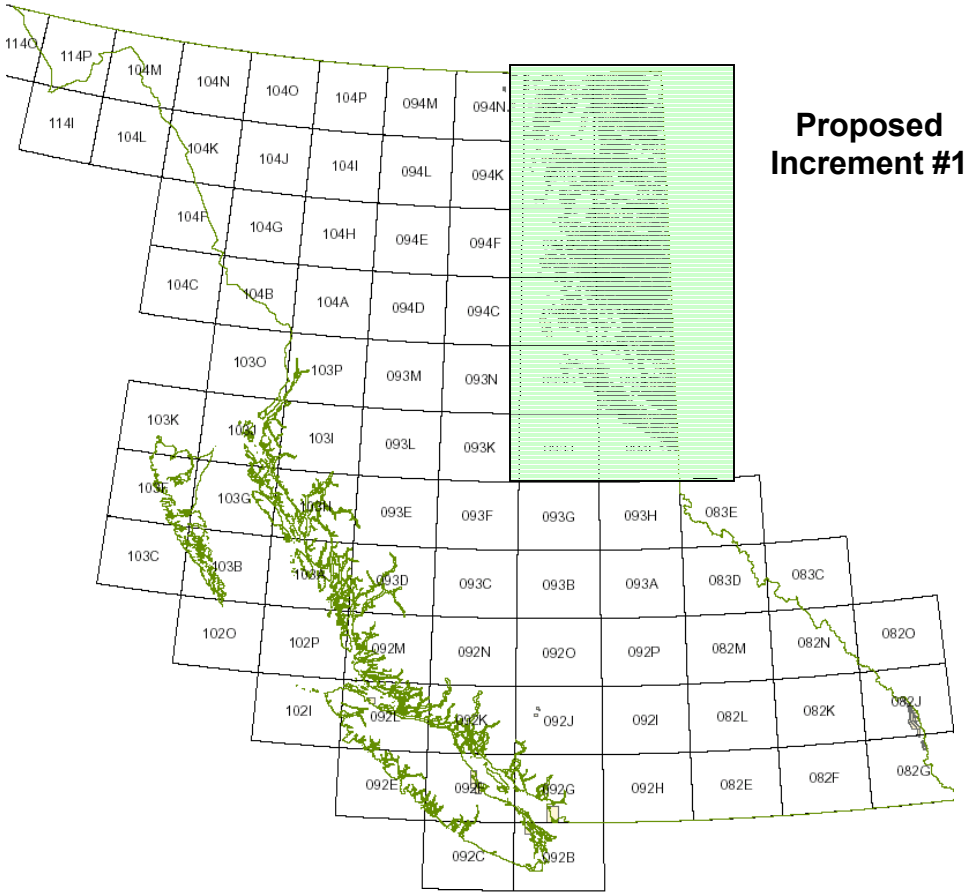
9.2.1 Increment Scope and Delivery Sequence

The scope of an increment could be a subset of data (either by geographic region or by business area), a subset of services being delivered to a subset of end-users, or combinations of each. Decisions concerning the scope and sequence for delivery of increments will need to be made based on criteria, including the:

- Economic development potential of providing access to certain kinds of registry data and services to specific user groups;
- Complexity and scope of data – some areas of the province have much higher density of information, in other areas data issues are much more difficult and complex to resolve (e.g. Southern Vancouver Island or East Kootenays); and
- Willingness of key stakeholder groups to be actively involved.

The decision on the scope of the first increment will be particularly important because it will set the overall tone for delivery of subsequent increments. Based on initial discussions with key stakeholder groups and consideration of the above criteria, Fujitsu believes that the most business value from the ILRR can be obtained by introducing increments based on a geographic subset of data (i.e. data from across all business areas within a particular geographic region) to a subset of end-users. Fujitsu also recommends that the oil and gas sector in the northeast of the province be adopted as the scope of the first increment. The following map shows the distribution of oil and gas tenures for the province and the proposed Increment #1. Almost all of the province's exploration, development and extraction of oil and gas resources take place in this localized region. With respect to the above criteria there is significant economic development potential by providing services to oil and gas companies and allowing them expedient across to land and sub-surface rights. Furthermore, existing data is generally not high density or complex compared to other areas of the province, and the key stakeholder groups (e.g. Corporation of land surveyors, MEM, OGC, and the oil and gas companies) seem to be willing participants. Identification of the scope and delivery sequence of subsequent increments are still to be determined and should be based on the outcomes of the business case and discussions with stakeholders.

Figure 14 - Potential Scope of Increment 1



9.2.2 Increment Delivery Life cycle

Delivery of an increment follows a standard system development lifecycle (SDLC) process from analysis, through design, construction and deployment. A deployed increment is used operationally by end-users and is fully supported and maintained (see Operational Support description below).

The following table identifies the key deliverables to be produced during each step in the increment delivery process:

Table 8 – Key Deliverables

Analysis	• Detailed project plan (MPP) for development and delivery of a single increment. This plan refines and extends the increment development planning done during the preceding requirements and architecture stage. • Detailed requirements for data, services, interfaces to operational source application systems (such as Tantalis) or target systems (such as the IDW), and operational requirements. These requirements take the business and user requirements defined in the requirements and stage and drill them down to more detailed system level requirements. • Refined system architecture (data, function or technology) as a result of more detailed understanding of the system requirements for the increment, defined above, or arising from experience gained in implementing and supporting prior increments. • Testing plan to verify performance of the increment relative to the requirements.
Design	• Detailed logical data model and physical database schemas for managing registry data and metadata to support the scope of the increment. • Detailed specification of all ILRR services (functions and processes) and interfaces required for the increment. • Deployment plan to manage the transition of the increment from development into production. Plan must address establishment or refinement of production system environment (depending on the increment), loading production data, user training and business transition, and final testing of the increment. • Operational support plan to support the increment on an ongoing basis. Plan must address procedures for management of security and access processes, backup, recovery and archive, database monitoring and tuning, upgrading software tools, problem management and change control. • Testing procedures and test cases.

Construction	• Installed, configured or upgraded hardware and software tools including servers, networks, storage devices, databases, middleware, Web tools, etc. • Implemented physical database schema. • Completed and tested application modules (for Registry services) and interfaces to external systems (operational sources or targets). • Installed and configured tools for deploying increment and supporting ongoing operations. • Thoroughly tested tools, services and interfaces to external systems.
Deployment	• Production-ready increment, which is subset of ILRR. Includes loaded and verified databases, functioning interfaces with external systems, access tools installed, configured and ready for operational use. • Modified business processes (where appropriate) and trained end-users in both new business processes and procedures and operation of ILRR system. • Operational support structure, resources, processes and tools established. • Formal acceptance by end-users.

9.3 Operational Support

The purpose of the Operational Support is to ensure that the deployed increment is performing and functioning correctly for end users and is properly supported. The key objective of operational support is to ensure that the right registry information is accessible and delivered to end-users in a manner that is timely enough to support their business responsibilities. To meet the objective, operational support must address the following:

- Availability – end-users will require access to ILRR services on-demand, but balanced against downtime for regularly scheduled maintenance.
- Security – given the nature of the information in the ILRR, access to data and services will need to be controlled and monitored.
- Performance – ILRR data and services must be accessible to end-users in a responsive and timely manner. The system will need to meet the expectations of end-users for performance.
- Usability – end-users will require easy and intuitive access to the data and services provided by the ILRR. Although many aspects of usability will be addressed during analysis and design (e.g. data naming, metadata, browsing and navigation), assistance must be available when required and feedback mechanisms must be in place.

Key deliverables of operational support include:

- Feedback loops with client;
- Procedures for managing and tracking problems, changes and enhancements;
- Procedures for managing access and security of ILRR data and services;
- Growth management procedures and reports to track growth of data and users to control needs for data storage, network capacity and support resources;
- Procedures and reports for managing and monitoring system performance;
- Procedures and reports for backup, recovery and archive of ILRR data; and
- Modifications to the ILRR architecture based on knowledge gained from deploying and supporting production increments.

10. DATA QUALITY MANAGEMENT

The purpose of this work-stream is to institute processes and procedures to manage the quality of information stored in the ILRR. Data quality has been identified as being the most significant issue to be addressed by the Integrated Registry project. It follows then that pro-active management of data quality is a very important part in establishing the level of user confidence, certainty and reliability required for its ultimate success.

The overall goal of data quality management is to improve the quality of data stored in the Integrated Land and Resource Register over time. This includes being able to perform assessments of data quality (such as accuracy, completeness and consistency), to cleanup data known to be of poor quality, and to address business processes that result in proliferation of poor quality data.

10.1 Data Quality Management Process

The following diagram, introduced in the Business Strategy document, provides a high-level view of the data quality management process and key functions that should be established. This process is based on the approach described by Larry English in his book *Improving Data Warehouse and Business Information Quality: Methods for Reducing Costs and Increasing Profits*.

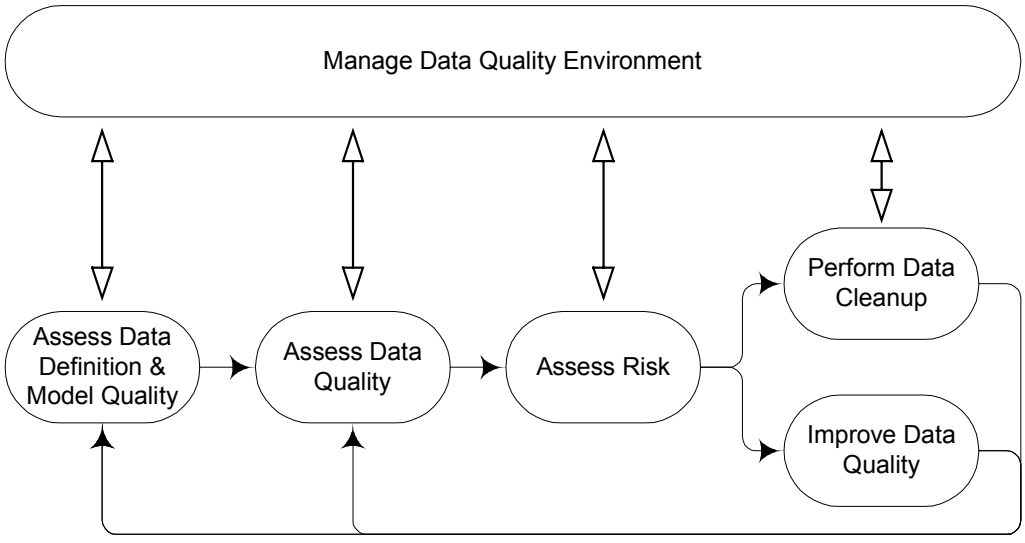


Figure 15 - High-level Data Quality Management Process

10.1.1 Process Steps

1. Assess Data Definition and Model Quality – This function assesses the quality of data standards, specifications, data definitions and data models used in the Integrated Register. Inconsistent data standards, definitions and models result in data records and values that are inconsistent, difficult or impossible to integrate and share, and difficult to correctly interpret.

2. Assess Data Quality – This function measures or assesses the level of quality of data stored in the ILRR or a source operational database relative to certain data quality characteristics and based on defined quality objectives, measures or standards. Various techniques are applied to samples or extracts of datasets to analyze, measure and report the degree of conformance for a particular data quality characteristic. This information serves as input to assessing the level of legal or financial risk.

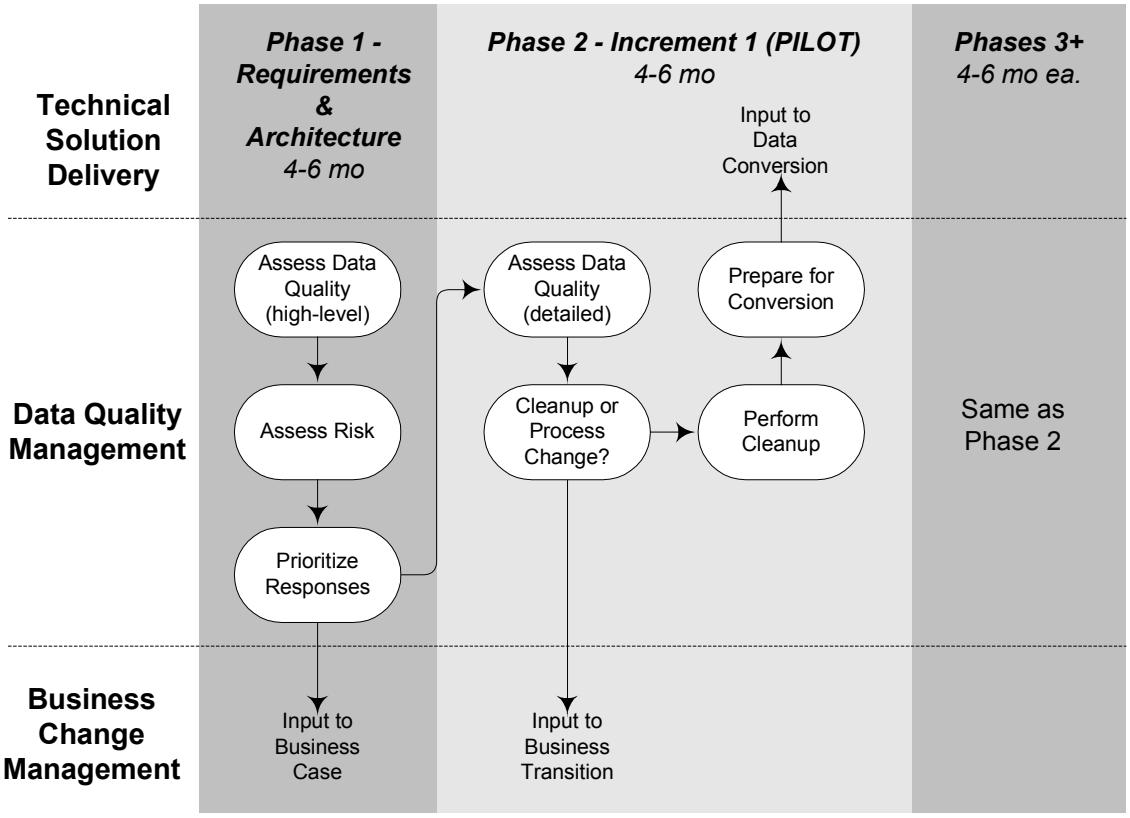
3. Assess Risk – This function identifies and measures the risk to the province of poor quality registry information. Given the purpose of the integrated register and the value of land and resource rights conveyed to interest holders, the province faces significant financial and legal consequences if information is missing, incorrect or inconsistent. Using the results of the data quality assessment, this function aids in determining priorities for subsequent data cleanup activities or long-term business process improvement for datasets where mitigating legal and financial risk is critical.

4. Perform Data Cleanup – This function corrects defective registry data so that it conforms to accepted data quality objectives and measures. Completed cleanup activities may then result in further data quality assessments or data definition and data model assessments. Because data cleanup activities add cost to the ministry (as a result of rework) the long-term strategy should be to completely eliminate any need for data cleanup by focusing on improvements to the business processes that create and maintain registry data. Data may be cleaned in source systems – the preferred approach – in specially prepared 'clean' extracts ready for loading into the ILRR, or in the target ILRR itself. Data cleaning may occur in manual or automated forms. Some automated cleaning may also be performed as data is moved from operational source systems to the ILRR.

5. Improve Data Quality – This function is focused on preventing data defects from occurring by improving the business processes and procedures that collect and maintain registry data. It takes the results of data assessment and cleanup activities to analyze root causes of data quality problems within the business process. Once root causes and associated business impacts are analyzed, process improvements are identified, planned and implemented. The cycle feeds back to the assessment functions to verify the degree to which the business process changes have improved data quality.

6. Manage Data Quality Environment – This function is focused on establishing and managing the organizational environment to coordinate assessment, cleanup and process improvement activities. It involves defining objectives, plans and priorities, securing staff, tools and techniques to perform data quality activities, defining roles and responsibilities, providing training, identifying data custodians and raising the awareness of data quality issues throughout the ministry and its clients and stakeholders.

Figure 16 - Data Quality Management Activities by Development Phase



10.2 Relationship to Technical Solution Delivery

Data quality management activities must be coordinated with the Technical Solution Delivery work-stream and there are two primary areas where these work-streams are related. Firstly, assessing data definition and data model quality is a prerequisite to, and part of, development of the underlying data architecture for the ILRR. Providing at least an initial high-level assessment of data quality for all anticipated register data, assessing the legal, financial or service quality risks of poor quality data, and providing estimates to address data quality issues is key to establishing priorities about appropriate responses to be taken. Such responses may include cleaning up critical data, modifying business processes to reduce or eliminate bad data, or tolerating poor quality data. These assessment activities should be performed concurrently with the requirements and architecture stage of the technical solution delivery, and before committing resources to data cleanup activities.

Secondly, when the data scope of the first (or any) increment is defined, and priorities for data cleanup have been established, resources can be assigned to cleaning and preparing data for that increment. This may require a more detailed assessment of data quality problems unique to the scope of the increment to refine the approaches and procedures for resolving the problems, cleaning up the data and preparing for data conversion into the ILRR when the physical design, construction and testing of the increment is complete.

10.3 Relationship to Business Change Management

Analysis of data quality issues performed during data quality assessment activities may reveal areas where poor quality data is a result of business processes that are broken or not functioning correctly. For example, any business process that requires a person to re-key data into the system increases the potential for inaccurate, incomplete or inconsistent information to occur. The most effective and enduring aspect of the data quality management process is to eliminate the potential for such problems to occur by improving or re-designing the business process. The solution to the problem in the above example may be to explore ways in the business process to exchange data electronically, thereby eliminating the need for re-entry of the information. For surveyed spatial data, this is one of the most compelling reasons to implement digital submission of survey plans. The need for entry of survey data from a paper survey plan using coordinate geometry or other techniques is eliminated, thereby eliminating errors introduced by the incorrect data capture.

The data quality assessment process will identify business processes that are the cause of data quality problems. An aspect of the business change management work-stream will be to address and manage the impact of changes to those business processes that interact with the ILRR in some way. Any business process changes designed to address data quality problems should fall within the scope of the business change management work-stream for implementation. Many of these business processes responsible for producing data are the responsibility of other government ministries (other than the Ministry of Sustainable Resource Management) and external agencies (e.g. Integrated Cadastral Information Society) and therefore obtaining cooperation is a critical delivery factor.

A further important dependency between the data quality and business change management work streams concerns development of the business case. Addressing data quality issues will be the greatest single cost item in the project. These costs, timeframes and risks associated with resolving or not resolving them must be factored in the overall business case.

10.4 Data Quality Management Deliverables

Key deliverables produced by the data quality management work-stream include:

- Data Quality Assessment Plan – outlines the scope of data to be assessed, minimum quality standards against which data are measured, assessment methods used to measure quality, resources, schedule and cost.
- Data Quality Assessment Reports – provides detailed information about the results of quality assessments by theme, subject area or system (such as Tantalis, water rights, timber rights, sub-surface rights, etc.), identification of the root causes of data quality problems and the business impacts extending from those causes, and recommendations for addressing problems either by data cleanup or by business process change.
- Risk Assessment Report – takes the results of the quality assessment reports and estimates the cost and risk associated with addressing or not addressing specific data quality problems. Includes establishment of priorities for data cleanup or business process improvement to address critical data quality problems (e.g. completeness, accuracy, consistency). The risk assessment report is a pre-requisite for the business case.
- Data Cleanup Reports – provides information on the current status or final results of data cleanup efforts.
- Clean Data Sets – these are the result of data cleanup efforts. Data may be cleaned in source operational systems, in specially prepared extracts for loading into the ILRR, or it may be cleaned directly in the ILRR.

- Data Quality Management Plan – umbrella plan for managing and coordinating all activities and resources involved in data quality management and the ongoing improvement of data quality over time. The plan should address definition of overall data quality vision relative to the ILRR, definition of organizational roles, responsibilities and structure for all data quality activities, identification of criteria for determining what data for data should be assessed, and equipping resources with the tools, training and procedures to perform data quality assessment or cleanup work.

11. BUSINESS CHANGE MANAGEMENT

The purpose of this activity is to manage any organizational business process changes, heighten awareness of impending changes and to minimize business disruption as a result of introducing the ILRR into the regulatory business processes for allocating, recording and conveying rights in land and resources. Internal to the ILRR project, there are two main sources that will drive the need for business process change. These are:

- Adjustments required to accommodate the introduction of the ILLR into the various regulator-managed business processes for accepting applications, confirming legal status, making disposition decisions, recording legal interests, issuing legal documents or confirming registration, and maintaining interests and tenures. This may also include changes in responsibilities in relation to where information is collected and where it may be accessed in an effort to reduce the amount of information that is collected or to reduce redundancy and duplication. In addition to changes in business practices and procedures, modifications to business processes will likely require changes in legislation, regulations and policies to be brought into full effect.
- Adjustments to business processes required to reduce or eliminate data errors or other data quality problems. These may be minor or major changes depending on the criticality of the quality problems to be addressed. Process changes may involve legislation, regulation or policy modification, as described above, or changes in custodial responsibilities.

Process changes driven externally form the foundation for this project, perhaps through business rationalization (e.g. integration of land and water disposition processes) or workforce adjustment activities, could be considered for inclusion within the scope of this activity, but resource requirements and implementation priorities would need to be addressed accordingly.

Business process changes will use as a baseline and starting point for modification the business process descriptions developed during the requirements and architecture stage described above.

11.1 Legislation and policy changes

As described in the Business Strategy, changing from transaction-based conveyance to register-or interest-based conveyance requires the addition of the registration step in all conveyance processes. The goal of legislative changes is to define the point of conveyance as the point at which it is registered. Current legislation defines the point of conveyance as the point at which the conveyance document is signed or executed.

Changing from a document-based conveyance to register-based conveyance can be accomplished legislatively in at least two ways by:

- Amending each statute that conveys land and resource rights by adding a reference to the process of conveyance by registration, or
- Proclaiming a new act that would describe the role of registration in the conveyance of Crown land and resources and repealing any conflicting legislation.

In order to determine the most expedient method of legislative changes it will be necessary to conduct a legislative review (see Business Strategy for a more complete description of affected legislation)

The legislative review should include the following:

- Identification of all acts and regulations that convey land and resource rights;
- Analysis of all sections that describe conveyance or assignment of rights;
- Development of a strategy that will redefine conveyance and assignment;
- Policy review to determine which major policies must be revised to coincide with revised acts and regulations;
- Drafting new sections or as noted above a new statute that will define conveyance and assignment; and
- Drafting a transition plan including required communications and change management activities.

Most legislation in British Columbia does not describe conveyance of rights in detail. As a result, extensive redrafting may not be required; however, professional legal advice should determine the appropriate course of action.

11.2 Business Case

Making a transition from a transaction-based land registry to an interest-based registry has significant costs and benefits associated with it, as discussed in the Business Strategy. In order to maximize the benefits it is necessary to have a good understanding of what those benefits are and, likewise, to understand how the implementation of an interest-based registry will generate benefits. For this reason, a *business case* is key to the development and deployment of the registry.

11.2.1 Business Case for Investors

The primary purpose of any business case is to communicate the potential returns for investors. The investors in this situation are the government ministries and agencies and the private sector organizations.

