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Regulatory Certifications/Recommendations for the Investigation and/or Remediation of Contaminated Sites

Environmental Review of External Jurisdictions Engaging Professional Reliance Structured Programs

for

CSAP Society of Contaminated Sites Approved Professionals of British Columbia

September 2015
SLR Project No.: 202.01548.00000

ENVIRONMENTAL REVIEW OF EXTERNAL JURISDICTIONS ENGAGING PROFESSIONAL RELIANCE STRUCTURED PROGRAMS FOR REGULATORY CERTIFICATIONS/RECOMMENDATIONS ON THE INVESTIGATION AND/OR REMEDIATION OF CONTAMINATED SITES

SLR Project No.: 202.01548.00000

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EXECUTIVE SUMMARY

SLR Consulting Canada Ltd. (SLR) was requested by the Contaminated Sites Approved Professional (CSAP) Society to conduct an environmental review of regulatory regimes administering the contaminated sites industry outside of British Columbia. The purpose of the review was to identify known or perceived strengths and weaknesses in terms of timing, cost and effectiveness of the different systems.

The review included the examination of regulatory processes governing the management of contaminated sites for all other Canadian provinces, a representative sample of states in the USA, as well as comparable jurisdictions in the United Kingdom and Australia.

Based on the information gathered from the review, it is evident there are many successful and varied regulatory mechanisms where Professional Reliance (PR) plays a key role in the assessment and remediation of contaminated sites. There appears to be an improvement in the number of sites remediated, compared to jurisdictions with a strict “command-and-control” regulatory regime. The increased efficiency in the site remediation performance of PR-supported frameworks has not coincided with any reported reduction in the standard of public health and safety or environmental protection.

Jurisdictions that have a long history of a PR-supported framework have identified non-technical obstacles to efficient site remediation, such as financial and legal barriers. Features of such PR frameworks that have demonstrated advantages include:

- a comprehensive repository of online information sharing and search tools to aid in maintaining high-quality technical resources for property owners, local governments, contaminated sites practitioners, and PR-qualified members;
- a range of revenue mechanisms to support the establishment of financial incentives that encourage the resale and redevelopment of brownfield sites; and
- legal tools that support the “polluter pay” principle, yet limit future liability for owners and operators, downgradient property owners, tenants, development corporations, and lenders after remediation has been completed or as ongoing remediation measures are maintained.

This Executive Summary is intended to be read together with the remainder of this report and is subject to the same limitations as described in Section 5.0

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1.0 INTRODUCTION

SLR Consulting Canada Ltd. (SLR) was requested by the Contaminated Sites Approved Professional (CSAP) Society to conduct an environmental review of regulatory regimes administering the contaminated sites industry outside of British Columbia. The focus of the review was on those jurisdictions that use a system of licensed, certified or approved professionals to make recommendations or certifications to their respective regulatory agencies for the investigation and/or remediation of contaminated sites. The purpose of the review was to identify known or perceived advantages and disadvantages in terms of timing, cost and effectiveness of the different systems.

1.1 Background

The CSAP Society was formed in 2007, having developed from a recognition of the benefits of an independent body of qualified professionals to assist the BC Ministry of Environment (MOE) in the administration and remediation of contaminated sites in British Columbia. Prior to the formation of the Society, the administration of contaminated sites was carried out exclusively by the BC MOE as implemented through the Contaminated Sites Regulation (CSR) in 1997. A Roster of Approved Professionals was created in 2001 to provide technical review support for the ministry to meet the increasing demand for authorizations required to facilitate development. The need for an independent CSAP Society grew out of BC MOE asking Roster members to take on additional responsibilities. In enlisting further assistance from Roster members, among the key goals of the BC MOE was to improve the timeliness of issuing ministry instruments required by the regulation, while maintaining an appropriate level of technical oversight.

BC MOE is in the process of an omnibus review of British Columbia's site remediation legal regime. This has involved updating and revising all applicable standards where appropriate, as well as numerous technical guidance documents, protocols, and procedures. In coordination with BC MOE's review, this report will assist the CSAP Society in evaluating their processes to increase effectiveness in carrying out their mandate to support the administration of contaminated sites in British Columbia.