Ministry executives have expressed the desire to seek private sector "partners" or investors that would provide capital and share in the revenue stream, since construction and maintenance of an integrated registry requires a significant capital outlay. The business case, to meet the need of the private sector, should contain the following:

- **Overview:** Mission-vision and business opportunity statements, legal and legislative implications, history, locations & facilities and previous financial summary.
- **Relationship:** Relationship to government ministries, agencies and other public sector organizations.
- **Transition and Change:** Change management plan including training, staffing and communications activities.
- **Financial Summary:** Capitalization plan, operating highlights table and short and long-term graphs projecting Sales, Gross Margin, Net Income and Cash Flow.
- **Products & Services:** Description and examples of key products and services. This section should describe fulfillment and new product development, as well as the role of government verses the private sector in the development and pricing of new products and services.
- **Market:** Analysis of key market factors, including market segmentation scheme, target markets, buying patterns and market growth and trend projections.
- **Industry:** Analysis of industry characteristics and competitive factors, comparative analysis of key competitors, and summary of competitive edge.
- **Strategy:** Key strategies for achieving the mission during the plan period and quantification of short and long-term goals for measuring actual success.
- **Implementation:** Key elements of the marketing and operating plans, plus deadlines and budgets.

- **Management:** Overview of management team and advisory support with detailed descriptions of roles and responsibilities.
- **Risk Assessment:** General economic outlook, key success factors, critical risk factors and anticipated government responses to various contingent events.
- **Capitalization Plan:** Start-up condition, capitalization plan, start-up requirements and resources, use of proceeds and notice of possible later-round financing.
- **Business Projections:** 3-or 5-year projected operating highlights, key financial indicators, along with break-even, benchmark and sensitivity analyses.
- **Sales:** Forecasted Sales and Cost of Sales table for at least 3-5 fiscal years. Forecasted Sales graphs for first 24 months by quarter.
- **Net Income:** Projected Net Income Statement for the first 3-5 fiscal years.
- **References:** Information on sources of information and additional detail that will serve as a facilitation to investor due diligence.

Solely based on an Integrated Registry of crown land and resources and from information gathered in interviews, preliminary indications are that it is unlikely that there is significant financial opportunity for private sector investment; however, it is possible that a comprehensive business case may show otherwise.

11.3 Data Custodianship

The purpose of this activity is to establish, communicate and implement clear roles and responsibilities relative to the creation, management and dissemination of registry related data. The Integrated Registry Business Strategy document presented some initial guidelines that could be used as a starting point for discussion, based on information obtained from Australia.

Custodial responsibilities for the management of all land-related information is in the process of being reviewed by government generally, and by MSRM specifically. The ministry's IMB is currently leading an initiative to establish custodianship guidelines. This project must align with the work being performed in that project.

The key components of this activity include:

- Ensuring that registry or cadastral specific guidelines or responsibilities are properly reflected in the ministry-wide guidelines being developed by IMB;
- Communicating the meaning, importance and impact of the custodianship guidelines;
- Identifying custodians for each of the major datasets; and
- Ensuring that custodians understand and generally adhere to the rights and responsibilities defined in the guidelines.

11.4 Partnerships

Based on experiences in other jurisdictions, the development, deployment and operation of an integrated registry of Crown land and resources should be the responsibility of the Crown. This experience suggests that shifting the responsibility for recording ownership of Crown land and resources to non-government organizations may meet with public resistance. Based on discussions with Australia, the public view is that government best represents the public interest as the custodian of the official land and resource records. While public opinion on this subject has not been tested in British Columbia, it might be prudent to retain the responsibility for registering interests within government while seeking partnerships for the *delivery* of registry functions.

Based on information from other jurisdictions and stakeholder discussions, Table 9 below summarizes registry functions and potential for shared delivery.

Table 9 - Registry Responsibilities

Registry Function	Government	Delivery Agent
Cadastral Updates	x	x
Certification of interests	x	
Data Conversion	x	
Data Maintenance (assignments, name changes, etc.)	x	
Manual Searches	x	
Production of maps and other products		x
Registering new interests	x	
Registry IT system development and operation		x
Status Searches		x

This table demonstrates the significant role of government in providing indisputable information regarding the lands and resources for which it is the steward but also provides some willingness of the private sector to partner with government in the delivery of registry services and products.

Cadastral Updates – While building and maintaining the cadastre for the province of British Columbia is the responsibility of government, other groups such as the Survey Profession, industry groups and societies have expressed a desire to participate in this process. This level of interest suggests that government may potentially provide a regulatory structure and funding while other groups who generate the information would maintain the cadastre.

It has been suggested by professional organizations, that the Surveyor General should set the cadastral standards, as well as oversee its construction and maintenance. The Surveyor General in this role would provide assurance of technical integrity consistent with public interests

Certification of Interests – Certifying the accuracy and authenticity of registered rights and interests should be retained by the government.

Data Conversion – Converting and cleaning data is a daunting task comprising over 90% of the cost of implementing the integrated registry. It is unlikely that an attractive business case for private sector funding could be developed.

Data Maintenance – By itself the maintenance of data cannot generate revenue except through charging user fees.

Manual Searches – Searching for information that is not in the register requires significant government business knowledge and access to government systems and records.

Production of Maps and Other Products – Provision of official records especially in map format may in some circumstances be revenue generating. Trend information however, indicates a growing opinion that this information, if provided electronically, should be free of charge.

Registering New Interests – Registering interests is part of granting or transferring interests from the Crown. Since it is the Crown that is granting those interests, it follows that the Crown must register them.

Registry IT System Development and Operation – The register must be electronic and, since it currently does not exist, must be developed. Potentially there are two different partnering or outsourcing arrangements:

- Capital Development – Capital development is funded by the private sector and the funds are recovered through operating charges. These operating charges may be in the form of periodic (monthly, quarterly or annual) charges or user fees charged for transactions.
- Application Maintenance Contract – Government would contract the private sector to build the application and then sign a long-term contract for the operation and maintenance of the system.

Partnership Implementation Considerations

Since the business model for registries has yet to be developed it would be highly speculative to describe how government and the private sector could structure a partnership arrangement. Our recommendation is to develop the business case as described in Section 11.2 – Business Case and invite potential business partners through an RFI (Request for Information) process.

12. TRANSITION FOR REGULATORS

Regulators or ministries and agencies that administer land and resource rights will be impacted by the activities and projects to deploy the integrated land and resource register. At the very least, this impact will be to provide information to the development project and to support the required legislative and policy changes necessary to recognize the register, and at most it will be to provide expertise to help interpret their transactional data required to populate the registry interest database.

Of course, after construction it will be necessary for regulators to make the procedural changes necessary to take advantage of the registry.

Stakeholders and clients of regulators will be the primary beneficiaries of the register and will be affected by the register. Even though the changes are beneficial, it may be necessary for regulators to provide information and assistance in using the register in tasks such as obtaining status information or searching for investment opportunities.

The following sections address transition from the perspective of management, data conversion and cleansing, legislation and policy, and registry use.

12.1 Program Management

Management of the construction and deployment of an integrated register requires a number of interrelated initiatives or projects to be defined and managed. While it is suggested that this activity be managed and coordinated by a Value Management Office, it is necessary for Regulators to provide management guidance for this program and its components through a Steering Committee.

It is suggested that all regulators be represented on the Steering Committee and, where necessary, on working committees for the duration of the program.

12.2 Data Conversion and Cleansing

The register will contain and use *interest* information, which may or may not exist in regulator information systems. In the majority of cases it is anticipated that the information held by regulators is transactional, and would require staff with expertise in the business of that regulator to interpret (read and extract the interest) those transactions. It is also known that some regulators have interest-based information that could be readily converted and would require very little, if any, work by the regulator.

Regulators in all cases will be asked to provide access to records and, in some cases, to provide assistance in interpreting those records. The extent of the work that is required is the subject of the Data Assessment project that has been recommended as an important first step before construction of the registry begins.

Through interviews it was learned that, in some cases (geographically concentrated on Vancouver Island and the Kootenay regions), neither transactional information nor interest information about rights and encumbrances exists within government. Where that is the case, it may be necessary for the regulator to re-establish ownership of that right by passing legislation re-establishing the interest of the Crown or calling for potential owners and interest holders to come forward with proof of ownership.

Establishing a continuous and reliable cadastre of rights and interests will mean addressing those existing "holes" in ownership just once (during the course of this project) and will provide a lasting benefit to the regulators, as well as current and potential interest holders.

12.3 Legislation and Policy

Examination of legislative and policy alternatives required to implement the register is the subject of future work; however, whatever the outcome of that work, it will be necessary for regulators to support the changes to legislation necessary to establish the legal framework.

Once the register is established through legislation it will be necessary for each regulator to review their applicable policies to reflect the existence and use of the register.

12.4 Registry Use and Application Management

Regulators may need little encouragement, in principle, to use an integrated register, especially in performing statusing, adjudicating applications and confirming the existence of a right or encumbrance (e.g. for assessing levies and rentals, resolving disputes); however, incorporating the functionality in their current IT systems will require some deliberate effort.

In the case of ministries and agencies that are currently redesigning their administrative systems such as the Ministry of Forests FTAS project, the Ministry of Energy and Mines Map Staking Project, and the IT redesign work underway by Land and Water BC, incorporating a link to the central registry will save development effort and reduce costs.

Where redevelopment is not scheduled, such as in the case of the Land Titles system, it will be necessary for a software link to be developed to ensure that both systems can interact transparently. Regulators with those systems will be asked to work with the registry staff to define and manage the metadata and other information necessary to establish and maintain the links.

13. PROGRAM MANAGEMENT AND COMMUNICATION

Previous sections describe the initiatives and tasks that must take place in order to build and deploy an Integrated Land and Resource Registry. This section describes the options for managing that deployment to provide assurance that, at minimum, the registry is built on budget and on schedule and that the benefits described in the proposed Business Case are measured and delivered.

Governments and businesses have been implementing program offices to ensure projects are delivered according to a predetermined budget and schedule. More recently, however, they are concerned with not only delivering the project, but also in delivering the benefits that the project was intended to produce. This focus on delivering benefits requires the discipline of a Value Management Office. This section describes both in the context of delivering an Integrated Registry.

13.1 Integrated Value Management Office

The delivery of an interest-based register is intended to produce some primary benefits to government such as reduced statusing costs, lower application adjudication costs, and reduced IT system costs; however, the majority of the benefits are secondary, being generated as a result of having a more accurate and more responsive land and resource administration system.

These secondary benefits will be determined in detail in the Business Case and are the justification for constructing and deploying the registry. Given this, it is logical that a mechanism be put in place to track the fulfillment of those benefits from the first development increment to completion.

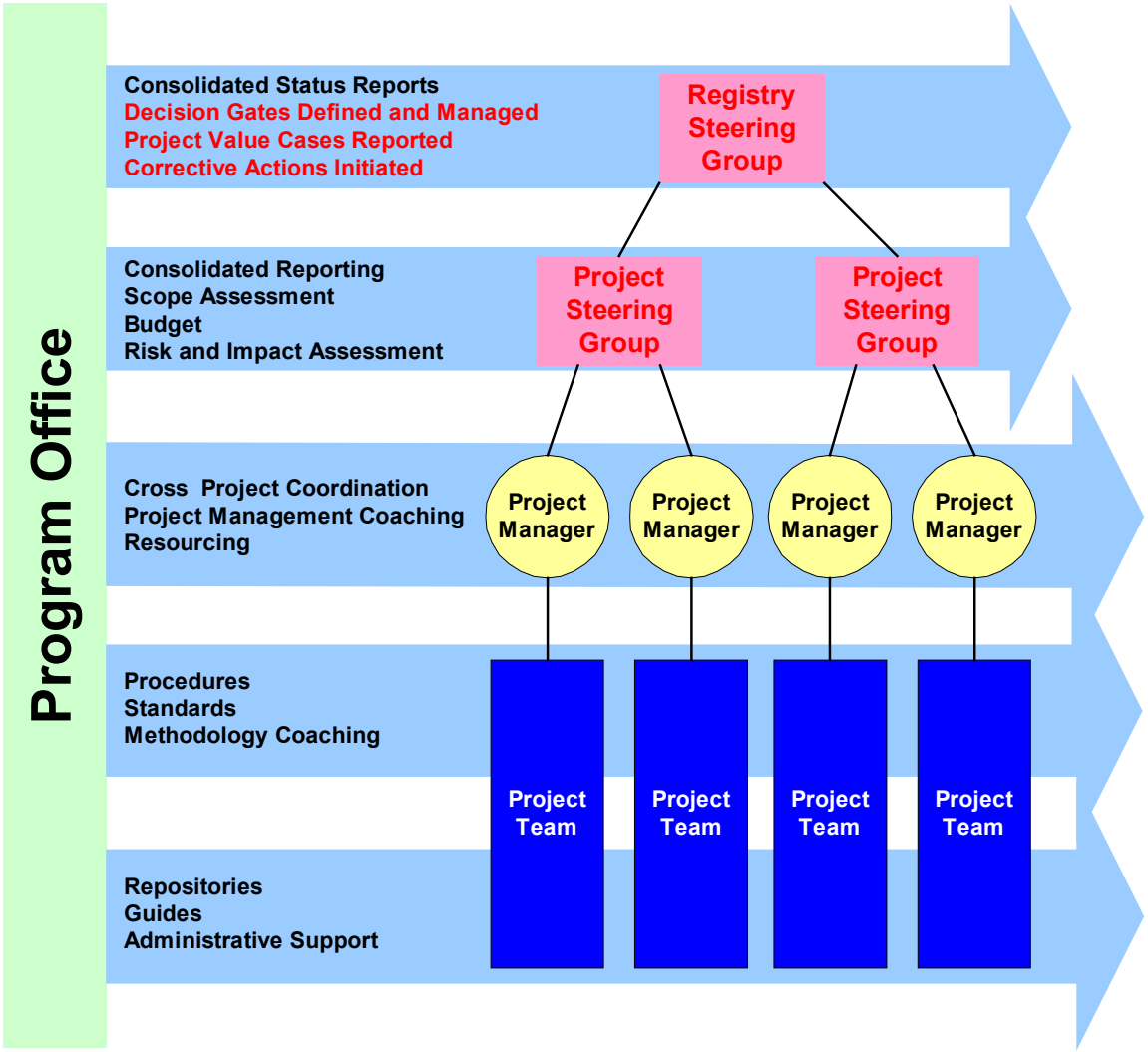
The best way to ensure that benefits are being realized is to measure and monitor them systematically. The best mechanism for doing this is a specialized program office called the Value Management Office. To deploy a Value Management Office the ministry would augment the normal Project Office with value analysts whose focus is on:

- Business results;
- Alignment;
- Financial worth; and
- Risk.

The Value Management Office monitoring activities include progress on benefits realized by government and business, and providing management oversight to ensure that each project adds value before it is initiated and while it is executed.

In short, the value management focus supports management in bringing a sharper focus on how to get the best value from the mix and timing of projects, as illustrated in the following figure.

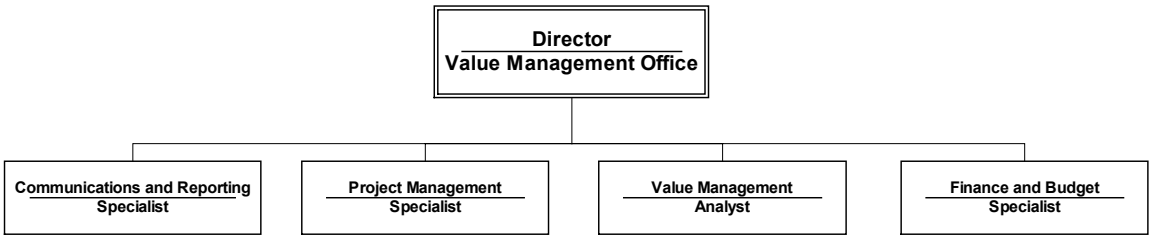
Figure 17 - Value Management Office



13.1.1 Program Office Organization

It is highly recommended that, upon approval of the Business Case for the registry integration project, a program Value Management Office be established and staffed. The following figure illustrates a suggested organization structure with the skills required to operate a successful Value Management Office that could provide the necessary management support required to deliver Registry Integration.

Figure 18 - Value Management Staffing Model



A successful Value Management Office deployment requires four distinct staff skill sets or roles.

1. **Communications and Reporting** - Providing regular formal reports to management, stakeholders, project managers and others.

2. **Project Management** - Coaching, guides, project plans, and procedural materials provides consistency required in order to report progress, manage risks and dependencies.

3. **Value Management Analysis** – Monitoring and calculating value states for the program and each project. This information is used to plan expenditures and resource deployment.

4. **Finance and Budget** – Planning and documenting expenditures and budgets.

13.2 Value Management and Partnerships

Obtaining partner support for building and deploying an Integrated Register is a goal of government. This partnership relationship would require a sharing of benefits as well as costs, both of which would be described in the Business Case and, while that Business Case would show the *potential* costs and benefits, it may be difficult or impossible for partnerships to develop until *actual* benefits are realized.

If this is the case, that partnerships will not develop substantively until benefits are realized, then it is also the case that benefits must be documented or proven. The Value Management Office provides this ongoing proof of benefits by tracking and documenting the benefits to government and potential partners.

In fact, without a mechanism for quantifying benefits it would not be possible to define the terms of a partnership.

It is suggested, therefore, that the value tracking and documentation as well as the management of value be used early in the program to attract partners by providing those partners with the necessary information required for their financial participation. For example, if the first increment is deployed in the northeastern portion of British Columbia so that it encourages investment in the oil and gas sector, then the Value Management Office should be asked to document benefits to the producers, surveyors, professional organizations, First Nations, timber companies, guides and outfitters, fur trappers, tourism, and governments.

The documentation of benefits, as well as communication with these interests through the Value Management Office, will produce the necessary information and relationships necessary to develop partnerships to share costs and benefits of:

- Producing an accurate cadastre;
- Maintaining cadastre and related attributes;
- Accelerating the deployment of the register by bring to bear more information and resources; and
- Producing a healthy interactive relationship with affected stakeholders.

13.3 Summary and Recommendation

Registry integration is a large multi-year program (with many projects) both in terms of benefits and expenditures as defined by the business case. In order to ensure that these expenditures are minimized and the benefits are maximized, it is essential that the program be actively managed.

Likewise, new accountability guidelines require that ministries report progress in terms of performance and benefits relative to expenditures. In the current context, all of the functionality (as illustrated Figure 16) is, therefore, mandatory.

Likewise, it is the desire of government to engage partners to help fund the development and operation of an integrated land and resource registry. Although the development of a Business Case that discusses potential benefits will be a good starting point in the development of partnership relationships, it is unlikely that partnerships will be possible until actual benefits begin to flow from the deployment of the first increment(s). To ensure that these benefits are identified, tracked and documented, it is necessary to deploy value management principles through the establishment of a Value Management Office.

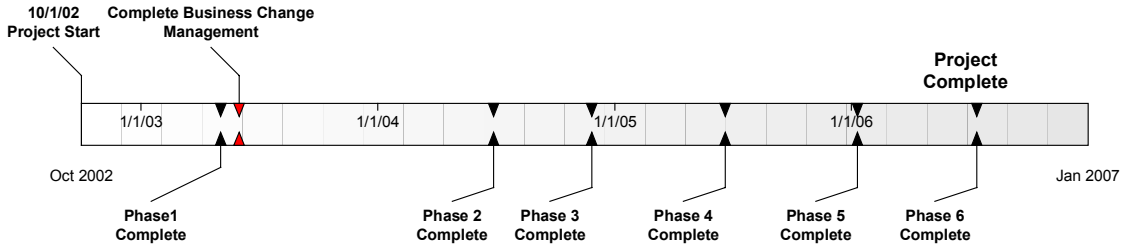
Communicating relevant information to stakeholders will produce a healthy environment where those stakeholders are willing to provide help and assistance to the initiative. These relationships are the foundation of successful partnerships.

14. TIMELINE AND ESTIMATES

Since the only work done on this initiative to date is a Business Strategy, it is not possible to determine the cost of implementation to any degree of certainty.

The cost of obtaining data comprises the bulk of the cost of implementation, yet very little is known about the effort required to obtain it. To that end, we recommend that a data assessment be done as the first step in implementation and that the information from that assessment be used to revise the timeline and estimates.

14.1 Project Timeline[14]



14.2 Overall Estimates

Key Deliverable	Projected Cost ('000's)
Business Change Management	$290
Phase 1	$417
Phase 2	$2,022
Phase 3 through 6	$7,616
Other Costs	$45
Total	**$10,390**

[14] The project start date is representational and has not been determined as of the date of report printing.

14.3 Planning Assumptions

For the purposes of determining a schedule and estimates of cost, the following assumptions were made:

- Project activities are contiguous without approval lags or other administratively imposed delays including necessary policy or legislative changes.
- System development will be done using SDLC (System Development Life Cycle) principles.
- Data conversion will be done by a team of approximately 20 ministry and/or knowledgeable contract staff.
- There are no staff or resource availability constraints.
- There are no dependencies on other projects or initiatives that will cause a delay or lag.
- A program office is implemented to manage the critical path and dependencies (projects, approvals, communications, resourcing, budgets and milestones).
- Staff rates are assumed to be:

Ministry Staff (loaded cost)	$75 /hour
Contract Staff	$110 /hour
Specialist Resources	$150 /hour
Data Conversion Team	$1,500 /hour

- Project estimates do not include hardware, software, maintenance, or data purchase, database maintenance (back-up, restore, version update, etc.), personnel training, in-house development of macros and interfaces, in-house support for users, operating expenses (paper, disks, etc.), and office space.

15. External Dependencies and Risks

Successful completion of this project and the realization of an integrated registry is dependent on many external factors, not all of which can be forecasted with any degree of certainty. This section is intended to document the dependencies known to the project team as a result of discussions with stakeholders and ministry staff.

There are two types of dependencies: business dependencies and technical dependencies. Business dependencies are initiatives and projects that must be initiated or altered in order to support the integrated registry.

Business Dependencies

- ICIS (Integrated Cadastral Society) must provide the cadastral base according to the specifications and schedule required by Integrated Registries;
- Partnerships are dependent on a successful and positive business;
- An organizational structure must be put in place to manage and deliver the integrated registry project;
- Staff must be recruited and trained to extract interest information from ministry transaction records and then to subsequently load it in the register; and
- Government must be willing to make legislative changes.

Technical Dependencies

Shared services including the Enterprise Portal, Integration Broker and other tools that are current government standards. It is anticipated that these services will be available for Integrated Registry use.

Selection of suitable software and hardware. Application software required for registry information is currently licensed to government. Partnerships, emerging government standards, and detailed business requirements may cause the selection of alternate software.

Integrators and skilled professionals. The integration of spatial and registry information requires the development of a well-designed data model. This and subsequent deliverables are dependent upon procuring highly skilled technical expertise within a fixed timeframe.

Risks

The business and technical risks identified in the previous section must be addressed by a comprehensive risk management strategy. That strategy should include:

- Communications capability to prepare written and presentation materials for specific stakeholder groups, ministry staff and legislators. Concise information about what a registry is and how it will function is necessary in the preparation of the business case, legislative and policy review and in maintaining internal and external support.
- Visible leadership with the authority to make decisions to execute the project tasks especially recognizing that these tasks, particularly cleaning and converting data will be conducted across many ministries.
- Procurement processes that can ensure that suitable resources can be found and engaged.
- Planning and monitoring must be in place to manage scope and ensure progress according to plans and budgets.
- Value management should be implemented to demonstrate and document value from each increment. For example, the first increment should document significant value in cost avoidance in government and accelerated Oil and Gas development. In order to demonstrate value, a value management program must be implemented.