1.2 Scope of Work

The review included the examination of regulatory processes governing the management of contaminated sites for all other Canadian provinces, a representative sample of states in the USA, as well as comparable jurisdictions in the United Kingdom and Australia. For each jurisdiction, the review included a quantitative analysis and a high-level qualitative evaluation of

- existing operational framework (enabling legislation and/or regulations, policies, programs, and guidelines);
- past framework(s) and rationale for evolution;
- approval hierarchies;
- professional qualifications and certifications; and
- any innovative program metrics or auditing tools.

1.3 Methodology

Information for this report was gathered from four primary sources:

- a literature review of similar recent summaries of contaminated sites legislation;
- agency websites describing the contaminated sites regulatory regime and approved professional processes involved, if any;
- responses to a questionnaire circulated to contaminated sites practitioners in SLR offices across Canada, the United States, the UK, and Australia; and
- follow-up interviews with select SLR professionals and agency officials involved in the remediation and management of contaminated sites.

A list of the agency websites and persons interviewed is provided in Appendix A. An example of the questionnaire is included in Appendix B. Note that the review information in this report was aggregated and summarized from these sources. At the request of the respondents and interviewees, specific replies to the questionnaire or telephone transcripts are not included in this report.

2.0 QUANTITATIVE ANALYSIS

2.1 Operational Framework

Each jurisdiction reviewed was categorized into one of the following regulatory frameworks. Some jurisdictions employed a combination of two or more of the various framework types or were in a transition phase from one framework type to another. A dominant and/or primary ongoing framework category was selected where more than one was used.

- **DOE: Exclusive Regulatory Decision-Making** – Commonly known as a Command-and-Control approach, it empowers one or more provincial or state authorities such as a Department of Environment (DOE) to compel site owners and responsible parties to investigate and remediate contaminated sites to meet the requirements of a Certificate of Compliance or similar milestone instrument. More than one agency may be involved to share the regulatory workload, with each organization focussing on one component such as leaking underground storage tanks or upstream oil and gas sites, for example. Proponent professionals provide site investigation and clean-up reports for exclusive regulatory review prior to the issuance of ministry instruments or decisions;
- **Ext: Independent Technical Advisory** – Embodied by the External Review (Ext) process more commonly used prior to the formation of the CSAP Society in BC, this framework involves the third party professional review of proponent-initiated applications, on behalf of the regulator. After an application was submitted to the DOE for approval, an Approved Professional would provide recommendations or technical guidance to the regulator's decision- making process, providing additional certainty regarding the costs and timeline associated with the review;
- **PR: Proponent Technical Advisory** – This framework incorporates a Professional Reliance (PR) component that is exemplified by the regulatory process fulfilled by the CSAP Society in BC. Proponent professionals meeting particular qualification and experience requirements directly provide technical guidance and recommendations to the regulator's decision-making process. No further regulatory review is typically conducted before the regulator issues the instrument sought. The qualifications and experience requirements for the approved professional may be set by the regulator, existing professional organizations, an independent professional licensing body, or some

combination of these. Submissions are often subject to a random audit mechanism to maintain quality control and demonstrate regulatory compliance;

- **PR Plus: Independent Surrogate Decision-Making** – This regime also involves Professional Reliance review of proponent- initiated project proposals or applications, on behalf of the regulator, with the reviewer having sole authority and often exclusive liability for the regulatory decision-making process. Similar to the "PR" process, this may be considered a "PR-Plus" approach that affords the qualified professional the ability to issue regulatory instruments directly without ministry review or involvement. The regulator's typical role in this regime is to set the parameters for the third-party review and maintain site registry and associated public information systems. As with the "PR" approach, a random subset of applications is normally subject to an audit process carried out either by the regulator or the licensing body;
- **Goal: Proponent Self-Policing Decision-Making** – In this Goal-oriented framework, proponent professionals ensure that their project meets the regulator's pre-determined guidelines, operational statements, performance standards or output specifications as a surrogate process in place of the regulator's review and decision-making process. There may be more reporting triggers than the "PR Plus" approach, but no direct regulatory oversight unless the pre-determined guidelines or performance standards are breached. The respective professional societies or licensing bodies carry out random audits of the professional work to maintain quality control and demonstrate regulatory compliance; and
- **Other** – This category was established for any other significant use of professional reliance contributing to legislative or regulatory certifications that could not be categorized according the preceding definitions.