The list of first order dependencies and risks identified in this section is not exhaustive and, as such, it is recommended that the program develop a risk management strategy to identify and mitigate risks. While some risks are known, many more will arise.

PART C - APPENDICES

16. APPENDIX A – GLOSSARY OF TERMS

The following definitions have been taken and adapted from a Land Administration Thesaurus developed and maintained by the International Federation of Land Surveyors (FIG).

Term	Description
Cadastre	The International Federation of Surveyors (FIG) defines the cadastre as follows: "A cadastre is normally a parcel based and up-to-date land information system containing a record of interests in land (i.e. rights, restrictions and responsibilities). It usually includes a geometric description of land parcels linked to other records describing the nature of the interests, and ownership or control of those interests, and often the value of the parcel and its improvements. It may be established for fiscal purposes (e.g. valuation and equitable taxation), legal purposes (conveyancing), to assist in the management of land and land use (e.g. for planning and other administrative purposes), and enables sustainable development and environmental protection."
Deeds Registration	In an official deeds registration system, a copy of the relevant deed, for example a transfer deed, is deposited in the deed registry. An appropriate entry is then made into the register of the time, date, parties and transaction, as may be required by the particular jurisdiction. The documents generally require to be checked by a notary or an authorized lawyer to assure the validity of the transaction and entry. This transaction reference, together with the supporting deeds, then provides evidence of the vendor's right to sell the property. The deeds registration system is limited in that it doesn't provide a guarantee of title. It does not provide the clarity, certainty or guarantee required for an ideal system. All that it typically provides is access into the chain of transactions that can be used to prove title. Deeds registration systems can be "enhanced" by a title insurance system. This is a common arrangement in some US states where title insurance companies have developed as private deeds registers and will insure purchasers against losses as a result of defective title.

Term	Description
Land Register	The land register is the definitive or official record of all registered properties, and comprises the registered details for each property. In some jurisdictions there are three registers or parts to the register: the Property Register, the Proprietorship Register and the Charges Register. These contain respectively: • Clear identification of the parcel and of the right owned, both in the parcel itself and in any other property, including a plan of the parcel; and • The names of the owners and their addresses, together with any caution or restriction on the owner's right to dispose of the property, and any interests adversely affecting the property, including leases, charges, mortgages, restrictive covenants and easements over the property.
Land Registry	The land registry is the institution or office responsible for land registration. The title of the office and the responsibilities vary considerably between jurisdictions, as, accordingly, does the staffing and equipment of the office.
Land Registration	The International Federation of Surveyors (FIG) defines land registration as follows: "Land registration is the official recording of legally recognized interests in land and is usually part of a cadastral system. From a legal perspective a distinction can be made between deeds registration, where the documents filed in the registry are the evidence of title, and registration of title, in which the register itself serves as the primary evidence. Title registration is usually considered a more advanced registration system, which requires more investment for introduction, but provides in principle greater security of tenure and more reliable information. Title registration usually results in lower transaction costs than deed registration systems thereby promoting a more efficient land market."
Ownership Register	The ownership register is a part of the general land register, and is also known as the Proprietorship Register. It contains the names of the owners and their addresses, together with any caution or restriction on the owner's right to dispose of the property.

Term	Description
Register	A register is a facility for recording specified matters. It may be a paper-based record, kept in loose-leaf files or bound into books. It is more likely in sophisticated economies in the 21st century to be digitally recorded, using computer technology, and increasingly to be accessible by the Internet. There may be several registers associated with land and property within one jurisdiction, including, for example, those related to land taxation and valuation, such as the traditional cadastre, and those related to ownership, such as the land register or land book. In some jurisdictions these registers are being integrated with other land information to enable many purposes to be fulfilled.
Title Registration	Under a title registration system, there are, broadly speaking, two parts of the register. The first is a map on which each parcel is demarcated and identified by a unique parcel identifier. The second is a text that records details about the title, the owner and any rights or restrictions associated with the parcel's ownership, such as restrictive covenants or mortgages. A simple transfer of the property simply results in a change in the name registered. A division of the land or alteration of the boundaries requires amendment to the plan and the issue of new documents or certificates. The official title registration record is definitive.
Torrens System	The Torrens System of title registration is named after Sir Robert Torrens who introduced such a system into South Australia in 1858. The key features of title registration are security, simplicity, accuracy, expedition, cheapness, suitability to its circumstances and completeness of the record. Three generally accepted fundamental principles for the success of a title registration system are: • The **mirror principle** – that the register reflects accurately and completely all of the current facts material to the title • The **curtain principle** – that the register is the sole source of information necessary for a purchaser. No further historical investigation beyond the register is necessary • The **insurance (or guarantee) principle** – the province is responsible for the veracity of the register and provides compensation to anyone who suffers a loss in the event of an error.

17. Appendix B – Acts Conveying Land and Resource Rights

17.1 Statues Conveying Rights

The following tables list statutes in British Columbia that convey rights for two ministries, the Ministry of Energy and Mines and the Ministry of Forests. They are presented here for illustrative purposes only.

Energy and Mines	
Act	**Details (if applicable)**
British Columbia Railway Finance	
Coal	
Columbia Basin Trust	
Economic Development Electricity Rate	
Energy Efficiency	
Gas Utility	
Geothermal Resources	
Hydro and Power Authority	
Hydro and Power Authority Privatization	
Hydro Power Measures	
Mineral Land Tax	
Mineral Tax	
Mineral Tenure	
Mines	
Mining Right of Way	
Ministry of Energy, Mines and Petroleum Resources	
Natural Gas Price	
Oil and Gas Commission	
Petroleum and Natural Gas	Act except ss. 74-77; and except in relation to collection of public money, other than fines, & admin. of deposits & securities payable under ss. 73, 78, 80 & 81
Petroleum and Natural Gas (Vancouver Island Railway Lands)	
Pipeline	
Power for Jobs Development	
Utilities Commission	
Vancouver Island Natural Gas Pipeline	

Forests	
Act	**Details (if applicable)**
Forest	Act except in relation to collection of public money, other than fines, & admin. of deposits & securities payable
Forest Practices Code of British Columbia	Act except ss. 3 & 4, & except in relation to collection of public money other than fines, & admin. of deposits & securities payable
Forest Renewal	
Forest Stand Management Fund	Act except in relation to collection of public money, other than fines, & admin. of deposits & securities payable
Foresters	Act except s. 9 (2)
Ministry of Forests	Act except in relation to collection of public money, other than fines, & admin. of deposits & securities payable
Range	Act except in relation to collection of public money, other than fines, & admin. of deposits & securities payable
South Moresby Implementation Account	Act except in relation to collection of public money, other than fines, & admin. of deposits & securities payable
Timber Sale License Replacement (Sliammon First Nation)	

17.2 Complete Listing of Forest Regulations

- Advertising, Deposits and Disposition Regulation (B.C. Reg. 552/78)
- Allowable Annual Cut Proportionate Reduction Regulation (B.C. Reg. 156/94)
- Annual Rent Regulation (B.C. Reg. 353/87)
- Christmas Tree Regulation (B.C. Reg. 166/2000)
- Community Forest Agreement Regulation (B.C. Reg. 384/2000) see *FOREST PRACTICES CODE OF BRITISH COLUMBIA ACT*
- Credit to Stumpage Regulation (B.C. Reg. 385/81)
- Cut Control Regulation (B.C. Reg. 360/96)
- Effective Director Regulation (B.C. Reg. 243/94)
- Forest Accounts Receivable Interest Regulation (B.C. Reg. 406/98)
- Forest Regions and Districts Regulation (B.C. Reg. 19/2000)
- Free Use Permit Regulation (B.C. Reg. 335/99)
- Innovative Forestry Practices Regulation (B.C. Reg. 197/97)
- Interest Rate Under Various Statutes Regulation (B.C. Reg. 386/92) see *ASSESSMENT AUTHORITY ACT*
- Log Salvage Regulation for the Vancouver Log Salvage District (B.C. Reg. 220/81)
- Minimum Stumpage Rate Regulation (B.C. Reg. 354/87)
- Performance Based Harvesting Regulation (B.C. Reg. 175/95)
- Scaling Regulation (B.C. Reg. 446/94)
- Small Business Forest Enterprise Regulation (B.C. Reg. 265/88)
- Special Forest Products Regulation (B.C. Reg. 355/87)
- Timber Definition Regulation (B.C. Reg. 401/87)
- Timber Harvesting Contract and Subcontract Regulation (B.C. Reg. 22/96)
- Timber Marking and Transportation Regulation (B.C. Reg. 253/97)
- Woodlot License Regulation (B.C. Reg. 190/99)
- Designated Areas under section 169 of the Act - notice

18. APPENDIX C – CADASTRE 2014 STATEMENTS

The following table outlines the key statements and indicates their relevance to BC and the Integrated Registry Project.

Table 10 - Cadastre 2014 Principles

Cadastre 2014 Statement	Relevance to British Columbia
Statement 1: Cadastre 2014 will show the complete legal situation of land, including public rights and restrictions!	This statement fundamentally describes one of the key drivers and objectives of the Integrated Registry Project. An accurate land status – whether performed by a regulator as part of a land or resource allocation decision, a proponent applying for use of land, a land use planner or a treaty negotiator – provides the complete legal situation of the land and resources regardless of whether the land is private or public (i.e. Crown). The problem is – as well described in the Cadastre 2014 document – that the procedures for recording interests over public land are different and less rigorous than for recording interests over private land. Moreover, in BC, as elsewhere, recording interests over Crown land is distributed among different agencies according to their statutory responsibilities, with each having its own system and procedures for recording. There is no common definition of the interests and no central place where all the interests can be found. Consequently it is extremely difficult and time-consuming to get a complete and accurate picture of the legal situation of the land. As Crown land is further developed, the potential for conflicting use will increase significantly. This statement implies that the same principles should be used for recording interests on Crown land (under public law) as are used on private land (under private law).

Cadastre 2014 Statement	Relevance to British Columbia
Statement 2: The separation between 'maps' and 'registers' will be abolished!	Available technology – paper and pencil – has forced this separation. The separation was also reflected organizationally. One organization unit looked after the mapping part and the definition and location of legal boundaries, while another organization unit looked after the registration part. This extended yet further into the separate roles for land surveyors on the one hand, and lawyers or notaries in the other, even though they are dealing with the same subject matter (i.e. the definition and conveying of rights to land and resources). Information technology allows for integration of maps and registers to produce a spatially enabled, electronic register allowing seamless access to both spatial and attribute information. This principle is a fundamental objective of the Integrated Registry Project.
Statement 3: The [hardcopy] Cadastral map will be dead! Long live modeling!	This statement redefines the function of maps from an information storage medium, to a means of representing or reporting information stored in an electronic database and based on a data model. Data models are inherently more flexible than maps and they can support the production of many different types of maps (e.g. scale, content or presentation). BC has been experiencing this transition for some time so this statement is not inconsistent with that direction. Some agencies have developed extensive digital models from which a range of map-style information products can be produced. Other agencies, however, still rely in manual drafting techniques to record locational information. The Integrated Registry Project will move BC further along the path implied by this statement. This will require a shift in thinking and approach for those agencies clinging to manual drafting techniques.

Cadastre 2014 Statement	Relevance to British Columbia
Statement 4: The 'paper and pencil cadastre' will have gone!	This statement recognizes the electronic world in which BC has been living for some time and the fundamental shift from manual means of land recording (e.g. maps and register books) to more efficient, automated forms. Information technology based-systems and tools will be the normal tools for conducting business. Important issues around the legality of electronic records as official records needs to be fully resolved in BC for this statement to be completely realized.
Statement 5: Cadastre 2014 will be highly privatized! Public and private sector are working closely together!	In response to worldwide trends of deregulation and privatization, this statement recognizes the role of the private sector and the collaboration between private and public sectors to establish systems that are flexible, client-oriented and secure. For BC this statement aligns closely with the objectives of the ministry service plan in terms of exploring opportunities for private and public partnerships.
Statement 6: Cadastre 2014 will be cost recovering!	Land administration systems are expensive to develop and maintain, however, land and resources documented and secured in such as system represent a multiple of that investment (i.e. the collective value of land and resources being managed). For BC, the degree of recovery of development and operational costs from those who benefit is still an open question. While there are some compelling examples of cost recovery or revenue generation in BC (e.g. Land Titles via BC Online), there are other examples where information or services are provided free of charge. There is no consensus or consistent government policy for trading land-related information or services across the various provincial agencies with responsibilities for managing land.

19. APPENDIX D – REFERENCE - ALBERTA PUBLIC LANDS ACT

Registration of Assignments
Definitions

113 In this Part,

(a) "assignment" includes transfer;

(b) "disposition" includes any lease, permit or licence, or any instrument granting an estate or interest in public land and made pursuant to the Forests Act or its predecessors;

(c) "registration" or "register" means:

(i) the entering in a book authorized by the Minister for that purpose of an assignment, and

(ii) the endorsing on or attaching to the disposition affected of a memorandum evidencing an entry under subclause (i).

RSA 1980 cP-30 s118

Registration of assignment

114

(1) An assignment of a disposition that the holder is not prohibited from assigning by any Act or regulation or by the disposition itself may be registered by the Minister.

(2) The Minister shall cause to be kept in the Department books for the registration of assignments.

(3) The Minister may refuse to register an assignment unless

(a) the assignment, other than an assignment of a mineral surface lease, is unconditional,

(b) all of the persons to whom the disposition was made are the assignors under the assignment,

(c) the assignment is executed in a manner satisfactory to the Minister and accompanied with proof of execution satisfactory to the Minister,

(d) the assignment is in a form satisfactory to the Minister, and

(e) the prescribed fee is paid.

(4) When an assignment is executed by an attorney or agent, proof of the authority of the attorney or agent, in a form satisfactory to the Minister, shall be submitted to the Department.

RSA 1980 cP-30 s119;1984 c34 s30

Effect of registration of assignment

115

(1) Notwithstanding anything in an assignment, but subject to this section, the interest of an assignor in a disposition ceases on registration of an assignment of the disposition and, on that registration, the assignee becomes the holder of the disposition.

(2) An assignment registered under this Part is valid against and takes priority over any unregistered assignment.

(3) Insofar as an assignment affects the Crown, the assignment is deemed to take effect from the time of its registration.

RSA 1980 cP-30 s120

Assignments where holder assignor and assignee

116

(1) An assignor may assign a disposition to himself or herself and another person or persons and on registration of the assignment is entitled to the interest that the assignment purports to convey to the assignor to the same extent as if the assignor were not the assignor.

(2) Two or more persons, being the holders of a disposition, may assign the disposition to one or more of them, who on registration of the assignment are entitled to the interest that the assignment purports to convey to that person or them to the same extent as if that person or they were not the assignors.

RSA 1980 cP-30 s121

Registration deemed to confer consent

117

(1) When an Act or regulation or a provision of a disposition prohibits an assignment of the disposition except with the consent of the Minister, the consent of the Minister is deemed to be given by the registration of the assignment under this Part.

(2) Nothing in this Part abrogates or restricts the right of the Minister to refuse the Minister's consent to an assignment.

RSA 1980 cP-30 s122

20. APPENDIX E – REFERENCE - ALBERTA MINES AND MINERALS ACT

Registration of transfer

91

(1) A transfer with respect to an agreement that the lessee is not prohibited from transferring or agreeing to transfer by any provision of this Act or any regulation or by the terms of the agreement, may be registered by the Minister if the regulations respecting registration of the transfer are complied with and if the transfer conveys

(a) the whole of the agreement,

(b) a specified undivided interest in the agreement, or

(c) a part of the location contained in the agreement.

(2) A transfer made by the Minister pursuant to section 23(3) or a judgment or order of a court

(a) shall be registered by the Minister, and

(b) is as effective as if it were a valid transfer registered under subsection (1).

(3) The Minister may cancel any registration made under this Division if the registration was made in error.

(4) On the registration of a transfer, the transferee becomes the lessee with respect to the agreement, the undivided interest in the agreement or the part of the location so transferred.

(5) A transfer registered under this Part is valid against and prior to any unregistered transfer.

(6) Insofar as a transfer affects the Crown, the transfer is deemed to take effect from the time of its registration.

RSA 1980 cM-15 s136;1994 c22 s21;1997 c17 s28

21. APPENDIX F – CUSTODIAN RIGHTS AND RESPONSIBILITIES

21.1.1.1 Definition of Custodian

A custodian of a dataset is a recognized agency having the responsibility to ensure that a dataset is collected and maintained according to specifications and priorities determined by consultation with the user community, and made accessible to the user community under conditions and in a format conforming to established standards and policies.

21.1.1.2 Custodianship and the Integrated Registry

Custodianship is at the core of efficient and effective spatial information management because it provides for accountability for key datasets and identifies an authoritative source that gives users a measure of consistency. Custodianship is also a means of:

- Eliminating unnecessary duplication in the collection and maintenance of spatial information;
- Managing information on behalf of others;
- Providing a strong and secure information infrastructure;
- Assisting the production and management of spatial information products; and
- Facilitating the collection of key datasets and spatial information.

Collectively, custodian agencies manage the spatial information as trustees or stewards in partnership with provincial sponsors and users to enable the integration of spatial information for the benefit of the community. Consequently, custodian activities, including negotiations with other agencies and users, as well as information product development, must take place for the benefit of the whole community of users, not just an individual agency. The overriding philosophy in all these activities should be one of stewardship and partnership for all users. This gives users confidence in the level of integrity, timeliness, precision and completeness.

21.1.1.3 Principles of Custodianship

Custodianship assigns to an agency certain rights and responsibilities for the collection of spatial information and the management of that information on behalf of users. The rights and responsibilities include the right to set marketing conditions for spatial information and responsibilities regarding the maintenance and quality of this information and the provision of metadata. Custodianship provides a means of accountability and reliability of source for designated information within government. It also ensures accessibility of

the information and provides a recognised contact point for the distribution, transfer or sharing of the information.

Principle 1 - Stewardship

Custodians do not 'own' data but are stewards of the data on behalf of the community.

Under this principle, custodian agencies become the steward, not the owner of the information held in their databases and the Integrated Registry. This results in an emphasis upon cooperation in sharing information amongst agencies rather than competition.

Principle 2 - Standard setting

Custodians, in consultation with sponsoring agencies and users are responsible for defining appropriate standards and proposing them for acceptance.

Setting standards to determine how the information will be collected, described and used is the most important commitment that an agency makes when agreeing to become a custodian. Custodians must seek input from users to assist in defining appropriate standards for information in their custody, and propose standards for broad level acceptance. These include standards for access, collection, classification, description, accuracy, quality, format and structure of the information.

Principle 3 - Maintenance of information

Custodian agencies must maintain plans for information collection, conversion and maintenance in consultation with sponsoring agencies and users.

Consequently, custodians must liaise with sponsoring agencies, cross-agency committees, clients and other affected parties when making any significant information management or dataset changes, so that the impact upon users can be assessed. The custodian agency is also responsible for negotiating the terms and conditions under which other agencies collect and maintain the spatial information on its behalf.

Principle 4 - Authoritative source

The custodian becomes the authoritative source for the dataset in its care.

In acting as the authoritative source, the custodian agency becomes the preferred supplier of this information. This lessens confusion for users and overcomes the accuracy and reliability problems that may be encountered when supposedly identical information is held separately by several agencies, where several agencies contribute information to a common database, or where information provided by different agencies is combined. By virtue of its development and maintenance plans the custodian is also likely to have more current information than other agencies. As the agency responsible for setting the standards, the custodian is also in the position of being able to advise the client on the source, currency and completeness of the information.

Principle 5 - Accountability

The custodian is accountable for the integrity of the data in its care.

A custodian may delegate any or all of its responsibilities for a fundamental dataset in its care to another agency. It will, however, still remain accountable for the integrity of the fundamental dataset. The custodian must ensure that through any delegation its full responsibilities can still be met. Where a custodian agency agrees to another agency marketing its information, or producing a value added service or information product, it should draw up a formal agreement with the other agency.

Principle 6 - Information Collection

Collection or conversion of information can only be justified in terms of a custodian's business needs.

Custodians are not expected to collect or convert information for which they have no business requirement. Collection must be justified in terms of their own needs. These will generally reflect either the agency's priorities or statutory responsibilities. If other agencies require further information to be collected, they can either:

- Wait until the custodian can justify the collection/conversion;
- Contribute the required resources to the collection/conversion of the information by the custodian;
- Contribute to a submission by the custodian for more funds for the collection/ conversion of the required information; or
- Collect/convert it themselves.

If an agency collects or undertakes work on any spatial information that is under the custodianship of another agency, it must do this according to the custodian's standards and provide the custodian agency with a copy free of charge and according to an agreed transfer standard. The custodian will then be responsible for future maintenance.

Principle 7 - Maintain Access

A custodian must maintain access to the datasets in its care at the highest level for all users.

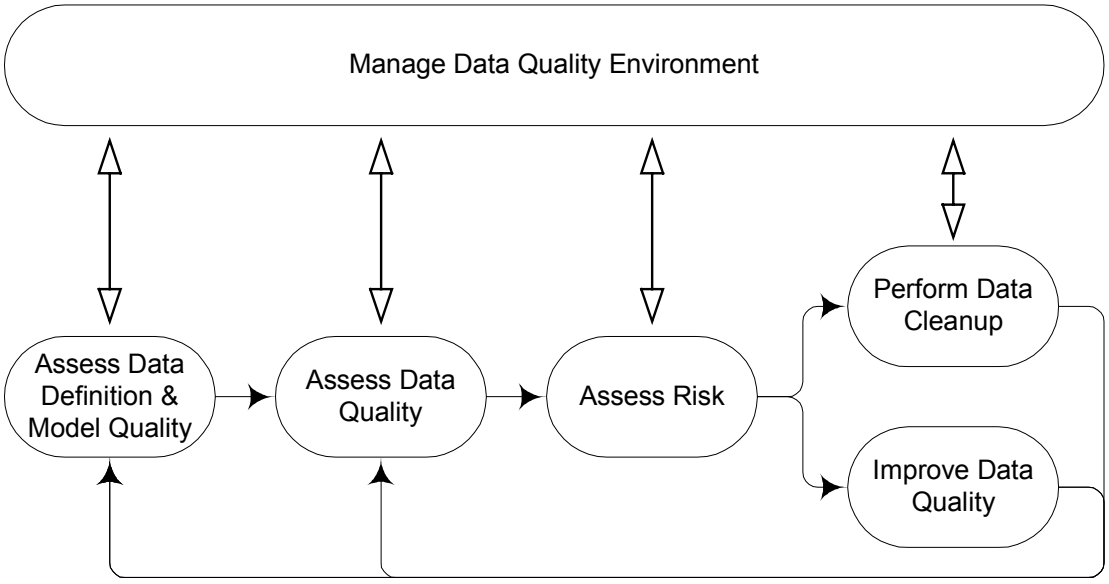
Custodians should ensure that technical, operational or other factors do not reduce access to datasets or resulting information products held in their care. Consideration of access requirements should be included in these processes, including outsourcing or other processes that may assign some component of the custodial roles to other agencies or entities.

22. APPENDIX G – DATA QUALITY MANAGEMENT PROCESS

22.1.1.1 Data Quality Management Process

The following diagram provides a high-level view of the kind of data quality management process and key functions that should be established to manage and improve the quality of registry information on an ongoing basis. This process is based on the approach described by Larry English in his book *Improving Data Warehouse and Business Information Quality: Methods for Reducing Costs and Increasing Profits*.

Figure 19 - High-level Data Quality Management Process



Assess Data Definition and Model Quality – This function is focused on assessing the quality of data standards, specifications, data definitions and data models used in the Integrated Register. Inconsistent data standards, definitions and models result in data records and values that are inconsistent, difficult or impossible to integrate and share, and difficult to correctly interpret.

Assess Data Quality – This function measures or assesses the level of quality of registry data stored in a database or file based on certain data quality characteristics. Various techniques are applied to samples or extracts of datasets to analyze, measure and report the degree of conformance for a particular data quality characteristic. This information serves as input to assessing the level of legal or financial risk.

Assess Risk – This function identifies and measures the risk to the province of poor quality registry information. Given the purpose of the integrated register and the value of land and resource rights conveyed to interest holders, the province faces significant financial and legal consequences if information is missing, incorrect or inconsistent. Using the results of the data quality assessment, this function aids in determining priorities for subsequent data cleanup activities or long-term business process improvement for datasets where mitigating legal and financial risk is critical.

Perform Data Cleanup – This function corrects defective registry data so that it conforms to accepted data quality objectives and measures. Completed cleanup activities may then result in further data quality assessments or data definition and data model assessments. Because data cleanup activities add cost to the ministry (as a result of rework) the long-term strategy should be to completely eliminate any need for data cleanup by focusing on improvements to the business processes that create and maintain registry data.

Improve Data Quality – This function is focused on preventing data defects from occurring by improving the business processes and procedures that collect and maintain registry data. It takes the results of data assessment and cleanup activities to analyze root causes of data quality problems within the business process. Once root causes are analyzed, process improvements are identified, planned and implemented. The cycle feeds back to the assessment functions to verify the degree to which the business process changes have improved data quality.

Manage Data Quality Environment – This function is focused on establishing and managing the organizational environment to coordinate assessment, cleanup and process improvement activities. It involves defining objectives, plans and priorities, securing staff, tools and techniques to perform data quality activities, defining roles and responsibilities, providing training, identifying data custodians and raising the awareness of data quality issues throughout the ministry and its client and stakeholders.

23. APPENDIX H – INTERVIEW SUMMARIES

Ministry of Sustainable Resource Management

- Sub-Surface Tenures
- Land Tenures
- Forest Tenures
- Archaeology
- Surveyor General
- Business and Information Services Division
- Integrated Cadastral Initiative
- Land Titles
- Resource Management Department

Stakeholder Groups

- BC Yukon Chamber of Mines
- BC Mining Association
- Land Reserve Commission
- Corporation of Land Surveyors of B.C.
- Canadian Association of Petroleum Producers*
- Council of Forest Industries (COFI)

Ministry of Water, Land and Air Protection

- Environmental Protection Division
- Contaminated Sites
- Fisheries

Ministry of Energy and Mines

- Resource Development Division

Land and Water British Columbia Inc.

- Land and Water Management Division

British Columbia Assessment Authority

- Corporate Services

BC Oil and Gas Commission

- Corporate Services

Ministry of Forests

- Resource Tenures and Engineering Branch
- Forest Enterprises Branch

* Organization was contacted but did not respond.

24. APPENDIX H1

Ministry of Sustainable Resource Management – Sub Surface Tenures

Clients / Relationships / Dependencies

- Key client the MEM Regulator and data owner, Titles Branch. Dependent on maintenance of systems, data quality, completeness and availability
- Other key internal clients Land Planners, LAWBC, Ministry of Forest, Aboriginal Treaty Lands negotiators. Same as 1.
- Mining industry, associations, prospectors (Free Miners), Surveyors, lawyers and the public use the data, especially the information on the Web site.

Products & Services Provided

- Maintain attribute and spatial databases MiDA and EnerGIS.
- Maintain complete, accurate and current attribute and graphical sub-surface tenure information
- Maintain and enhance mineral, placer and coal tenure information on the Web
- Status mineral lands
- Plot and produce digital and paper maps containing tenures, reserves, and alienations

Output Format

Hard Copy (maps etc.)	Data Transfer	Tenure / License	Status / Advice
☒	☒	☒	☒

Service Initiation Method

Mineral Placer Coal (former Mineral Titles)

- Attribute data entered in MiDA system or EnerGIS by Regulator.
- Recording (data entry) of event in MiDA Records will trigger an event in MiDA to prompt plotting of tenure by SST drafters. Drafter plots the tenure, determines ground acquired (statusing), and advises Regulator if a problem is found. MiDA prompts advice of need to do forfeitures, cancellations etc.
- Requests for Mineral, placer or coal reserves received by Titles Branch. Titles Branch requests that SST do statusing and map production. SST returns information to Titles Branch for creation of reserve.

Petroleum Lands
(Titles Branch, formerly the Petroleum Lands Branch, and the Oil and Gas Commission)

- Regulators enter attribute records into the Petroleum Titles System (PTS) and the Petroleum Accounting Receivable Systems (PARS). Titles Branch produces routine maps (some still manually) and SST produces special maps.
- Oil and Gas Commission (used by SST) and Crown Lands plot the well sites.

Input format

Hard Copy (form, letter)	E-Form	Fax / Phone	BC Online
☒	☒	☒	☐

Business Process Description

Administration of mineral, placer, coal, oil and computer systems

- Maintain attribute data (MiDA Records) systems for placer, coal and mineral tenures; including data corrections, systems improvements, etc. Data is recorded by Titles Branch, Ministry of Energy and Mines (MEM) and Government Agents offices (GA). The data is owned by the Regulator, Titles Branch, MEM.
- Maintain graphic data (MiDA Graphics) and systems for placer, coal and mineral tenures. Map showing location received from MEM or GA and drafters plot the information, create the digital maps, determine the land acquired and advise MEM/GA when no land is acquired or there is a problem. The data is owned by MEM.
- Statusing mineral lands to show lands, which are open or closed to mining. Including plotting no-staking and conditional reserves, and providing advice to government agencies on land status. Reserves are created by Regulation of the Minister of Energy and Mines. Applications for reserves are received by Titles Branch MEM and SST does statusing and creates required maps.
- Maintain graphic data (EnerGIS) and systems for petroleum, natural gas, geothermal, and methane tenures. The data is owned by the Regulator, Titles Branch, MEM.
- Manage, enhance and develop computer systems to reflect the business needs of the Regulator, government agencies and Registries Branch.

Approval Process

- The Regulators are responsible for the approval process for all regulatory decisions with respect to tenure and statusing of mineral lands. SST inputs graphical data to keep maps up-to-date, produces maps, does statusing, and makes recommendations.
- Determining priorities for updating maps is done in response to computer prompts for work that is required (mineral, placer and coal maps), receipt of sketches, and consultation with the regulators.

Approval Request via

Hard Copy (form, letter)	E-Form	Fax / Phone	Mail
☒	☒	☐	☐

Note:
E-Form is actually a computer-generated trigger which occurs in MiDA when attribute record is entered.

Sketches are received as hard copy through government mail.

Documentation Requirements

- MiDA and EnerGIS maintain electronic record of transactions. Maps are all Microfiched for archival purposes.
- Statute specifies that the Regulator (i.e. Chief Gold Commissioner) is the owner of the records.
- Administrative files are created for all systems projects (e.g. project files under 6450-20)
- Change request forms are used to track all changes to the MiDA system including data corrections, enhancements, etc.

Estimated Turnaround Time

Process Request	Research / Retrieval	Approval Process	Notify Client
N/A			

Processing reserves-from the time of receipt by Regulator to creation of the Minister's order takes 8-weeks of lapsed time. Actual SST time - one day (dedicated time) for routine requests, to weeks for complex requests (e.g. multiple sites with complex statusing.)

Plotting tenures dedicated time varies, by the complexity of tenure in the area and whether all the information on the map is in vector (not raster), from a few minutes to days (for cleanup of Lease of Placer Mineral area). Most are plotted within a month of receipt of sketch.

Charges / User fees

- Charges and user fees are collected by the Regulators for applications, staking, maintenance of title, etc.
- There is no charge to internal government users.
- SST charge for hard copies and digital maps. Money collected by Government Agents and credited to Titles Accounts and goes into Consolidated Revenue.
- Mineral, placer and coal titles information, maps, statistics and regulatory information have all been made available on the Internet for free for the last 5 years. This was done because MEM clients need to be able to browse titles data, mineral potential information, etc. for exploration planning purposes.
- New PDF maps showing mineral title will be placed on the MSRM web site in June 2002. The site will be considered a test site for the foreseeable future until such time as government decides whether to charge for access to the maps.

Information Needs

- TRIM base maps (including version information).
- Polygon and attribute data for protected areas (parks and ecological reserves). The data needs to align with sub-surface needs (shows claims as "save and accept", etc.).
- Complete polygons and attribute data information on location of Indian Reserves; including private lands purchased by the Federal Government for the purpose of creating an Indian Reserve.

- Land Titles information on parcels where the sub-surface rights are privately held. This is a significant issue for all the railway belt lands (e.g. the EN on Vancouver Island). Statusing of those areas is very costly.
- Crown Lands information.

It is critical to have the required data sets available in the format and scale required by the user (e.g. MicroStation for mineral, placer and coal; ArcInfo for oil and gas), and to have the ability to translate our data into the format needed by the other users.

Other Registry Information Required

- Location of Protected areas (especially Parks, including regional, and Ecological Reserves),
- Indian Reservations.
- Private lands bought by the Federal Government to create Indian Reserves.
- Crown Lands.
- TRIM base map.
- Land Titles records where the sub-surface rights are privately held.

Technology /Current Applications

- MiDA Graphics. Input in MicroStation into a MSRM server. Output in MicroStation. Output translated for other users into Map Guide, ArcInfo, and PDFs.
- MiDA Records. Input into PowerHouse RDB application running on ITSD Alpha server.
- MiDA on the web. Attribute records information and queries run on Java application (start June 2002) on Ministry server with maps available in PDF format. Map data and select attribute data is also available on MEM Map Place web site. Operation information with respect to mineral, placer and coal information found on MEM web site.
- EnerGIS is an Arc application on MSRM server (effective June 2002). Other systems containing oil and gas information were retained by MEM.
- Oil and Gas attribute, and map information not currently available on the Web.

Registry information

Updated	Researched	External Registry
☒	☒	☒

Access to Registry information

Online	Manual	Automated Via Application
☒	☒	☐

Registry information Viewing

Web-enabled	Spatial Data	Special Software Required
☒	☒	☒

Internal & External Partnerships

- Sub Surface Tenures (SST) maintain, enhance, and develop registry to support clients.
- Ministry of Energy & Mines (MEM) is the regulatory body responsible for tenure and owns the data under the respective statutes. MEM is responsible for clearly defining the business needs and providing information to SST to ensure the registry reflects the business.
- SST and MEM jointly decide on priorities for drafting workload, systems enhancements, etc.

Recommendations

Policy / Legislation, Standards / Practices & Guidelines

- Mineral Tenure Act
- Energy and Mines - Business Standards and practices
- Sub Surface Tenures - systems standards, maintenance and enhancements, mapping procedures

Strengths & Opportunities

Overall business process knowledge of team:

- Extensive experience
- Ability to interpret data
- Business Standards and practices
- Knowledge of SST systems standards, maintenance and enhancements, mapping procedures

Related Projects / Initiatives

- Data warehouse project.
- MEM map selection project.
- Crown Lands e-payment pilot may have application.

Impediments/Issues

- Limited resources affect both the ability to maintain tenure currency on maps and to complete converting the maps to the 1:20000 BCGS. This will affect the Integrated Registry and the ability to support Map selection.
- MEM Map Selection project (completion target of 2004) will significantly affect the method of acquiring, recording and disposing of title. Depending on how the business rules evolve, it could result in a need for great statusing and drafting resources. The changes are not within the control of MSRM, but could have significant resource implications.
- Issues for the Integrated registry are:
- Data alignment.
- Data completeness.
- Data integrity.
- Data access (from other agencies such as Federal government, municipalities, etc.)

Data Quality / Currency Issues

- Data currency: Mineral, placer and coal tenures are available in digital form. Polygons are all closed polygons and digital data is in good shape. However, for mineral and placer claims, the maps reflect an opinion of the actual location of the tenure. The free miner submits a sketch drawn on a Mineral reference map, which shows the location; the tenure is plotted based on that information. Tenures (with the exception of mineral and placer leases) are not surveyed. In addition, the number of drafting resources available result in a considerable backlog of plotting in the staking season (late spring to early fall).
- Data completeness: Reserves and alienations are not all available in digital form; tenures and reserves in half the province are still mapped on a raster 1:31680 base.
- Data consistency: Maps are currently in the process of being converted from 1:31680 scale to 1:200000 TRIM base. Only half the province has been completed and current resources allocation means the project will not be completed for 3 years.
- Data currency: Due to current method of acquiring mineral and placer title, the prospector stakes the claim in the field and has 20 days to record the title. This means that maps are always a minimum of 3 weeks out-of-date. A change to map selection would make the maps more current. Coal applications are plotted on maps as applications and are therefore more current.
- Data currency and completeness: Acquisition of title is affected by other prospectors who may have recorded title in the area, previously held title at or near the location, the creation of protected areas, etc. Therefore, the amount of ground actually acquired cannot be immediately determined at the time of acquisition.
- Data alignment and accuracy**:** Since maps reflect an opinion of the location of claims relative to the TRIM base map, Crown lands, Indian reserves, protected areas, etc., any change to the data by any of those agencies will affect the accuracy of the mineral tenure. In one example, a Crown grant was moved several miles onto a different map sheet and the mineral claims had all been drawn based on the location of that Crown grant. There is no mechanism for knowing whether the other maps have been changed.

Integrated Registry

Urgently Required	Some Benefit To Process	No Impact On Internal Process
☒	☐	☐

Documentation of Work Flow and Technology Environment

Provided	To Follow	Not Available
☒	☐	☐

Information Source

In person interview with the following individuals on May 22, 2002:

- Rosa Munzer
- Paul Hagen
- Jack Leedham
- Stan Hoffmann
- Adam Dewey

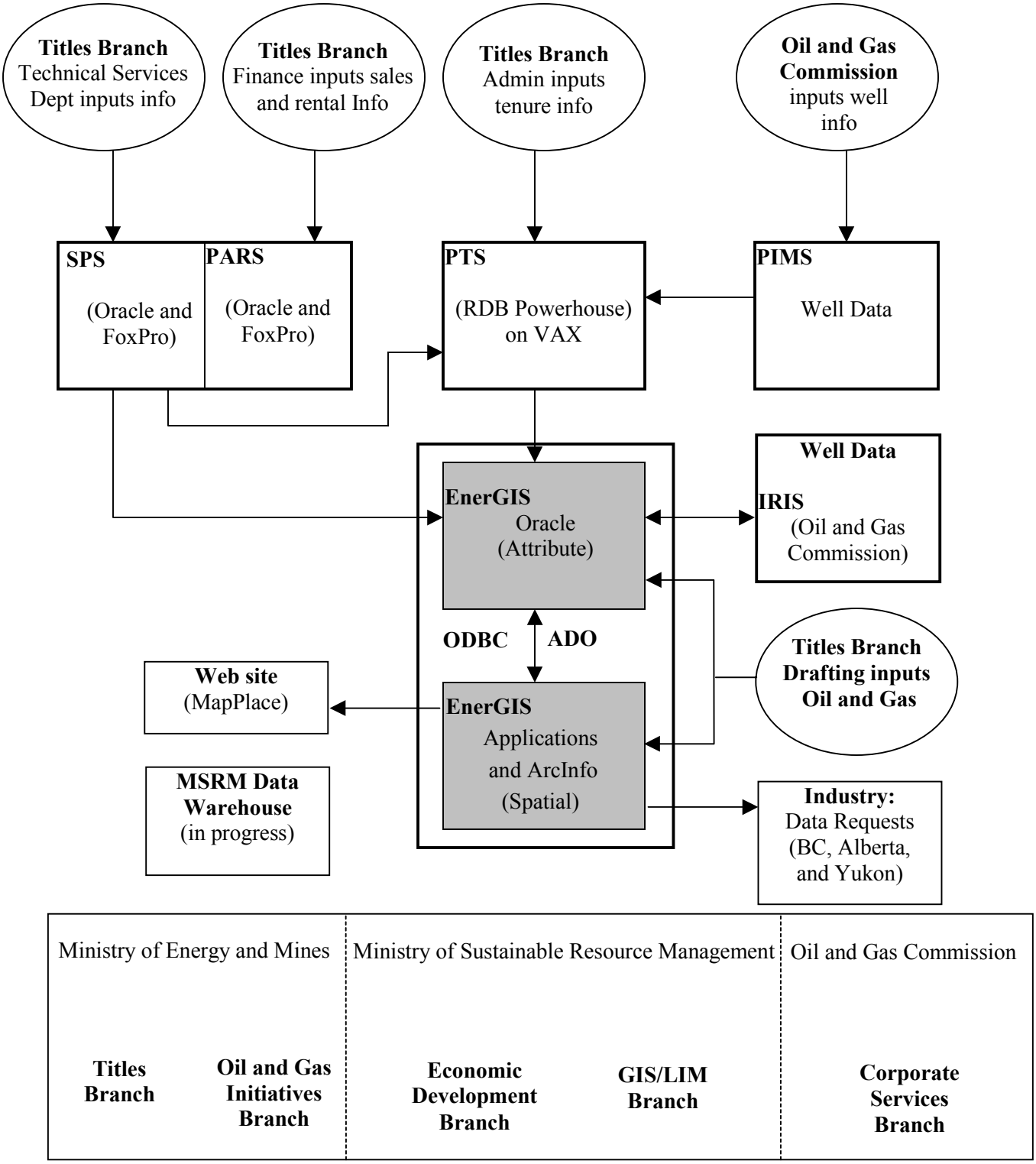
Completed information template sent by Rosa Munzer May 31, 2002.

Confirmed: Jack Leedham July 11,2002

Dates

Date Collected	Reviewed	Confirmed
5/22/02	07/04/02	07/11/02

Figure 20 - EnerGIS Link



Ministry of Sustainable Resource Management – Land Tenures – Spatial Maintenance

Clients / Relationships / Dependencies

- Primary client is Land and Water BC (LWBC), along with internal government staff in support of Approval process for Crown Lands.
- Other major clients are Ministries that use our spatial data for decision making for a variety of purposes (e.g. Treaty Negotiations, Resource Planning, etc.).
- Also perform Quality Control for BC Parks Spatial data.

Products & Services Provided

Spatial Data Management

Maintain a spatially continuous fabric of all Crown Land Surveys, administrative boundaries and Tenures under the Land Act.

- Process updates to Spatial data in Tantalis
- Make connection between Attribute & Spatial data
- Upgrade Spatial data in Tantalis (error fixes)
- Perform Quality Control for BC Parks Spatial data
- Reconciliation of ICI Spatial data
- Support Approval process for Crown Lands

Output Format

Hard Copy (maps, etc.)	Data Update	Tenure / License	Status / Advice
☒	☒	☐	☒

Service Initiation method

- Requests/Updates can arrive via hard copy, fax, phone, FTP or E-mail that can contain attachments in JPEG or spatial data formats.
- Error reports.

Input format

Hard Copy (form, letter)	E-Mail	Fax / Phone	BC Online
☒	☒	☒	☐

Business Process Description

Ensure that Spatial data is created, updated and accurate and is properly linked to Attribute data in support of the Tenure Application and Land Status process, new surveys and in processing updates based on error reports.

Approval Process

Support role only

Approval Request via

Hard Copy (form, letter)	E-Form	Fax / Phone	Mail
☐	☐	☐	☐

Documentation Requirements

- Sketch
- File
- Parcel Number
- Survey Plans

Estimated Turnaround Time

Process Request	Research/Retrieval	Approval Process	Notify Client
2 – 3 Weeks Elapsed			

Charges / User fees

Information Needs

- BC Online for plans (Private Land)
- Statutory Right of Way (Oil/gas pipeline) on Crown Land
- TRIM data
- TRIM Watershed Atlas (TWA)
- Survey Control

Registry information

Updated	Researched only (rarely)	External Registry
☒	☒	☒

Access to Registry information

Online	Manual	Automated via application
☒	☒	☒

Registry information Viewing

Web-enabled	Spatial Data	Special Software Required
☒	☒	☒

Internal & External Partnerships

- Agreement with BC Parks to provide Q/A services on maps, etc.
- Working to modify spatial data where discrepancies are identified when matched up against ICI data (Tantalis based on original survey, ICI has higher quality data for Private Land.

Recommendations

TRIM data utilized is dated, has not been refreshed for several years. Dynamic access to regularly updated TRIM2 information would benefit process.

Survey Control data as well as Trim Watershed Atlas (TWA) Height of Land information should also be made available in the same way, dynamic access to the most up to date information.

Policy / Legislation, Standards / Practices & Guidelines

- Land Act, Land Survey Act, Land Surveyors Act, Land Titles Act
- Cadastral Data Management System Guidelines and Specifications for BC
- Administrative Boundary Specifications for British Columbia

Strengths & Opportunities

- Very competent group (all members have 15+ years experience, with background in surveys, understanding of land tenure, spatial software usage & programming, usage of custom tools built on top of ARCINFO and ARCVIEW)

Related Projects / Initiatives

- Integrated Cadastral Initiative (ICI)
- Integrated Data Warehouse (IDW)
- Ongoing effort to clear backlog of 1200 updates

Impediments/Issues

- Large updates currently cause server to crash, source of problem not yet determined – whether network or working server.
- No formal process in place for surveyors to submit digital survey plans.
- Backlog of 1200 updates.
- Unable to easily update Administrative Boundary Management System (ABMS).
- Unable to store GPS information.
- No tools for Integrated Cadastral Initiative (ICI) reconciliation.
- More error checking software needed.

Data Quality / Currency Issues

- Lack of digital updates, mostly sent on hard copy.
- Spatial data missing in Lower Mainland.

Integrated Registry

Urgently Required	Some benefit to process	No impact on internal process
☐	☐	☒

Documentation of Work Flow and Technology Environment

Provided	To Follow	Not Available
☐	☐	☒

Information Source

- Scott MacPhail, Unit Head, Spatial Maintenance

Dates

Date Collected	To Follow	Not Available
17/6/02	20/06/02	21/06/02

Ministry of Sustainable Resource Management – Land Tenures – Attribute Maintenance

Clients / Relationships / Dependencies

Provide support for Land Use Applications/Approvals/Status Requests may be initiated by MSRM Regional Offices, Land Title Offices, Energy & Mines, Government Agencies, government staff performing land use approvals, BC Parks, Land and Water BC, Ministry of Forests, Public, Mapping companies, and Surveyors.

Besides the actual Attribute maintenance, this group supports inquiry requests, requests for in depth statuses, interpretive support for legal claims, as well as requests for support to resolve spatial update issues.

Products & Services Provided

Attribute information is maintained:

- Maintain data integrity in Tantalis with additions, updates, deletions, fixes

Land status researched/identified/confirmed:

- Provide information for reconciliation of spatial shape & attribute data
- Validate correct parcel structure to reflect business of Crown Lands

In depth status requests:

- Requests from Regional offices, also to support legal claims/disputes, investigations re First Nations treaty settlement, etc.
- Research primary parcels (original surveys of Crown land, prior to subdivision); Crown land survey parcels (records of surveys over Crown land); Crown land interest parcels (tenures, rights of way and reserves); and encumbrances on Crown land survey parcels (a listing of all rights to Crown land, including ownership, tenure and right of way rights)
- Information from GATOR-Tantalis, BC OnLine - ALTOS, BC Assessment, original Crown Grants, survey plans, field books, microfilm records, etc. may need to be researched.

Output format

Hard Copy (maps, etc.)	Data Update	Tenure / License	Status / Advice
☒	☒	☐	☒

Service Initiation method

Land information is requested by phone, fax, mail, email, and in person by:

- Industry or individuals who require information on the location and extent of Crown land interests;
- Government bodies requiring information on any prior interests in Crown land before allocating new interests in Crown land;
- Researchers who are looking for the history of how provincial lands were alienated (committed to private use), to assist in resolving current issues (historical information is a particularly important consideration in many of the First Nations land issues; and
- Individuals who require current and historical land records.

Updates re Reversions and Transfers are initiated by notices mailed into branch.

Input format

Hard Copy (form, letter)	E-Mail / E-Form	Fax / Phone	BC Online
☒	☒	☒	☐

Business Process Description

Updates, investigations, discrepancy/audit reports:

- Tantalis updated with additions, updates, deletions, fixes
- New survey plans created as required
- New PINs created as required

Reversions, Transfers, Order in Council:

- Tantalis updated to reflect changes
- Notify Regional office & other government agencies

In depth status requests on individual parcels:

- Ensure data integrity of registry is correct
- Research primary parcels (original surveys of Crown land, prior to subdivision); Crown land survey parcels (records of surveys over Crown land); Crown land interest parcels (tenures, rights of way and reserves); and encumbrances on Crown land survey parcels (a listing of all rights to Crown land, including ownership, tenure and right of way rights)
- Information from GATOR-Tantalis, BC OnLine - ALTOS, BC Assessment, original Crown Grants, survey plans, field books, microfilm records, etc. may need to be researched
- Notify requester.

Approval Process

N/A

Approval Request via

Hard Copy (form, letter)	E-Form	Fax / Phone	BC Online
☐	☐	☐	☐

Documentation Requirements

- File notifications of Reversions
- Transfers
- Orders In Council.

Estimated Turnaround Time

Process Request	Research/Retrieval	Approval Process	Notify Client
	Varies		

Charges / User fees

Information Needs

- Registry information (mineral, forestry, water, land):
  - TANTALIS
  - TANTALIS-X
  - GATOR
  - BC OnLine
  - ALTOS – Land Title Registry System
  - British Columbia Assessment System
  - MiDA – Mineral Data BC, Mineral Tenure
  - FTAS – Forest Tenure Administration System, Forest / Range Tenures
  - ATLAS
  - FAMAP – Forest Atlas
  - WLIS – Water License Information System
- Federal government Land Grants web site
- Archaeology data
- Land Act Tenure
- Water Tenure
- Cadastre - Survey Information (Crown and Private Lands)
- LTO - Land Ownership information
- Administrative Boundaries (regional district, municipal)

- Legislation/Regulations (for historical statutes)
- Parks
- Recreation areas
- Reserve data – WHMA, Provincial Forest, Agriculture Land Reserve
- Federal Government Indian Land Registry (plans, history of Indian Reserves)
- Original documents:
  - Crown Grants
  - Survey plans
  - Field books
  - Microfilm records
  - Orders In Council, Federal and Provincial
  - Dominion Patents
  - Official & Reverted Land Registers

Registry information

Updated	Researched	External Registry
☒	☒	☒

Access to Registry information

Online	Manual	Automated via application
☒	☒	☐

Registry information Viewing

Web-enabled	Spatial Data	Special Software Required
☒	☒	☒

Internal & External Partnerships

- Surveyor General re survey parcel structure
- Registries Spatial Updates
- Land Titles Office
- LWBC

Recommendations

- Definite need for view of all land interests.

Policy / Legislation, Standards / Practices & Guidelines

- Land Act
- Land Survey Act
- Land Surveyors Act
- Land Title Act
- Boundary Act
- Coal Act
- Mineral Tenure Act
- Petroleum & Natural Gas Act
- Pipeline Act
- Railway Act
- Ministry of Lands, Parks and Housing Act
- Property Law Act

Strengths & Opportunities

- Overall business process knowledge of team.
- Ability to interpret data and relate same.

Related Projects / Initiatives

- Unformatted Legal Breakdown project
- Integrated Cadastral Initiative (ICI)
- Integrated Data Warehouse project
- Reconciliation of Primary PINs/Shapes

Impediments/Issues

- LTO historical data still requires manual research, as ALTOS only carries information from a historical cutoff point.
- TANTALIS houses active and recently inactive details, but does not carry all historical data. Since not all of historical information was loaded into CLARIS (stopped updating manual registers in 1985, but not all details loaded), the subsequent conversion to TANTALIS carried this problem forward.
- Scanned images of Crown Grants, field books, survey plans only available through external GATOR, requires 'session hopping' to retrieve information.
- ICI and Crown Land Registry have differing business needs, and the ICI 'view' alone may not suffice for Crown Lands administration (e.g. shows current position of shoreline vs. historical position which is what the CG was issued on).

Data Quality / Currency Issues

- Some of the historical data is in poor condition, and may contain features such as shading that will not be visible on a scanned document, thereby compromising the information accuracy.
- In depth status reviews are labour intensive, and require both overall knowledge of the business process as well as the ability to interpret cryptic hand written notes (sometimes in the margins), which form a legal basis for a claim.
- Data fusion (attempt to 'fuse' spatial & attribute components of Tantalis) errors backlog.

Integrated Registry

Urgently Required	Some Benefit to Process	No Impact on Internal Process
☐	☒	☐

Documentation of Work Flow and Technology Environment

Provided	To Follow	Not Available
☒	☐	☐

Information Source

- Darlene Cockle

Dates

Date collected	Reviewed	Confirmed
6/19/02	07/05/02	07/10/02

Ministry of Sustainable Resource Management – Forest Tenures

Clients / Relationships / Dependencies

Forest Districts Operations, Licensees, Major Tenures, TFL & TSA holders, and other ministries initiate a "Status Request" to determine what interests or rights exist over a specified parcel of land.

The Forest Tenure Section accesses the information maintained in a number of applications and stand-alone databases in order to identify via a conflicts report all encumbrances on the specified land. They will work to assist the adjudication process, providing feedback on required changes (portions to be removed, etc.).

Products & Services Provided

- The Forest Tenure Section, in carrying out its statutory obligation, undertakes certain procedures to ensure that, when issuing agreements or permits under the Forest Act, it does not authorize an act of "intrusion" over an existing right or interest. Statusing provides a legal basis for the issuing of agreements by identifying what interests or rights exist over a specified parcel of land.
- FT section generates spatial database depicting all Forest and Range Act Tenures, Forest Interests and Forest Administrative Boundary
- The section also responds to inquiries for planning, FOI requests and requests in settling land claim issues.
- Provides consultation services & further research accessing resources in their office that are not available in the districts such as access to historical registers and maps, legal documents, old files etc.
  - To protect the District offices from unnecessary legal costs and embarrassment;
  - To assist in the determination of availability of land;
  - To assist in the process of issuance of permits;
  - To report inconsistent data to the appropriate ministries;
  - To assist with special projects; and
  - Part of the clearance process.

Output format

Hard Copy (maps, etc.)	Data Transfer	Tenure / License	Status / Advice
☒	☒	☐	☒

Service Initiation method

- Manual population of forms / mailed or electronic / emailed applications.
  See Approval Process

Input format

Hard Copy (form, letter)	E-Form	Fax / Phone	BC Online
☒	☒	☐	☐

Business Process Description

- Applications for tenures by licensees are processed through the District offices, which update the Forest Tenures Administration System (FTAS) and prepare Exhibit A's (manual & digital) which are forwarded to the Status Section for processing.
- The "Request for Clearance" process is performed by Forest Tenures staff:
  - Researching a variety of registries and databases
  - Dealing with exceptions through research and accumulated business knowledge (e.g. cases where certain rights retained on part or a whole land parcel after transfer)
  - Identifying all conflicts (Conflict Report)
  - If there are conflicts that need to be excluded from the application the status section will identify what exactly requires resolution
  - Clearance may be issued "conditionally".
- Following Clearance, Forest Districts update FTAS (attributes) and FAMAP/INCOSADA (spatial), and notify applicant.

Approval Process

Manual Process District creates the Exhibit A, fills in the top portion of the FS195 and mails the package to Registry Branch in Victoria for processing. FT Mapping section plots the application on the Forest Atlas, provides a map report of all known conflicts and forwards clearance to the Status section. The status clerks use the map report as a basis for statusing but also look for any other potential conflicts that may arise from other resources. They give direction to the mapping section for removal of any non-compatible conflicts that are found and ensure the area has been changed on the Exhibit A. Once the Forest Atlas and Exhibit A have been updated with these changes the status clerk completes the clearance adjudication and adds any further recommendations required for the district. A copy of the completed clearance package is mailed back to the district and also certain regions wanting a copy. Currently there are approximately 11 Districts being processed manually.

Xecis/Hector This is the first attempt at automating the clearance process The Digital Exhibit A and FS195 are now sent by the Districts through ODM directly to the Status section for processing. The majority of these Districts have been trained in doing their own map reports, which means the status clerks would give direction to the District mapping staff to make the necessary changes to the Exhibit A. When the District has made the requested changes the status clerk would then complete the adjudication of the clearance and notify the District by e-mail. The electronic clearance is transferred from the status section to Quality Control for final check on the accuracy and completeness before being exported through ODM to the District. Currently there are approximately 28 Districts being processed this way.

Incosada Eventually this will replace both the manual and Hector clearance processes. At this point in time Campbell River is one of the Districts submitting clearances using the Rollup file process sent through IODM to Victoria. This system has only been in place for several months and presently we are in the process of identifying flaws and requesting changes as we learn more about it. The little bit we know so far is that the District creates a Rollup file for the clearance application and notifies Victoria by e-mail that we have a file waiting to be processed. This Rollup file may contain a few clearance submissions each with their own map report for the Status clerks to work on. The Rollup file goes through Quality Control first and if it's ok the file is then forwarded to Status for processing. If there are conflicts that need to be excluded from the application the status clerk creates a job memo for the district identifying what exactly requires resolution. The Rollup is returned to the District to complete any required changes and after resolution of conflicts identified by Status, the District can then post to the Atlas for updating. Incosada shifts the responsibility of ensuring all conflicts are resolved to the District level where previously Status clerks adjudicated the clearance after making sure all changes were made.

Approval Request via

Hard Copy (form, letter)	Email / E-Form	Fax / Phone	Mail
☒	☒	☐	☒

Documentation Requirements

- Exhibit A
- FS195 - Forest Tenure application

Estimated Turnaround Time

Process Request	Research/Retrieval	Approval Process	Notify Client
	varies – hrs to mnths		

Charges / User fees

Information Needs

• Forest Tenure Application System	• FTAS	• Forest tenure information
• Gator	• GATOR	• Access to Tantalis
• Land Title System	• ALTOS	• Land Title System
• BC Online	• BCOnline	• Access to ALTOS, Corporate Registry, etc.
• Mineral Tenure Data Warehouse	• MiDAS	• Mineral tenure ownership & maps, site location, purpose
• QRMS	• QRMS	
• Hector	• Hector	• Exhibit A and Forest Tenure application
• Object Distribution Management	• ODM	• Online Forest Atlas
• Incosada Object Distribution Management	• IODM	
• Agricultural Land Reserves	• ALR	• Digital land reserve info
• BC Assessment		• Taxes being paid
• Real Property projects database		• Registry for Forest Service Roads, etc.
• Tenure Red Book Registries		• Manual/paper tenure registry (old timber sales)
• 0 File Green Books - used when MOF and LANDS were one ministry and stated their interests under 0 – Files		• Registers files (history & reference)
• Scanned LTO Plans		• Some available
• Archeology		
• Land District Lot Books		
• Township Plans		
• Official Land Act Plans		
• Subdivision Plans		
• Field Notes		
• Crown Grants (paper)		
• Dominion Fiats		
• Well Sites		
• Official Lands Registries		
• Microfilmed Lands Files		
• Cards with LTO Subdivisions		
• Microfilmed Crown Grants		
• Timber License cross reference		
• Sharyl's" database		• Internal database based on FTAS info
• Applicable Acts and Subsidiary Agreements		
• MapView for the Web		• Tool, access Land Use Reports, drill down
• Forest Atlas Mapping Automation Process	• FAMAP	• Drawing tools & workflow

Registry information

Updated	Researched	External Registry
☐	☒	☒

Access to Registry information

Online	Manual	Automated via application
☒	☒	☐

Registry information Viewing

Web-enabled	Spatial Data	Special Software Required
☒	☒	☐

Internal & External Partnerships

- Forest Districts Operations (their responsibility to update tenure info.)
- Separate agreements with other government ministries/agencies (formal & informal) in order to access/share information.

Recommendations

- When tenure issued, this information should be carried forward to be shown in Tantalis/Gator or as part of an integrated view of encumbrances.
- Land Act tenures should be shown spatially... (E.g. description might say 40 hectares, 6 covered by lease. This requires ordering a sketch from LWBC)
- Integration should present one format of information or at least consistent so that conversion routines can work without constant modifications.

Policy / Legislation, Standards / Practices & Guidelines

- Forest Act
- Policies & Procedures on Statusing

Strengths & Opportunities

- Staff have knowledge & skills based on experience to make proper interpretations of available information in order to base decisions.
- Agreements with many information sources are informal / risk here.
- A “must” to always review Gator & LTO (Tantalis dropped tenure info).

Related Projects / Initiatives

FTS Vision projects:

- Forest Tenure Online project: The vision is that Forest & Range Act Tenures will be processed over the Internet. SBFEP will access this application as will Licensees. It was created to allow users to view dynamically created Forest Tenure maps within a web browser. This provides a powerful and innovative solution for Internet mapping and geographic information systems (GIS). Sharing this information across the Internet enables Private and Public sectors instant access to a broad range of data for research, planning, maintenance, and general interest purposes. Licensees are also able to input Applications for Cutting/Road Permits online.
- INCOSADA Conversion project: Conversion effort involving conversion of all Forest Act, Range Act, Vegetation Resources Inventory data and all required base information, goal is to provide an accurate and standardized set of corporate spatial and attribute data with common database structures. This will involve taking electronic and/or manual data and "cleaning" it to Incosada standards, taking it from IGDS and moving it to SDE (data warehouse).

Impediments/Issues

- Crown Lease information not in BC Online.
- Data Quality as well as multiple formats, differing standards, etc.
- Statusing still a labour intensive activity due to the interpretations (based on business knowledge) of information required.
- Access too much of the information is currently manual.

Data Quality / Currency Issues

- Accuracy with mapping data an issue:
  - Conversions over years
  - Different flavors of data
  - Much is inaccurate / out of date
  - Not spatially "clean" as yet
  - Missing links for spatial / attribute data
- Multiple formats of data requires maintenance of many conversion routines.

Integrated Registry

Urgently Required	Some Benefit To Process	No Impact on Internal Process
☒	☐	☐

Documentation of Work Flow and Technology Environment

Provided	To Follow	Not Available
☒	☐	☐

Information Source

- Olga Kopriva
- Gordon Lloyd

Dates

Date collected	Reviewed	Confirmed
05/27/02 06/26/02	07/10/02	7/12/02

Ministry of Sustainable Resource Management – Archaeological Planning and Assessment

Clients / Relationships / Dependencies

Archaeological Planning and Assessment, Registries Department, administers a permit system under the Act, represents archaeological resource interests on review committees established under the Environmental Assessment Act, and provides archaeological resource input to the development of provincial Land and Resource Management Plans.

Products & Services Provided

Heritage Resource Inventory Application information is maintained:

- Maintain Provincial Heritage Registry with additions, updates

Manage the permitting process for property owners, land developers:

When making a decision or recommendation as to issuance of a permit under Sections 12(2) and 14(2) of the *Heritage Conservation Act*, the Archaeology Branch will take into account the following:

- The nature and justification of proposed activities;
- The training, experience and logistical ability of an applicant to successfully complete the proposed activities (inspection and investigation permits only);
- Comments provided by any First Nation known to assert a traditional interest in the area of the proposed activities; and
- Other relevant information

Output format

Hard Copy (maps, etc)	Data Transfer	Tenure / License	Status / Advice
☒	☒	☒	☒

Service Initiation method

- Applications may be obtained from the website or in person at the office by
- Industry or individuals.
- There are three basic categories of activities for which permits are most often sought: academic research, resource management, and alterations to sites to facilitate development. Academic research and resource management activities most often require heritage investigation or inspection permits pursuant to Section 14(2), while alteration permits are sought under the provisions of Section 12(2).

Input format

Hard Copy (form, letter)	E-Mail / E-Form	Fax / Phone	BC Online
☒	☒	☐	☐

Business Process Description

The Branch exercises various responsibilities that include:

- Establishing impact assessment and management guidelines, professional standards, and reporting requirements,
- Reviewing development proposals to determine the proponent's required level of involvement in the archaeological assessment process,
- Preparation of "orders" and "permits" pursuant to the *Heritage Conservation Act*,
- Providing guidance or direction to the proponent and consultants throughout the archaeological assessment process,
- Providing consultants with access to archaeological site files, maps, and other documentary materials maintained within the Ministry,
- Ensuring that First Nations who could be affected by decisions are given an opportunity to have their concerns considered prior to making decisions,
- Monitoring field aspects of archaeological impact assessment and management studies for compliance with terms and conditions of "orders" and "permits",
- Reviewing reports and research proposals for relevance, completeness and objectivity, and
- Establishing terms and conditions for project approval.

Approval Process

- The Branch may conduct as many as three formal reviews for major project developments. The first involves an examination of the proponent's application for a Project Approval Certificate to determine whether further involvement in the archaeological assessment process is required. Therefore, the application should include an archaeological overview. The second review, if necessary, is to evaluate the Project Report, which should include an archaeological impact assessment. The third review is to assist in the preparation of the terms of reference for an Environmental Assessment Board hearing, if required, and will address archaeological impact management issues.

Approval Request via

Hard Copy (form, letter)	E-Form	Fax / Phone	Mail
☒	☐	☐	☒

Documentation Requirements

Estimated Turnaround Time

Process Request	Research/Retrieval	Approval Process	Notify Client
	Varies		

Charges / User fees

Information Needs

- Registries, Land Titles
- Archaeology data

Registry information

Updated	Researched	External Registry
☒	☒	☐

Access to Registry information

Online	Manual	Automated via Application
☒	☒	☐

Registry information Viewing

Web-enabled	Spatial Data	Special Software Required
☒	☒	☒

Internal & External Partnerships

- Registries
- Land Titles Office
- First Nations
- MOTH (sub-division of non-incorporated)

Recommendations

Policy / Legislation, Standards / Practices & Guidelines

- Heritage Conservation Act

Strengths & Opportunities

Related Projects / Initiatives

- Remote Access to Archaeology Data (RAAD) project in testing phase, waiting on BceID. Vision is to provide access to archaeological data (spatial & attribute) to the archeological consulting community, internal government users and First Nations. Application level security will control access to sensitive data.
- Heritage Resource Inventory Application (HRIA) utilizes an Oracle database and ESRI technology to combine spatial and tabular information. ARC/INFO is used to edit spatial data, ARCVIEW 8.1 to view.

Impediments/Issues

- Legal definition of what information should be in registry contributes to backlog of sites not included.

Data Quality / Currency Issues

Integrated Registry

Urgently required	Some Benefit to Process	No Impact on Internal Process
☐	☒	☐

Documentation of Work Flow and Technology Environment

Provided	To Follow	Not Available
☒	☐	☐

Information Source

Doug Glaum

Dates

Date Collected	Reviewed	Confirmed
06/19/02	07/05/02	

Ministry of Sustainable Resource Management – Integrated Cadastral Initiative

Business Process

- Create the Integrated Cadastral Fabric

Business Process Description

- Create the Integrated Cadastral Fabric dataset to be made available to other organizations so that they can add their data.
- Essential cadastral base (ICF) to be completed in three years.

Internal & External Partnerships

- Government (BC) Utility Companies (BC Gas, Telus, Shaw Cable, Centra Gas, West Coast Energy, Hydro)
- Local Governments
- Various other organizations (Tantalus, Agriculture Land commission, BC Parks, others)

Services Provided

- Access
- Distribution (to export the data for manipulation – geometry matching)
- Storing the resulting dataset (after the manipulation)

Product / Service description

- Access (Currently, the production of the ICF requires access to Land Titles and Crown Land Registries, BC Assessment database, and TRIM. All are being accessed directly.)
- Distribution (To be arranged. It is the current intent of the Society that a private sector company be engaged for the purpose of providing data access services. Expected implementation date – Circa Dec 2002)\
- Analysis

Information Needs

- Administrative Boundaries (there are 14 kinds of boundaries – parks, schools, land titles, agricultural land, reserves, etc.)
- BC Assessment data
- Land Titles Registry.
- Survey Control (source is MSRM – base mapping, survey general)
- Tantalis (Registries division)
- TRIM (Base mapping)
- Integrated Cadastral Fabric (created by MSRM and added to by many other organizations – this includes Tantalis, Agricultural land commission, BC Parks, and owners of the following:

- Value Added datasets:
  - Heritage Conservation
  - Contaminated Sites
  - Forest Tenures
  - Mineral Tenures
- Municipal data (from municipalities that are partners in ICI)
- Utility data (from utilities that are partners in ICI)

Impediments/Issues

- This scenario is currently being performed from the operational systems, but could be modified to use the warehouse.

Ministry of Forests – Resource Tenures & Engineering Branch –
Small Business Forest Enterprise Program

Clients / Relationships / Dependencies

- Timber sold and harvested through the SBFEP supports more than 11,000 direct forestry jobs province-wide. Access to Crown timber is provided for Program Registrants who are market loggers, small sawmill operators, lumber re-manufacturers, specialty wood products manufacturers, and salvage operators.
- Contractors provide goods and services to the program.

Products & Services Provided

- Program Registration*:* The SBFEP was created to provide access to Crown timber for smaller independent forest operators registered with the program:
  - Category one – market loggers
  - Category two – sawmill operators, value-added processors and re-manufacturers
  - Category three – registrants who do not have a mill or processing facility, but commit to building one.
- Timber sales*:* by competitive bid on standing timber by sealed tender. Contract to harvest imposes certain obligations.
- Contracted Services: Contractors provide goods and services to the program. Contracts are issued for a variety of activities, including: timber cruising, layout, surveys, road construction, bridge construction, site preparation, planting, brushing/weeding, mapping, and harvest plans.
- Small Scale Salvage Initiative: Provides opportunities for salvagers to buy imperiled timber that is available for harvest.

Output format

Hard Copy (maps, etc)	Data Transfer	Tenure / License	Status / Advice
☒	☐	☒	☒

Service Initiation method

- An application for Registration in SBFEP must be approved/processed in order for the registrant to bid on crown timber.
- Timber sales are advertised in the BC Gazette, local newspapers and on the Internet.
- Registrants submit sealed bid, winner of bid is issued a Timber Sale License.
- Contracts are let through open tendering with initial notification through ads in the BC Gazette, local newspapers, BC Bid, or there may be a select invitation to bid, or a rotation from a “Pre-approved” list.

Input format

Hard Copy (form, letter)	E-Form	Fax / Phone	BC Online
☒	☒	☐	☐

Business Process Description

SBFEP activities:

- Initial map identification of a potential stand of timber (may / not be within a chart area for the program) - TSP
- Recce of area on the ground – TSP or contractor
- Insert into development plans – TSP or contractor
- Provide layout – Contractor
- Access construction - Contractor
- Sell timber – TSP
- Harvest Timber - Registrant
- Silviculture activities over next 12 – 15 years to Free Growing - Contractor

FTAS forest file identification gives the timber sale (TS) or non-replaceable forest license (NRFL) number from an automated system that sequentially issues the numbers. These are generated at the planning stage when there is little timber sale specific information available. To "Fast Track" a regular TS may take a year. The average is 5 years from generation of the TS number to the selling of the land for timber.

Approval Process

- Review applications to register in SBFEP, approve, notify registrant.
- Timber sales require review of SBFEP Declaration prior to entering into a harvesting agreement.
- Clearance process to determine availability of timber (no encumbrances, etc.) is handled by MSRM Forest Tenures. In some cases this can be performed 'in-house' within a District office. e.g. unsurveyed land.
- Clearance can take anywhere from 1- 2 weeks for small requests, 4 – 6 weeks for large requests, up to 9 weeks.

Approval Request via

Hard Copy (form, letter)	E-Form	Fax / Phone	Mail
☒	☐	☐	☒

Documentation Requirements

- FS 590A – Application for Registration in SBFEP for an Individual
- FS 590B – Application for Registration in SBFEP for a corporation
- FS 592 – Small Business Forest Enterprise Declaration

Estimated Turnaround Time

Process Request	Research/Retrieval	Approval Process	Notify Client
	Up to 9 Weeks		

Charges / User fees

- $ 250 registration fee

Information Needs

- FTAS provides Timber Sale Number (TS) or Non-Replaceable Forest License (NRFL), numbers are sequentially assigned by the application
- Administrative Boundaries (Management Units - TSA/TFL, Administrative Units – Regions and districts)
- FEN (Forest ecosystem network
- Forest Appraisals (GAS)
- Forest Cover (FC1/FIP, Veg, Resource inventory)
- Forest Development Plans (FDP) – operational planning
- Landscape Units (LU) (spatial and attribute)
- Landscape Unit Plans – LRMP, Coastal plans – and objectives
- CRUISE information
- Local level data
- OGMA (old growth management areas)
- PAS (protected areas strategy), PA's (spatial and attribute)
- Watersheds
- Recreation
- Reserves
- Resource use, location, tenures (Resource Tenure Atlas)
- Road Network (forest and highway), creating new roads
- Silviculture data (ISIS, MLSIS), Adjacency criteria
- Sustainable Forest Management Plan
- Topography
- TRIM
- TSR information including timber harvesting land base
- Forest Atlas
- Land Status "Clearance"
- Fish & Wildlife info – referrals for habitat, fish streams, opening size and shape to accommodate habitat, traplines
- Major Licensees – especially if working in their chart area
- First Nations – referrals for their value/concerns
- Stakeholders – those identified in a clearance as having an interest in the area(s) to be harvested
- Water License information
- Oil & Gas Right of Ways

Registry information

Updated	Researched Only	External Registry
☒	☒	☒

Access to Registry information

Online	Manual	Automated via Application
☒	☒	☐

Registry information Viewing

Web-enabled	Spatial Data	Special Software Required
☒	☒	☐

Internal & External Partnerships

Land Status "Clearance" which indicates all "alienation" information is required when planning for a Timber Sale, and is obtained from the MSRM Forest Tenures group. Other partners:

- Fish & Wildlife – referrals for habitat, fish streams, opening size and shape to accommodate habitat, traplines
- Major Licensees – especially if working in their chart area
- First Nations – referrals for their value/concerns
- Stakeholders – those identified in a clearance as having an interest in the area(s) to be harvested
- Water License information
- Oil & Gas Right of Ways

Recommendations

- A central registry would facilitate planning related to Timber Sales, can be performed earlier so that plans to ameliorate impact can go forward.

Policy / Legislation, Standards / Practices & Guidelines

- SBFEP Policy
- The Forest Act
- Small Business Forest Enterprise Regulation
- Regulations: Advertising, Deposits & Dispositions

Strengths & Opportunities

- With the transition to a new structure, there will be fewer Timber Sales Offices (TSO) that do not report though a region but directly with Victoria. This will hopefully improve ability to meet the needs of clients by reacting more quickly to changes in circumstances.

Related Projects / Initiatives

- VMAR project
- FTAS migration

Impediments/Issues

- Transition to a new structure. Fewer TSO's, from 41 offices (1:1 relationship with forest districts) to 12 offices. This will mean greater distance from clients, both contractors and registrants.

Data Quality / Currency Issues

Integrated Registry

Urgently required	Some benefit to process	No impact on internal process
☒	☐	☐

Documentation of Work Flow and Technology Environment

Provided	To Follow	Not available
☐	☐	☒

Information Source

- Ross Thomson

Dates

Date collected	Reviewed	Confirmed
06/18/02	07/04/02	/ /

Ministry of Forests – Resource Tenures & Engineering Branch – Timber Tenures Section - Timber Marks

Clients / Relationships / Dependencies

- MOF District/Regional/HQ (various branches)
- Other government agencies/ federal government/ esp. private land owners (including major licensees)

Products & Services Provided

- Timber Mark certificates/renewals/amendments/cancellations
- Info regarding ownership rights to timber
- FOI requests (could cover anything with regard to marks including volumes/species by year, etc.)
- All info regarding crown and private marks

Output format

Hard Copy (maps, etc.)	Data Transfer	Tenure / License	Status / Advice
☒	☒	☒	☒

Service Initiation method

- Fax
- Mail
- In-person

Input format

Hard Copy (form, letter)	E-Form	Fax / Phone	BC Online
☒	☒	☒	☒

Business Process Description

- Process application to allow the movement of timber from private lands. Protect the crowns interest regarding stumpage; determine exportability/non-exportability under Sec 127 of Forest Act; misc. inquires; (and protection of the interests of private land owners). …ASSIGNMENT OF APPROPRIATE MARK

Approval Process

- Determine thru research of land titles, Gator, FTAS, Corporate registry, various other registries (some federal) to determine proper timber mark for private lands; recommendation of stumpage bearing marks if need be miscellaneous requests.

Approval Request via

Hard Copy (form, letter)	E-Form	Fax / Phone	Mail
☒	☒	☒	☒

Documentation Requirements

- Titles and charges;
- Some BC assessment searches (timber agreements/ timber grants);
- Forfeitures;
- Files; hard copy plans and other historical records which have been retained;
- Documents thru gator including crown grants; and
- Plans and field books.

Estimated Turnaround Time

Process Request	Research / Retrieval	Approval Process	Notify Client
10 Days	2 Days	10 Days	N/A

Charges / User fees

- None at this time, however there were at one point fees

Information Needs

- BC Online/Gator/Ftas/ Private Mark Registry (PMR esp.)
- Files/plans/other historical records; (various acts and regulations, including historical)

Registry information

Updated	Researched	External Registry
☒	☒	☒

Access to Registry information

Online	Manual	Automated via Application
☒	☒	☒

Registry information Viewing

Web-enabled	Spatial Data	Special Software Required
☒	☒	☒

Internal & External Partnerships

Recommendations

- Gator could be enhanced to show forest tenures and information in a sequence, which would be more favourable to the users, i.e. plans in order.
- All LTO plans, currently 300k – 400k plans on fiche.

Policy / Legislation, Standards / Practices & Guidelines

- Forest Act
- Forest Practices Code
- Land Act
- Land Title Act
- Mineral Act
- Logging Tax Act
- Various historical Acts

Strengths & Opportunities

- BC Online although very friendly system needs to possibly put more historical into the system, to make more documents available thru the web or fax.

Related Projects / Initiatives

Impediments/Issues

- Forest tenures pulled from Gator, should be with parcels
- LTO office being centralized to New Westminster, support may not be as timely.

Data Quality / Currency Issues

- See recommendation

Integrated Registry

Urgently Required	Some Benefit to Process	No impact on internal process
☐	☒	☐

Documentation of Work Flow and Technology Environment

Provided	To Follow	Not Available
☐	☐	☒

Information Source

- Paul Gateley
- Tina Johnson

Dates

Date Collected	Reviewed	Confirmed
6/25/02	07/04/02	/ /

Ministry of Energy & Mines – Titles Branch

Clients / Relationships / Dependencies

- The mineral exploration industry which includes individual prospectors, consultants and contractors, prospector consortiums or partnerships, small private and public companies, medium and large public corporations and the large mining corporations, these groups need to know what tenure exists in a specific area, who owns it, what is tenure status, location of tenure and in some cases historical data such as the total transactions related to a specific title, this info is needed in a timely way (0.5 day)
- Enforcement agencies such as RCMP, Stock Exchange, Securities Commissions, in the enforcement of their regulations and in the pursuit of civil or criminal investigations
- Other government groups such as MSRM for land planning prior to creating a new protected area, Mo Forests needing to know whom is in an area prior to issuance of a timber cutting permit or commencement of a road closure, Parks needing to know which titles are caught up in a park for compensation purposes, Highways using gravel or rock and stone for road building, LAWBC when alienating Crown lands, general public when checking activity on own land, MEM to track exploration and economic activity.

Products & Services Provided

- In terms of new applications, the vast majority is handled over the counter or by mail.
- Client access current data via home/library/office, in writing, in person and via contracted title search.
- Staff will check applications, calculate and collect fees, data entry information, manually update maps and prepare info packages for clients.
- MIDA provides an up to date d/b of all current and forfeited tenures back to approximately 1992. Tenure information for valid and forfeited titles exists in paper form from 1992 back in time.
- These forfeited titles are used in re-constructing tenure sequences and as a historic tie to exploration work.
- Staff will provide copies of current and forfeited tenures and all historical documents related to that title for a fee.
- Portions or full size copies of maps are provided.
- Opinions and tenure status, explanation of statute, regulation and policies is provided.

Output format

Hard Copy (maps, etc.)	Data Transfer	Tenure / License	Status / Advice
☒	☒	☒	☒

Service Initiation method

- Tenure application and other transaction documents are usually received in person or by mail.
- Request for detailed tenure history are usually received in mail.

Input format

Hard Copy (form, letter)	E-Form	Fax / Phone	BC Online
☒	☒	☒	☐

Business Process Description

- The Titles Branch provides the provincial registry system which includes enforcement of the Mineral Tenure Act and Regs, the Coal Act and Regs, the Registry system issue free miner certificates, records and issue title via new claim applications, records all other transactions related to title, (Statements of Work, Grouping, court orders, liens, bill of sale, etc.)
- Clients can access the recording system in any of 59 Government Agents office and the 2 Titles Branch offices in Vancouver and Victoria.

Approval Process

- Applications are checked for adherence to statute, policy and procedures, fees collected, title is issued, and copy provide to tenure holder.
- Other documents are similarly checked.
- Note that approval does not mean data entry.

Approval Request via

Hard Copy (form, letter)	E-Form	Fax / Phone	Mail
☒	☐	☐	☒

Documentation Requirements

- Require original paper in all cases

Estimated Turnaround Time

Process Request	Research / Retrieval	Approval Process	Notify Client
0.5 Days	5 Days	0.5 Days	2 Days

Charges / User fees

- Fees set in Regulation.
- See: http://www.qp.gov.bc.ca/statreg/reg/M/MineralTenure/MineralTenure297_88/297_88.htm#section21

Information Needs

- Require 24 / 7 access to MIDA from research point of view.
- Require business hours access to MIDA for registry (recording) function

Registry information

Updated	Researched	External Registry
☒	☒	☐

Access to Registry information

Online	Manual	Automated via Application
☒	☒	☐

Registry information Viewing

Web-enabled	Spatial Data	Special Software Required
☒	☒	☐

Internal & External Partnerships

- Internal partners include:
  - Sub-surface tenure unit of SRM, maintain data system but do not perform any data entry, they maintain and update digital mapping system;
  - Government Agents Branch has 59 offices throughout BC and provides full recording and info dispersal service.

Recommendations

Policy / Legislation, Standards / Practices & Guidelines

- Mineral Tenure Act and Regulations, Coal Act and Regulations, Mining Right of Way Act.
- Policy and Procedures manual.

Strengths & Opportunities

- Staff knows clients and is very industry focused.
- Recording offices are conveniently located throughout BC.
- The system has been largely unchanged and therefore is very well known to most regular clients.
- Recent legislative changes have been focused on enhancing the transparency of the process making it easier for clients.
- Web based applications offer significant saving for clients and the Branch

Related Projects / Initiatives

- SRM is nearly complete in making tenure maps available over the web in PDF format. This will serve to increase client use of web as an info tool.
- SRM is approximately 40% complete in the conversion of our mapping away from the 1950 era base maps to TRIM standard base mapping. This will provide significant increase in map quality and accuracy and will also serve to bring the titles maps to a consistent provincial standard.
- Titles Branch has initiated a project to convert tenure application to a web based process with electronic payment.

Impediments/Issues

- Dependency on mapping unit in another agency (SRM) reduces flexibility (loss of dedicated mappers) in meeting mapping pressures.
- Data management in another agency reduces pressure for systems tailored to client need.
- Current mapping procedures and staff resources are such that SRM is working with a 1100 new title plotting backlog generally reflecting 3-6 month old tenure applications, this in turn makes data quality uncertain.
- We have very limited ability to produce generalized or specialized lists based on client specific parameters.

Data Quality / Currency Issues

- Some significant data quality issues exist, this is currently being worked upon. Stan Hoffmann of SRM is a better contact on this issue.
- Mida system is getting old and has not had a major overhaul, but rather a series of patches; we could be getting close to a major failure.

Integrated Registry

Urgently required	Some Benefit to Process	No Impact on Internal Process
☐	☐	☒

Documentation of Work Flow and Technology Environment

Provided	To Follow	Not Available
☐	☐	☐

Information Source

- Rick Conte

Dates

Date Collected	Reviewed	Confirmed
06/20/02	07/05/02	07/09/02

Ministry of Energy & Mines – Petroleum Land Branch

Clients / Relationships / Dependencies

The Ministry of Energy and Mines manages the development of British Columbia's oil, gas, coal bed methane and geothermal resources, and implements policies and programs to encourage their economic development and maintain environmental integrity.

The Ministry of Energy and Mines regulates and inspects the exploration and production operations of British Columbia's geothermal industries to protect workers, the public and the environment. The Oil and Gas Commission are responsible for regulating and inspecting the on-the-ground activities such as exploration and production operations for oil and gas.

Clients are primarily the Oil & Gas industry, First Nations, local government, government agencies, ministry departments, public and the legal & financial community.

Products & Services Provided

Primary responsibilities:

- Issuance and management of oil & gas, underground storage and geothermal tenures, Permits, Drilling Licenses & Leases
- Collection of associated revenues
- Management of associated records & data
- Maintenance of tenure encumbrance registry
- The Petroleum Lands Branch maintains and operates the following automated systems in the delivery of its programs:
- PTS – Petroleum Titles System, which maintains information for all provincial petroleum and natural gas tenures
- PARS – Petroleum Accounts Revenue System, which maintains financial information on all petroleum and natural gas tenure related revenues
- SPS – Sales Parcel System, which maintains information on requests from the oil and gas industry for oil & gas rights

Output format

Hard Copy (maps, etc.)	Data Transfer	Tenure / License	Status / Advice
☒	☒	☒	☒

Service Initiation Method

Access to services via:

- Direct contact with branch staff
- Web – info letters, MapGuide map display & search tools
- Data downloads, monthly CD
- Category based service companies

Input format

Hard Copy (form, letter)	E-Form	Fax / Phone	BC Online
☒	☐	☐	☐

Business Process Description

- Hold Oil & Gas competitions in response to industry requests by:
  - Researching available rights
  - Configuring overlapping requests
  - Referral processes
  - Geological assessment of parcels
  - Advertising in Gazette
  - Hold competitions
- Examine documents submitted for recording
- Provide revenue forecasts
- Carry out standard government revenue financial management practices
- Provide the search information for industry & financial community

Approval Process

Approval Request via

Hard Copy (form, letter)	E-Form	Fax / Phone	Mail
☐	☐	☐	☐

Documentation Requirements

Estimated Turnaround Time

Process Request	Research / Retrieval	Approval Process	Notify Client

Charges / User fees

Information Needs

Collect & manage attribute records associated with oil, gas & geothermal tenures… location, owner, term, P&NL grid, etc.

- PTS – Petroleum Titles System, which maintains information for all provincial petroleum and natural gas tenures
- PARS – Petroleum Accounts Revenue System, which maintains financial information on all petroleum and natural gas tenure related revenues
- SPS – Sales Parcel System, which maintains information on requests from the oil and gas industry for oil & gas rights
- ENERGIS – geographic information system developed to manage spatial data related to oil & gas activities and land use planning processes. Note that application now supported by MSRM
- MINFILE contains geological, location and economic information on over 12,000 metallic, industrial mineral and coalmines, deposits and occurrences in B.C.
- MapGuide Viewer - Distributed to end-users free of charge, the Viewer enables non-technical users to interact with simple or complex maps, collapse or expand themed layers, make queries, create dynamic buffering zones, run custom reports based on selected objects, print to scale, and much more.

Information required from other sources:

- OCG PIMS database, IRIS - Applications Management Tracking System
- Indian Reserve Boundaries – Traditional Territories
- Municipal Boundaries
- LRMP zones
- Protected Areas
- Parks
- Wildlife & Habitat
- Any Land designation that impacts or restricts surface access

Registries accessed:

- LTO & GATOR for sub-surface ownership research

Most urgent requirements:

- Parks & Protected Areas
- First Nations Territories
- Sub-surface ownership

Registry information

Updated	Researched	External Registry
☒	☒	☒

Access to Registry information

Online	Manual	Automated via Application
☒	☐	☐

Registry information Viewing

Web-enabled	Spatial Data	Special Software Required
☒	☒	☐

Internal & External Partnerships

- Oil & Gas Commission – They approve on-the-ground activity on tenure. Data link/data sharing between PTS & OCG's PIMS database, IRIS application.
- MSRM – maintain ENERGIS, spatial coverage layers
- MSRM – Strategic Land use planning products
- Other government agencies through sale parcel referral process

Recommendations

- Take into consideration current capabilities/initiatives:
  - Currently are providing extensive information though the Internet
  - Sale bids are processed electronically through Automated Debit
  - Plan to collect rentals through Electronic Funds Transfer
  - Currently have map-based Internet display & search tool
  - Working with MSRM on Web Portal
  - Conducting business analysis of Electronic Service Delivery opportunities
- Data has to be available at minimal or no cost. Avoid the "TRIM" experience, good data but priced out of reach.
- Integrated Registries not an immediate requirement for Oil & Gas Tenure management, but could provide greater efficiencies by providing access to current and more accurate data.
- Integrated Registries will impact Oil & Gas Commission ability to make well approval decisions.

Policy / Legislation, Standards / Practices & Guidelines

- Petroleum & Natural Gas Act & Regulations
- Geothermal Resources Act & Regulations
- FAPRO – Government Financial Management Policy

Strengths & Opportunities

Strengths:

- Small group of knowledgeable, expert staff
- Robust & reliable system tools
- Accurate data
- Recognized by industry as accessible, responsive in service delivery
- Policy framework that is sufficiently flexible to allow for a higher level of service than in other jurisdictions

Opportunities:

- Enhance Web – based tools & interactive processing

Related Projects / Initiatives

- MSRM Web portal
- ESD opportunities

Impediments/Issues

- Government commitment to grow the industry in a period of restraint & cutbacks.
- Contingency Planning – staff.
- Limited sub-surface resource capability – Vancouver Island.

Data Quality / Currency Issues

Integrated Registry

Urgently Required	Some Benefit To Process	No Impact on Internal Process
☐	☒	☐

Documentation of Work Flow and Technology Environment

Provided	To Follow	Not Available
☒	☐	☐

Information Source

- Colin Magee
- Gerald German

Dates

Date Collected	Reviewed	Confirmed
06/14/02	07/09/02	/ /

The Mining Association of BC

Clients / Relationships / Dependencies

The Mining Association of British Columbia (MABC) speaks on behalf of mineral producers, the major component of a $4 billion industry in British Columbia.

MABC liaises with government legislators, lobby for regulatory advancement and publicly promote the economic and social value of mining.

Products & Services Provided

We provide our member companies with a wide variety of services such as:

- Facilitate participation in key government/industry committees,
- Distribute updates on regulatory change,
- Provide access to meetings that provide the opportunity to exchange information among members,
- Coordinate joint industry action on issues of common concern,
- Provide staff expertise on the areas of greatest interest.

Recommendations

- Promote a consultation period to allow for involvement of industry representatives up front in the design initiative.
- Ministry of Mines should be given statutory authority to grant and administer permits, licenses and approvals for exploration and operating mines as a one-window approach.

Impediments/Issues

- Mine permitting and attendant regulations in BC have become an expensive, time-consuming and unnecessarily difficult burden in comparison with other Canadian and most other international jurisdictions
- There is a need to institute changes to the permitting process and regulatory regime to make them more rational, more efficient and more attuned to the desired outcome

Data Quality / Currency Issues

Integrated Registry

Urgently Required	Some Benefit To Process	No Impact on Internal Process
☐	☐	☐

Information Source

- Lorne Grasley

Dates

Date Collected	Reviewed	Confirmed
06/27/02	07/11/02	/ /

Land Reserve Commission

Clients / Relationships / Dependencies

The Land Reserve Commission (LRC) is an independent Provincial agency dedicated to ensuring resource lands are available for BC's working farms.

The purpose of the Agricultural Land Reserve (ALR) is to protect agricultural land and to encourage farming.

Products & Services Provided

- The ALR is a provincial zone in which agriculture is recognized as the priority use. Farming is encouraged and non-agricultural uses are controlled.
- The Agricultural Land Reserve takes precedence over, but does not replace other legislation and bylaws that may apply to the land. Local and regional governments, as well as other provincial agencies, are expected to plan in accordance with the provincial policy of preserving agricultural land.

Output format

Hard Copy (maps, etc.)	Data Update	Tenure / License	Status / Advice
☒	☐	☐	☒

Service Initiation method

- Application forms are mailed / dropped off with government agent.

Input format

Hard Copy (form, letter)	E-Mail / E-Form	Fax / Phone	BC Online
☒	☐	☐	☐

Business Process Description

- Any person wishing to subdivide or use ALR land for non-farm purposes or to exclude land from the ALR, must submit an application to the Commission and obtain its approval.

Approval Process

- The Commission strives to process applications within 90 days of receipt. However, the length of time to process an application depends on the type of application and its complexity. Delays can occur if an application is incomplete or does not have the necessary documents or fee enclosed. Delays can also occur if the Commission feels it requires additional information such as an on-site inspection of the property by its farm advisors, staff agrologist, or members of the Commission. Additional information may also be required from the local government or other government agencies.

Approval Request via

Hard Copy (form, letter)	E-Form	Fax / Phone	Mail
☒	☐	☐	☒

Documentation Requirements

- Application form
- Sketch
- Legal description of land parcel

Estimated Turnaround Time

Process Request	Research / Retrieval	Approval Process	Notify Client
	varies		

Charges / User fees

- Yes, varies with application-

Information Needs

- BC Online
- LTO
- Maps, titles, charges, covenants, easements
- Crown tenure
- Forest cover
- Judgments on Title
- LWBC
- MEM

Registry information

Updated	Researched	External Registry
☐	☒	☒

Access to Registry information

Online	Manual	Automated via Application
☒	☒	☐

Registry information Viewing

Web-enabled	Spatial Data	Special Software Required
☒	☐	☐

Internal & External Partnerships

Recommendations

- Court Registry access would be useful…link to pending actions against title.
- Use BC Online extensively, but require phone calls to get specifics, so having all or most required information available would be a plus.
- Vision is to make ALR information available to other partners, provide the capability for E-File applications, e-payments, providing status reporting over the Web.

Policy / Legislation, Standards / Practices & Guidelines

- Land Reserve Commission Act
- Agriculture Land Reserve Act
- Soil Conservation Act
- In addition to the Acts, there are Regulations that identify procedures for submitting applications, specify land uses permitted in the ALR and specify fees.

Strengths & Opportunities

Related Projects / Initiatives

- Working Forest Initiative – Forest Land Reserve functionality going away. The new act amends the Forest Land Reserve Act removing Land Commission approval requirement for forest practices on private land.

Impediments/Issues

Data Quality / Currency Issues

Integrated Registry

Urgently required	Some Benefit to Process	No Impact on Internal Process
☐	☐	☐

Documentation of Work Flow and Technology Environment

Provided	To Follow	Not available
☐	☐	☐

Information Source

- Colin Fry

Dates

Date Collected	Reviewed	Confirmed
05/30/02	07/15/02	/ /

Corporation of Land Surveyors of British Columbia

Clients / Relationships / Dependencies

The Corporation of Land Surveyors of the Province of British Columbia is a self-governing body charged with the responsibility of setting educational requirements, examining for admission, and regulating professional land surveyors to perform legal surveys within British Columbia, Canada.

Products & Services Provided

The Corporation of Land Surveyors of the Province of British Columbia is the association governing the profession of land surveying within the Province. Created in 1905, the Corporation is governed by the Land Surveyors Act, a Provincial statute that sets out the framework within which the association and its members operate.

Business Process Description

The services offered by a B.C.L.S. are primarily governed by provincial statutes. The B.C. Land Surveyor provides expertise within all areas of land, water and space measurement. Services are generally grouped as follows:

- Cadastral
- Topographical Surveys
- Control Surveys
- Building Location Certificates
- Site Planning, Sub-division design & Consulting
- Layout and Engineering Studies
- Survey and Property Law
- Advanced Geomatics

Information Needs

- Registry information (mineral, forestry, water, land):
  - TANTALIS
  - TANTALIS-X
  - GATOR
  - BC OnLine
  - ALTOS – Land Title Registry System
  - British Columbia Assessment System
  - MiDA – Mineral Data BC, Mineral Tenure
  - FTAS – Forest Tenure Administration System, Forest / Range Tenures
  - ATLAS
  - FAMAP – Forest Atlas
  - WLIS – Water License Information System
- Federal government Land Grants web site
- Archaeology data
- Protected Area Registry

- Administrative Boundaries (regional district, municipal)
- Legislation/Regulations (for historical statutes)
- Parks, Recreation areas
- Reserve data – WHMA, Provincial Forest, Agriculture Land Reserve
- Federal Government Indian Land Registry (plans, history of Indian Reserves)
- Original documents:
  - Crown Grants
  - Survey plans
  - Field books
  - Microfilm records
  - Orders In Council, Federal and Provincial
  - Dominion Patents
- Official & Reverted Land Registers

Registry information

Updated	Researched	External Registry
☐	☒	☒

Access to Registry information

Online	Manual	Automated via Application
☒	☒	☒

Registry information Viewing

Web-enabled	Spatial Data	Special Software Required
☒	☒	☐

Internal & External Partnerships

Recommendations

- As a key stakeholder, as a business/working model is being established, the project team should consult with the Corporation of Land Surveyors.
- Incorporate an indicator of data quality (e.g. if true spatial position is known to be plus or minus 10 meters), then when displaying spatial information a "thick" line could be used to display graphically that the exact boundary is being shown with some degree of inaccuracy (buffer). If a user is to zoom in on such a parcel, buffer the parcel accordingly.

Related Projects / Initiatives

- Map Staking Initiative for Mineral Tenures, Digital plan submission for Private & Crown Land, Oil & Gas industry, Well Site plans. All projects dealing with spatial representation of land along with attribute information should communicate common interests, issues, and concerns.

Impediments/Issues

- Should encourage users to identify data anomalies in Tantalis, set up a mechanism to fix & advise the submitter.
- Cost of access to information IS an issue.
- All Registries not referenced in a common platform/base.

Data Quality / Currency Issues

- Tantalis data – 1 in 3 records not quite right compared to "true" records in vault at 3400 Davidson.

Integrated Registry

Urgently Required	Some Benefit To Process	No Impact on Internal Process
☒	☐	☐

Information Source

- Brent Taylor
- Bert Hol

Dates

Date Collected	Reviewed	Confirmed
05/30/02	07/30/02	/ /

25. APPENDIX H2

MSRM – Land Titles Branch (LTB)

Person Interviewed:

- Darcy Hammett

Date Interviewed:

- July 2, 2002

Interviewed by:

- Brendan Feary, (Fujitsu Consulting)
- Vern Danes (Fujitsu Consulting)
- JP King (MSRM-IMB)

Who are your clients and what products & services to provide?

- General public – Anyone (persons or organizations) involved in land transactions (i.e. buying, selling, transferring)
- Lawyers/notaries representing interests of general public in performing land transactions are primary clients.

How do clients access your products & services?

- Crown land for sale is listed in the MLS web site. This is the primary point of access.
- Current property listings also available on the LWBC web site and are published in LWBC catalogue

What processes and functions do you perform to deliver these products & services?

- Potential properties for sale are identified, evaluated and developed
- Process for determining whether property can be sold is based on the model used by the land management division and involves and may involve consultation and referral with other agencies, rezoning and having a survey performed.

What information do you collect and manage in carrying out these functions? What do you acquire from other sources? What registries do you currently use? What information is most urgent?

- Response is same as for Land Management Function
- Use ALTOS and BCAA extensively via BC Online.

What relationships with other organizations do you have in the delivery of your products & services?

- Signification relationship with BC Real Estate Association (re use of MLS) and member realtors
- What is your expectation for how these products & services might be delivered in the future and how the business processes might work? (e.g. Electronic Service Delivery)
- Current model of listing with the MLS works extremely well and should continue

What policy and legislative frameworks are you bound by?

- Same as land management function

What are your strengths? What opportunities to you foresee for improved service delivery?

What impediments and challenges are you facing?

- Identifying inventory is the most significant challenge (i.e. Where is the potentially marketable and valuable Crown Land?) Current process is not refined. GIS analysis and ICI holds significant promise here.

How do you perceive the need for an Integrated Registry?

- Sympathetic to the need for an integrated registry and the "Jill" concept
- Notes that understanding the distinction between the various land registries is very vague

What documentation can you provide that describes your current business process, data and technology environments?

- Refer to Web Site for overview and further information (http://lwbc.bc.ca/for_business/land_sales_development/index.htm)

MSRM – Decision Support Services (DSS)

Person Interviewed:

- Hally Hofmeyr

Date Interviewed:

- July 8,2002

Interviewed by:

- Vern Danes, Fujitsu Consulting
- Brendan Feary, Fujitsu Consulting

Branch Purpose

- DSS created July 2001 and is combined of resources from the former MELP, GDBC (BTM products), MOF, LUCO, MOTH, MAA and Tourism – felt that economies of scale could be created by combining resources from each of these agencies
- Involves staff who were engaged in analysis (GIS analysis) of land and resource information
- Formerly were losing staff to private sector and US
- Business has project/sectoral focus (e.g. BC Olympic bid, offshore oil & gas), not program focus
- Branch plays project management/consulting/analytic/business expert role on sectoral projects. May work with business professionals and academia to accomplish this.
- Hally interested in outcome of this phase of integrated registry project for 2 projects:
- Client access strategy – requirements and expectations for information and services
- Requirements to support the 'Jill' Scenario

Needs

- Major need for access to registry data for land use planning, sectoral projects and the treaty process. Registry information is fundamental to the processes and could have significant litigation implications for province if information is wrong, missing or inconsistent.
- Need to know 'who owns land (Crown or private)? Who has interests in the land? This also extends to adjacency and access.
- Need to know both registered (i.e. legal) and non-registered interests. Non-registered interests may include such things as community recreational areas or sensitive habitat areas. Also includes archeology, traditional use heritage and anecdotal data.
- Integrating data to support above processes has been extremely difficult in past because of different formats, standards, currency completeness and accuracy – there are HUGE data quality problems to be addressed.

- Hally estimates savings of up to 50% is data was more accessible, integrateable and of better quality.
- Hally suggested that client need to be involved in the process that will improve the quality of data over time including: currency (business latency), completeness, accuracy (both positional incorrect values).
- Another data quality problem experienced is that relationships between different types of tenures may not be known or apparent (e.g. foreshore and upland aquaculture tenure and relationship to water license for access.
- Hally suggested that focusing on delivery of integrated, quality registry data is more important than focusing on the end-user application that access and analyze the data. Feels that too often addressing data integration and quality problems takes a back seat to appealing technology solutions.

Integrated Data Registry Project Questionnaire – Consolidated Regional Responses

Date:

- July 12, 2002

Who are your clients and what products and services do you provide?

Clients:

- General public, industry (incl. Major Corporations), local government, federal and other provincial agencies, First Nations; consulting firms; lawyers; engineers; foresters; environmental stewardship groups; Real Estate Professionals.

Products:

- Land Act tenures over land and foreshore and licenses and approvals for use of surface water (Leases, Licenses, Permits, Transfers of Admin, Endorsements, Assignments, Water Approvals, Crown Grants, Order in Councils, Ministerial Orders);
- Approvals for doing work in and about a stream;
- Orders to amend existing licenses and approvals;
- Orders in regard to offences
- Mapping (to assist our clients)
- Crown land status info.

Services:

- Provide information on Land encumbrances and water licenses;
- Provide information on existing licences / tenures, fees and client accounts;
- Provide specific information and advice on land/water applications and water license amendment processes;
- Answer general inquiries on water licensing/approvals and Crown land tenuring and programs;
- Interpretation of policy and programs;
- Selling land
- Tenuring land and water
- Enforcement (trespass, monitoring, etc.)
- Decisions are posted for public access
- GIS

How do clients access your products and services?

- Letter;
- Telephone;
- Internet;
- Email;
- FAX; and
- In-person.

What processes and functions do you perform to deliver these products and services?

- Process applications, from initial acceptance to clearance;
- Contact jurisdictional agencies, local government, First Nations, other stakeholders;
- Conduct land status via TANTALIS/GATOR, Land Title Office registry and water licenses via Water Licensing Information System (WLIS). Review cadastral information from local government and water license hard copy and digital maps;
- Site inspections;
- Formulate decisions based on information;
- Generate recommendation reports;
- Generate offers and tenures (Lease, licenses, permits, Crown Grants, approvals, PCLs), disallowances, Engineer's Orders, etc;
- Spatial data analysis;
- Creating and maintaining attribute and spatial data;
- Acquiring spatial data (clients, consultants, local government, provincial government, first nations, etc.);
- Generate referrals; seek agency conflicts of interest;
- Respond to other agency referrals;
- Advise clients;
- Maintain Water Rights Information System (WRIS); and
- Provide tenure information, application process information through TANTALIS or hard copy searches of files/ maps.

What information do you collect and manage in carrying out these functions?

- Tenure documents, mapping, survey plans, correspondence with clients and other jurisdictional agencies;
- Water Flow data;
- Tantalis disposition data;
- Reasons for Decision;
- WLIS, WRMS databases;
- Economic Impact data;
- Referral information;
- Digital data (Commercial Recreation CRTIS, Water Works, Points of diversion, Water Reserves and Restrictions, Alpine Ski);

- Survey plans (hard copy);
- Air Photos library (hard copy);
- Ortho-photo library (digital); and
- First Nation potential Aboriginal rights and title information.

What do you acquire from other sources?

- Land Values from BCAA
- Status of stream with regards to licensing.
- First Nation information from Archaeology Branch and from MOF
- Air Photos
- Land Act Survey Plans
- Crown Grant copies
- Digital Base mapping: TRIM, Contours, Orthophotos, Cadastre (Land Act and Land Title Act), compatible projection.
- Other digital resource data (currently available on SRM server)

What registries do you currently use?

- BCONLINE: ALTOS, BCAA, COMPANIES REGISTRY
- CAPAS (private sales data)
- TANTALIS: Disposition Management (Program data) and Registry Management (Parcel data) - historical data and current data.
- WLIS, WRMS (Water License Information System and water rights Information System)
- ORACLE FINANCIALS
- Water APPROVAL database
- SRM Unix server
- CITRIX (CRTIS,GOAT, CRMS, WATROUTE)
- BOULDER REPORTING (ORACLE FINANCIALS data, TANTALIS data)
- SRM's LRMP Map Service (internet)
- CANADA POST, CANADA 411 (internet)

What information is most urgent?

- Land values, land title information; Crown land Registry information.
- First Nations traditional use.
- Current, accessible, clean data is the most important thing. Lots of useless data is still useless data.

What relationships with other organizations do you have in the delivery of your products and services?

- Referrals to federal/provincial agencies and local government, First Nation consultation.
- Inquiries to Land Titles Office/BC Assessment Authority/Ministry of Forests/ Local Government
- Joint advertising with Coast Guard on Aquaculture
- Maintenance of points of diversion coverage in GOAT for Water Licences by MSRM.
- MOUs
- Service Agreements

What is your expectation for how these products and services might be delivered in the future and how the business processes might work?

- Applications could be submitted directly via internet including payment of fees, direct public access to Crown land registry, water license and other tenure information and policy from web;
- ACCURATE! The accuracy, currency and completeness of the data is vital to the decision process. Users need to have a comfort level that the information they are being provided is beneficial; if it is only partial or ridden with errors and omissions then the data will not be useful or utilized;
- Improved service: Service providers will need to be more responsive to the users needs. Past practices of protecting access or delayed delivery will not be workable;
- Streamlined;
- Efficient processes;
- User friendly;
- Faster;
- Standardized within Government: There is a strong need to have all of the data displayed in compatible formats. This is especially true in how the spatial data will be represented. If various formats are not able to properly display the information in correct relationship then it will only add confusion and discontent and the data will not be useful; and
- Support: A support network in place to ensure the data can be answered to if conflicting or incorrect information is detected.

What policy and legislative frameworks are you bound by?

- Land Act;
- Land Title Act;
- Water Act;
- Water Regulation;
- Fish Protection Act;
- Water Protection Act; and
- Lands, Parks and Housing Act;
- Community Charter;

- University Endowment Land Act;
- Condominium Act; and
- (Any act that affects Crown land).

What are your strengths?

- Experienced, knowledgeable and dedicated staff.

What opportunities do you foresee for improved service delivery?

- Public access to web based application process/policy and procedures/ Land/water status and tenure/license information.
- To have all the tools available and the ability to assist our clients in a quick and efficient manner.

What impediments and challenges are you facing?

- Short turn around times, Large volume of applications and Limited staffing resources;
- Public requests for information;
- Poor staff moral with job uncertainty, workplace adjustment and downsizing. Requirements to do more with little and less;
- Increased consultation requirements for aboriginal rights;
- First Nations consultation;
- Outdated computer system;
- Data access tools, such as RAT; and
- Backlogs (water).

How do you perceive the need for an Integrated Registry?

- All land tenuring/water-licensing data and status information should be available electronically. Including interactive mapping;
- Would benefit our business processes; and
- Question if implementation feasible considering data quality issues and lack of data in some areas (Water Rights)?

What documentation can you province that describes your current business process, data and technology environments?

- Most of this information is currently on our Intranet and Internet sites.

Who else should we be talking to?

- Our clients

Land and Water BC (LWBC) – Land Management

Person Interviewed:

- Jim Mattison – Director, Water Management

Date Interviewed:

- June 28,2002

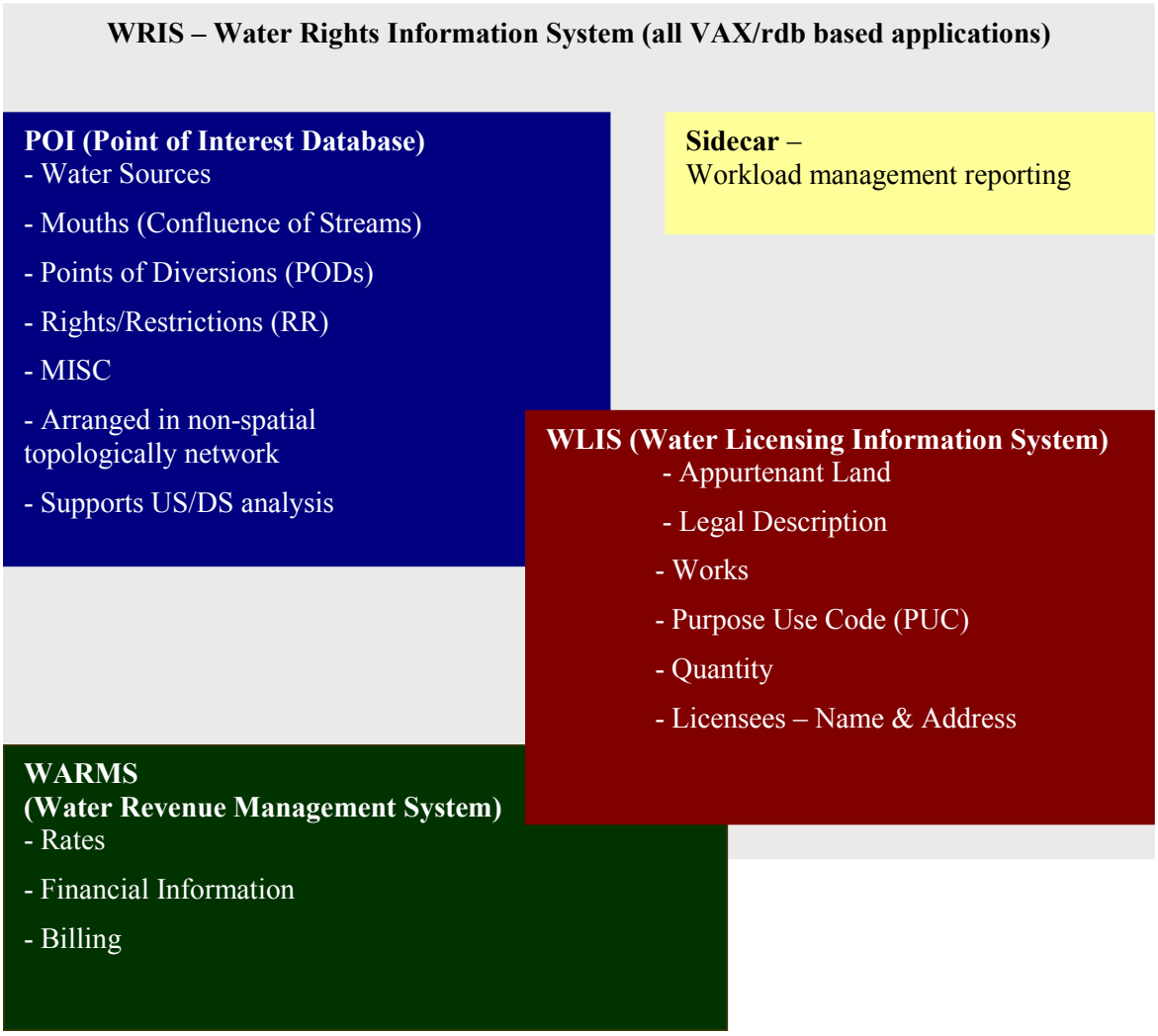
Interviewed by:

- Brendan Feary, (Fujitsu Consulting)
- Vern Danes, (Fujitsu Consulting)

LWBC Integration of Land and Water and status of business

- Applications and issuance of water and Crown lands tenures are performed together most often. Many applications require access to both kinds or resources (e.g. hydro projects, golf courses, ski hills, etc).
- Backlog of W/L application now sitting at 60% of the 2000 that existed when counting started. Plans are to eliminate the backlog by end of fiscal 02/03. Factor contributing to backlog reduction include:
  - Keeping focus on issuing of water licenses and not being distracted by such issues as flood plains or fish habitat
  - Strong focus and commitment to achieving targets at senior levels and throughout the organization
  - Business process improvements including forcing the water process to align more closely with the lands process, using profession discretion and knowledge regarding notification and consultation. (A draft report done by PWC will be available shortly – this is similar to the one they did for the Lands side of the business)
- Number of W/L applications has reduced from high of 900-1100/year during 80s down to 300-450/year currently. The pattern partly reflects cycles in the economy but there is known to be more use of water without a license since it is not strongly enforced. Also, no application is required for domestic use only. In the past, many applications were received for domestic use.
- Backlog of amendments is 2200 – amendments include:
  - Changing works (dams, pipelines, etc.)
  - Changing purpose (different use of the water)
  - Changing apportionment – water rights go with the land and water is apportioned as land is subdivided (water rights require most beneficial use of the water resource)
  - Change of appurtenancy – water rights may move to a new (adjacent or proximal) land parcel

Water Information Systems



- WINS was attempt to spatially enable POI. Involved mapping standards and data conversion GIS tools and GUI. TRIM was used for base mapping but did not show all blue lines to which PODs were attached
- Non-TRIM hydrography layer was created and stored in MELP warehouse
- Technology tools were difficult to support and ARC/INFO had week integration with RDB.
- WINS is no longer used by regional staff. Some office are capturing POD data in GOAT which is accessible from the data warehouse

Expectations for future systems

- Because water information systems are aging and difficult to support, Jim suggests moving to a system that handles both land and water (i.e. Tantalis).
- Sierra has performed a fit/gap analysis of Tantalis and while there is alignment at a high-level, there are obvious differences required in application functionality and database tables and fields at a more detailed level.
- MSRM/LWBC Systems Transition Committee is responsible for deciding the future life for legacy apps and how they should be migrated, replaced, re-developed or eliminated.
- The new watershed atlas may provide the functionality of POI using a GIS enabled topologic stream network.
- An RFP is out to define and confirm requirements for POI.
- A decision is yet to be made as to whether Tantalis will be used (replicated or enhanced) to support water licensing.

Land and Water BC (LWBC) – Land Management

Person Interviewed:

- Wendy Neville, LWBC Kamloops
- Val Lowther, LWBC Surrey
- Sue Bergin, MSRM IMB Victoria
- Linda Norman, MSRM IMB Victoria

Date Interviewed:

- June 28,2002

Interviewed by:

- Brendan Feary, Fujitsu Consulting– by teleconference

LWBC Organization

- LWBC has 4 service centers (Prince George, Kamloops, Surrey and Nanaimo) and 4 field offices (Smithers, Williams Lake, Cranbrook, Fort St John)
- Some portfolio management occurs out of a single office (e.g. all aquaculture tenures are managed out of a single office)

LWBC Systems

- Boulder is replicated copy of Tantalis attribute information to support operational reporting using Oracle Discoverer. Changes are reflected in Boulder on a nightly basis.
- Boulder also interacts with CAS Oracle Financials and downloads nightly key information for financial reporting.
- Operational reports from Boulder include workledger reports, turnaround reports.

Changes Implemented as result of New Era Directions

- Focus on productivity – targeting turnaround times of 140 per application after acceptance to offer for 90% of all new applications;
- Turnaround time is >140 for non-standard applications (e.g. there are 240 independent power producer applications focused in lower mainland that are exceptions to the 140 day turnaround). Other exception include applications that require an environmental assessment;
- Lands application backlog has been eliminated. Water backlog still exists – plan to eliminate this by March 2003 for all applications older than April 1 2001;
- Changes in referral process resulting from MOU with provincial agencies – agencies have 30 days to respond; otherwise no response in interpreted as no concerns. Also, if application is consistent with zoning Official Community Plan (OCP) then no response is received from local government;

- There are tighter controls on pre-applications – LWBC will return incomplete applications within 5 days;
- LWBC expectation (from Joan Hesketh) that all statusing will be done and by SRM by Mar 1 04/05. This is a key driver for integrated registry project. Expectation that SRM will deliver integrated registry data to support automated status. This includes water statusing as well; and
- WINS is no longer functioning. Regions are using different means to update spatial data (e.g. points of diversion, points of use, works, etc.). Some regions are entering this information digitally using GOAT, while others have gone back to manual drafting on hard copy maps.

Requirements

- Strong requirement for private parcel information. Registry information should be integrated including private parcel information;
- Fully automated statusing using data delivered by MSRM (integrated registry). Known grey areas where is expert research is required should be easily identifiable. Grey areas exist on urban fringes where significant private land development exists as well as in known trouble spots like Kootenay railway lots and the E&N land grant on Vancouver Island; and
- Information used to make decisions should be standardized and easy to understand and use.

Data Quality Problems Affecting Land Statusing

- Reversions and acquisitions are incomplete due inconsistency in notification procedures as to when acquisitions are made or when reversions occur;
- No historical shapes – the history of the subdivision of parcels from a primary parcel over time is not captured. This makes it difficult to accurately understand what rights (surface or sub-surface) have been conveyed in particular areas at particular points in time. Parcels showing current in Tantalis (Crown Land Registry) may show as historical in another system (ALTOS) and vice versa;
- Should be processes in place to report and advise about custodial agencies about data errors;
- No comprehensive mapping of all water features – Some streams and watercourses to which water licenses and points of diversion are attached not shown as features on TRIM;
- Missing attribute information for Crown Grants and reversions for surface and under-surface rights;
- No registry record of parcels identified in Plan of Subdivision shown as being returned to Crown. Such parcels include green space (parks), rivers, setbacks, roads, foreshores, etc;
- Missing current and historical band name for Indian Reserves;
- Should have contract to fix the E&N area, parks, forests, etc;
- It's unclear who can tenure land? Who can offer land for tenure or for sale? (e.g. MOT) Legislation is too fragmented and sometimes conflicting in these areas;
- Surveyed transportation – roads, railways, highways;
- ICI doesn't capture remainders, roads or primary parcel boundaries; and
- Potential exists for inconsistency between description of tenure on tenure documents and what is found in Tantalis.

Spatial Updates

- Who is maintaining land claims and settlement areas?
- Spatial extents (shapes) for each application and tenure whether surveyed or unsurveyed.
- RAT is used to capture the application shape. Can be updated at any time but is not updateable when converted to a tenure in good standing.
- All updates are forwarded to Registries department for filing. Complex shapes are flagged for update by registry staff, as opposed to LWBC staff.
- PIN is created at time survey instructions are issued.

Further Documentation

- See Land Management Web Site (http://lwbc.bc.ca/applying_for_land/online_application.htm)

Land and Water BC (LWBC)

Person Interviewed:

- Peter Walters, Land Development & Marketing, Kamloops

Date Interviewed:

- July 2,2002

Interviewed by:

- Brendan Feary, Fujitsu Consulting – by phone

Who are your clients and what products & services to provide?

- Clients are anyone looking to purchase Crown land. General real estate buying public including industry and commercial land developers
- Interested buyers usually represented by realtors
- Products provided are land parcels of Crown land available for purchase

How do clients access your products & services?

- Crown land for sale is listed in the MLS web site. This is the primary point of access.
- Current property listings also available on the LWBC web site and are published in LWBC catalogue

What processes and functions do you perform to deliver these products & services?

- Potential properties for sale are identified, evaluated and developed
- Process for determining whether property can be sold is based on the model used by the land management division and involves and may involve consultation and referral with other agencies, rezoning and having a survey performed.

What information do you collect and manage in carrying out these functions? What do you acquire from other sources? What registries do you currently use? What information is most urgent?

- Response is same as for Land Management Function
- Use ALTOS and BCAA extensively via BC Online.

What relationships with other organizations do you have in the delivery of your products & services?

- Signification relationship with BC Real Estate Association (re use of MLS) and member realtors

What is your expectation for how these products & services might be delivered in the future and how the business processes might work? (e.g. Electronic Service Delivery)

- Current model of listing with the MLS works extremely well and should continue

What policy and legislative frameworks are you bound by?

- Same as land management function

What are your strengths? What opportunities to you foresee for improved service delivery?

What impediments and challenges are you facing?

- Identifying inventory is the most significant challenge (i.e. Where is the potentially marketable and valuable Crown Land?) Current process is not refined. GIS analysis and ICI holds significant promise here.

How do you perceive the need for an Integrated Registry?

- Sympathetic to the need for an integrated registry and the "Jill" concept
- Notes that understanding the distinction between the various land registries is very vague

What documentation can you provide that describes your current business process, data and technology environments?

- Refer to Web Site for overview and further information (http://lwbc.bc.ca/for_business/land_sales_development/index.htm)

Land and Water BC (LWBC) – Water Management

Person Interviewed

- Larry Barr – LWBC Nanaimo (by conference call)
- Glen Davidson – LWBC Victoria
- Maureen Moore – MSRM IMB Victoria
- Linda Thomson– MSRM IMB Victoria

Date Interviewed:

- June 25,2002

Interviewed by:

- Brendan Feary

Who are your clients and what products and services do you provide?

Clients:

- General public (landowners), industry (e.g. licensees), local government, federal and other provincial agencies, First Nations; consulting firms; lawyers; realtors, engineers; foresters; environmental stewardship groups, and
- Portfolio of approximately 42,000 licenses.

Products:

- Land Act tenures over land and foreshore and licenses and approvals for use of surface water;
- Approvals for doing work in and about a stream;
- Orders to amend existing licenses and approvals; and
- Orders in regard to offences.

Services:

- Provide information on Land encumbrances and water licenses;
- Provide information on existing licenses/tenures, fees and client accounts;
- Provide specific information and advice on land/water applications and water license amendment processes; and
- Answer general inquiries on water licensing/approvals and Crown land tenuring and programs.

How do clients access your products and services?

- Letter, telephone, internet, email, in-person over-the-counter in regions, licensing and tenuring process, public access to existing data warehouse via Web query.

What processes and functions do you perform to deliver these products and services?

- Process applications, from initial acceptance to clearance;
- Contact jurisdictional agencies, local government, First Nations, other stakeholders;
- Conduct land status via TANTALIS/GATOR, Land Title Office registry and water licenses via Water Licensing Information System (WLIS);
- Cadastral information from local government and water license hard copy and digital maps;
- Maintain Water Rights Information System (WRIS); and
- Provide tenure information, application process information through TANTALIS or hard copy searches of files/ maps.

What information do you collect and manage in carrying out these functions?

- Information stored on paper maps and files and electronic records and images

Information collected?

- Applicant/client information (application is required to provide a legal description of the land (via BCAA jurol#, Land Titles or Tantalis);
- Points of diversion, points of use and associated works (getting water from point to diversion to where it will be used) This is recorded in POI system – there is and RFP for requirements and analysis to rewrite the POI system. The POI and stream network is key to understanding upstream and downstream impacts when evaluating applications; and
- Rights, responsibilities and restrictions of use (i.e. Terms and Conditions) including amount (i.e. quantity or rate). Rights and restrictions could be periodic or seasonal relative to:
  - Variable resource – inventory changes over time
  - Variable use – multiple use such as power production
  - License is fixed to land for specific use in perpetuity provided there is beneficial use

Information used?

- Tenure documents (to verify tenure to land by applicant), mapping, survey plans, correspondence with clients and other jurisdictional agencies;
- First Nation potential Aboriginal rights and title information;
- Land Values from BCAA;
- Status of stream with regards to licensing;
- First Nation information from Archaeology Branch and from MOF; and
- Water availability studies (e.g. stream flow or climate).

Registries currently used?

- Lands Title Office;
- Crown Land Registry;
- BCAA assessment Rolls and sales data;
- Water Rights Information System;
- Water Information System; and
- Companies Registry (for verification).

Most Urgent information?

- Land values, land title information; Crown land Registry information, and
- First Nations traditional use.

What relationships with other organizations do you have in the delivery of your products and services?

- Referrals to federal/provincial agencies and local government, First Nation consultation;
- Inquiries to Land Titles Office/BC Assessment Authority/Ministry of Forests/ Local Government;
- Joint advertising with Coast Guard on Aquaculture; and
- Maintenance of points of diversion coverage in GOAT for Water Licenses by MSRM.

What is your expectation for how these products and services might be delivered in the future and how the business processes might work?

- Applications could be submitted directly via internet including payment of fees, direct public access to Crown land registry, water license and other tenure information and policy from web;
- Capability of easily determining know who owns what land where; and
- More information is available to the applicant prior to submitting an application – more responsibility is placed on the applicant in the submission and approval process.

What policy and legislative frameworks are you bound by?

- Land Act;
- Land Title Act;
- Water Act;
- Water Regulation;
- Fish Protection Act; and
- Water Protection Act.

What are your strengths?

- Experienced, knowledgeable and dedicated staff.

What opportunities do you foresee for improved service delivery?

- Public access to web based application process/policy and procedures/ Land/water status and tenure/license information.

What impediments and challenges are you facing?

- Short turn around times;
- Large volume of applications;
- Public requests for information;
- Limited staffing resources;
- Increased HQ monitoring of processes and requests for information that is already available electronically;
- Poor staff moral with job uncertainty, workplace adjustment and downsizing. Requirements to do more with little and less;
- Unrealistic public expectations on the services / time available. Increased work loads;
- Increased consultation requirements for aboriginal rights;
- The process for updating spatial information (points of diversion, points of use, etc.) is a regional responsibility and is inconsistent from region to region. Some regions use GOAT and maintain the information electronically, others have gone back to manual drafting techniques (There is an issue paper being drafted on this subject by Linda Thomson);
- Larger scale mapping is required (>1:20K) to capture works show the complete cadastral fabric, administrative areas as well as topographic water features. Many water features from which water is being taken a not large enough to show up on TRIM; and
- Lack of public willingness to provide adequate mapping and information with applications.

How do you perceive the need for an Integrated Registry?

- All land tenuring / water licensing data and status information should be available electronically. Including interactive mapping, and
- Should focus on providing and sharing key information that has been carefully created (i.e. there is confidence in its accuracy and completeness).

Other Information

- The Water Rights Information System (WRIS) has 3 components:
  - POI – Point of Interest system – (going out to RFP)
  - WLIS – Water Licensing Information System (to be replaced)
  - WARMS - (to be replaced)
- Decision regarding redevelopment, replacement of the above systems will be made by the LWBC System Transition Committee.

Other Documentation

- Further documentation available from the water management web site (http://lwbc.bc.ca/water/index.htm)
- Tantalis Fit/Gap Analysis for Water Licenses

BC Assessment Authority (BCAA)

Person Interviewed

- Charles Johnstone – Deputy Assessor (Terrace)

Date Interviewed:

- June 28,2002

Interviewed by:

- Brendan Feary, Fujitsu Consulting (telephone)

Information Needs

- Receive weekly updates from LTO for private ownership data – this is easy;
- The hard part is assessing land and improvements in rural areas and over Crown land for anything less than a fee simple (private) tenure. Information using in assessment process;
- LWBC – information is required on tenure leasing rates in return for assessed value. BCAA has access to Tantalis, LWBC has access to CAPAS. LWBC is major source other than the LTO. BCAA keeps relationship between Lands File # and BCAA roll #;
- Parks – access to information about tenures inside parks – quality is hit and miss;
- Forests – information about roads and permits issued for other purposes such as recreational cabins and logging;
- Knowledge of sub-surface rights is important in NE;
- Federal data – information in areas where saltwater adjoining land or where underwater (saltwater) land is desired. Much of this has now been devolved to local ports and harbour authorities;
- Municipalities – base mapping and zoning – will be handled via ICI. Also new construction, building permits, property approvals and changes. In process of establishing electronic data exchange agreements with local government for sharing of this information;
- Almost all forms of tenure are assessed – few tenures are exempt;
- Archeology, heritage and contaminated sites;
- Electrical inspection and health department records;
- Information required about tenures includes identification of the owner or licensee and their address, rights and restrictions, location and extent, start/end dates if applicable;
- Would like to see and single source for the information that is map driven and field (subject) driven; and
- Suggest that information should also be available to the public.
- Access to tenures from other tenure granting organizations such as rail companies (BC Rail, CN & CP). They own large tracts of land in some communities and issue tenure on that land
- Access to R/W and corridor information over Crown and private land for utilities transmission lines. These effect the value of property positively or negatively

Oil and Gas Commission (OGC)

Person Interviewed

- Scott Wisdahl, Director, Corporate Services Branch

Date Interviewed:

- June 18,2002

Interviewed by:

- Brendan Feary, Vern Danes

Background

- OGC established in 1998 by legislation
- Regulates oil & gas resources and activities province-wide, except for potential off-shore oil and gas development
- Statutory authority for 'upstream' regulation of oil & gas sector (i.e. exploration)
- Headquarters in Fort St. John

Clients

- Approximately 20 major clients;
- Large resource exploration companies such as Talisman Energy, Burlington Resources, Petrocan, etc;
- BC Gas, Centra Gas;
- Local land agents, contractors, land surveyors; and
- Data vendors who access data from OGC.

Responsibilities

- All upstream activities (i.e. extraction from the ground to refining facility);
- Oversees geophysical work, facilities, camps, well sites, pipelines and pre-processing plants (batteries, metering stations, gas plants); and
- Processes land use applications (electronic application submission).

Relationships

- MSRM;
- Access to MSRM data via GIS data warehouse and GOAT (e.g. to access TRIM data);
- Collection of data from wellsites, facilities and other point source data;
- Updates to registry databases (e.g. Tantalis);
- Data exchange agreements with companies to collect and distribute various types of data including production and land activity information;
- LWBC;
- Receives rentals for wellsite tenures;

- Responsibility for long term tenure;
- Assignments and transfers;
- Forest Service;
- Cutting permits and stumpage relative to OG exploration activity;
- Grazing permits;
- Used of forestry roads for access (evidently this is confusing for them);
- Agriculture – Access to ALR interests;
- WLAP – Spills, conservation office data, air quality, waste disposal (safe disposal of water);
- BCAA – Information re improvements to property filed with both OGC and BCAA;
- Regional Districts – pipelines and pipeline Rights-of-Way;
- MEM – petroleum interests; and
- Provincial Revenue – royalties, etc.

Systems

- OGC uses IRIS (Integrated Resource Information System – Oracle based, attribute only, no spatial) and PIMS for all activities including application tracking, wells, pipeline and inspection;
- Some double entry of information in IRIS/Tantalis/FTAS – (e.g. parcel references by legal description);
- Updates are made in Tantalis and FTAS (cutting plans for seismic lines); and
- Faster processing of applications and documents with IRIS and double entry than with using Tantalis.

Requirements

- ICI – important for OGC since much OG exploration activity occurs on private land.
- Continued access to MSRM datasets.
- Reduce work effort around Tantalis and FTAS.
- Reduce conflicting tenure scenarios – this is mainly a political/communication problem, not an information problem.
- Having update access to information.
- Data exchange agreement with GENUS (Canfor). and
- OGC is more of a data provider re OG exploration activity – daily extracts could be taken from OGC system to other regulator or registry system

26. APPENDIX H3

Council of Forest Industries

Person Interviewed

- Anne Mauch

Date Interviewed:

- June 18,2002

Interviewed by:

- Vern Danes

Comments drafted by Dave Sheffield – Weyerhaeuser Canada

- A project like this is certainly overdue. Having the relevant information easily accessible at the outset of any project or proposal that uses or impacts Crown land would be a huge time saver for both the industry applicant and the Crown agencies screening the process. It will also allow better analysis of alternative sites for a project such as a log dump location if the key information on several sites can be analyzed quickly early on in the decision making process.
- A major weakness with the Lands and Water B.C. application process has been the poor quality of their land tenure status maps. Expired tenures are not properly identified and amendments to tenure boundaries are often not up to date. One could be inquiring about log storage opportunities in an area and receive a map showing that the suitable areas are taken when in fact the area is relatively unencumbered. Having to manually work through the status of each area with Lands staff is time consuming if staff time is even available. An integrated land status system would also ensure that the appropriate agencies receive referrals on an application. Too often an agency is missed in the process (which later causes issues or delays) or referrals are send to agencies with no legitimate interest. We can currently assemble information about down stream Water License holders, archaeological sites etc. but it is a multi contact process and the information may not be on a common map base.
- Having information available to all parties should lead to more efficient and transparent land management decisions. Currently applications for Crown land can be turned down for apparently legitimate but sometimes not clearly defined reasons such as First Nations, archeological and fisheries. If all parties have access to the same data, the reasons for decisions being made should be clear to all parties and alternative solutions may become obvious. Lands could even go so far as to have linkage to tenure information including rentals for tenures on Crown land. This could lead to more fairness in the setting of rentals and ensure that Land's policies with respect to sub-tenure charges are being adhered to. (There may be issues surrounding readily available rental information but it can currently be obtained through the Freedom of Information Process). The inclusion of overlays for local zoning and land use plan zones is very useful both for planning and as a check to

ensure that inappropriate zoning is addressed. For example, local government has in some cases made log handling non-conforming in large areas where there is a history of logging activity. Allowing other govt. agencies and stakeholders to see the information properly transposed on a database prior to implementation of zoning changes should prevent such obvious mistakes from being made.

- The recent interest in coal bed methane on lands on eastern Vancouver Island has highlighted the difficulties in sorting out who hold what rights on what lands. There are surface rights, coal rights and the rights to different minerals and hydrocarbons. Presently this is almost impossible to sort out without a huge expenditure of time. In defining certified forest areas, we usually have third party tenures within the forest that need to be excluded from certification agreements. A proper tracking of such tenures on Crown land would be useful in this regard.
- In setting up a new system, it is crucial that the Province work off an accurate cadastral base. Some areas are well mapped, others are not. Without a good map base, we can end up with a sophisticated means to disseminate inaccurate information. The project as proposed would also give us a single contact for such information. We presently have a number of contacts such as B.C. Online, Gator etc.
- Overall the Registry would appear to be a step in the right direction if properly conceived and executed.

Ministry of Water, Land and Air Protection

Person Interviewed

- John Ward

Date Interviewed:

- June 24, 2002

Interviewed by:

- Brendan Feary

Who are your main clients and what are your main business processes and functions that require (or create) registry information?

Note: Registry information is defined as information concerning land-related legal ownership, rights, interested and encumbrances

- Environmental consultants (54%), lawyers (21%), governments (9%) based on a review of one month's transactions (1250 in total). We administer the provincial Contaminated Sites Program and are required under the Waste Management Act to make certain information available to the public on a site registry.

What registry related information do you create? What registry information (or registries) do you use in the course of doing your business?

- Mainly we record legal actions under the contaminated sites provisions of the Waste Management Act. Most of the sites are on private land. The Site Registry is manually linked to the Land Titles registry, from which we download legal land descriptions weekly.

What problems, difficulties or issues do you face with registry information or getting access to it?

- The underlying contaminated sites provisions of the Act are complex, and it takes a while for the new user to understand the regime, and how it works. We have received comments that users find it more difficult to use compared with other registries and not generally valuable, likely because it is a "niche" market. They want it to be more up to date, simpler to use, and enhanced to include maps.

How might an integrated registry better serve your needs or your client's needs? What do you think should be done? What would the key success factors be for your business area?

- Key success factors would be greater user satisfaction with the system. We are awaiting the recommendations of a Minister's Advisory Panel on Contaminated Sites, which may advise on the future of this system.

Are there additional contacts in other agencies we should be talking to?

- BC OnLine. Minister's Advisory Panel after its report is submitted in September.

27. APPENDIX I – PROJECT PLAN

A Microsoft project plan was produced for this project. Due to software limitations it cannot be adequately represented in this document. A copy of the plan is available as a separate product.

28. APPENDIX J – BRITISH COLUMBIA GDP BY SECTOR

Table 11 - Data Source: Labour Force Survey, COPS Statistics Canada

Goods Sector (1999 data)	Employment	% of total employment	GDP ($1992 million)	% of total GDP
Construction	124,700	6.5	5,727	6.2
Logging & forest products	100,900	5.3	5,630	6.1
Non-resource based mfg	83,100	4.4	3,438	3.7
Agriculture, food & beverages	51,500	2.7	2,140	2.3
Mining & mineral products	43,400	2.3	3,751	4.1
Utilities	15,600	0.8	2,358	2.6
Fishing & fish processing	8,400	0.4	315	0.3
Total, goods sector	427,500	22.4	23,359	25.4
Total, service sector	1,478,900	77.6	68,606	74.6
Total, all industries	1,906,400	100.0	91,965	100.0

Services sector (1999 data)	Employment	% of total employment	GDP ($1992 million)	% of total GDP
Retail & wholesale trade	347,900	18.2	11,518	12.5
Health & social services	197,600	10.4	6,284	6.8
Business services	170,000	8.9	5,438	5.9
Accommodation & food	153,900	8.1	3,540	3.8
Other services	152,600	8.0	4,295	4.7
Education	123,900	6.5	5,677	6.2
Finance, insurance, real estate	106,300	5.6	17,881	19.4
Government services	90,900	4.8	5,108	5.6
Transportation & storage	90,100	4.7	5,567	6.1
Communication	45,700	2.4	3,297	3.6
Total, services sector	**1,478,900**	**77.6**	**68,606**	**74.6**
Total, goods sector	427,500	22.4	23,359	25.4
Total, all industries	**1,906,400**	**100.0**	**91,965**	**100.0**

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Oct 31, 2002

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