Table 1 identifies the Operational Framework for various jurisdictions outside BC, encompassing all Canadian provinces and territories, and a representative list of jurisdictions throughout the United States, United Kingdom, and Australia. The identified list focuses on those that have some form of professional reliance involvement in the regulatory system used to manage contaminated sites. . Additional information in the table is described in subsequent sections.

Note that the majority of provincial and state jurisdictions in the countries reviewed manage their contaminated sites through a DOE (command-and-control) framework. Saskatchewan appears to be the only jurisdiction claiming to have developed a fully results-based regulatory model, relying on PR-qualified members to meet compliance targets established by the province. However, their Code still requires government review and approval of corrective action plans that are considered alternative solutions, where off-migration has occurred and any treatment method other than "dig and dump" is proposed. Ministry reviews are also required if a proponent wants to obtain a Notice of Site Condition (NoSC) for their property, acknowledging that an acceptable level of risk remains at the site. A NoSC does offer a mechanism to limit and transfer liability between property owners, a feature that is not typically present in other Canadian frameworks, but available in several US states. Saskatchewan's Environmental Code came into effect in June 2015, so the outcomes of this approach have yet to be evaluated.

Table 1:
Quantitative Analysis of External Jurisdictions

Jurisdiction	Framework	Previous	Trigger	Hierarchy	Qualifications	Innovative Metrics/Tools
Canada						
British Columbia	PR (2007)	DOE/Ext (1997)	Development	PR ➔DOE	Agrol, Biol, Eng, Geo	On-line application tool; Site Profile Release to aid routine development
Alberta	PR (2008)	DOE (1999)	Spill / Release	PR ➔ DOE	Agrol, Biol, Chem, Eng, For, Geo, Tech	Publicly searchable site registry map and documents; field audit
Manitoba	DOE (2014)	(1997)	Discovery	Proponent ➔ DOE		Action level based on current/future risk
New Brunswick Newfoundland & Labrador Nova Scotia Prince Edward Island	DOE/Ext (2003) (2005) (2013) (2006)	(1997)	Release / Discovery	PR ➔ DOE	Eng, Geo	NB: Mechanism for liability transfer PEI: Publicly searchable site registry
Ontario	PR (2011)	(1996)	Land Use Change	PR ➔ DOE	Agrol, Chem, Eng, Geo, Tech	Publicly searchable Records of Site Condition and supporting documents
Quebec	DOE (2003)	(1998)	Discovery	PR ➔ DOE	Agrol, Biol., Chem, Eng, Geo	
Saskatchewan	Goal* (2015)	DOE (1999)	Release / Discovery	Proponent ➔ PR* *(NoSC ➔ DOE)	Agrol, Eng, Tech	Publicly searchable site registry; Notice of Site Condition (NoSC) releases proponent from future liability
Northwest Territories Nunavut, Yukon	DOE	DOE (1999)	Release / Discovery	PR ➔ DOE		
United States						
California	DOE (2014)	(1980)	Release / Discovery	Proponent ➔ DOE		Publicly searchable site registry map and documents;
Connecticut	Ext (1995)	(1996)	Release / Remediation	Proponent ➔ DOE/PR	Eng	Publicly searchable list of sites; Financial incentives to site clean energy projects at brownfield sites
Massachusetts	PR (1993)	(1983)	Release / Discovery	PR ➔ DOE	Chem, Dip, Eng, Geo, Tech	State-supported insurance, incentives and funding for clean-ups
New Jersey	PR (2009)	(1980)	Release / Discovery	PR ➔ DOE	Biol, Chem, Eng, Geo	Mandatory timeframes established for investigation and clean-up; amendable

Jurisdiction	Framework	Previous	Trigger	Hierarchy	Qualifications	Innovative Metrics/Tools
North Carolina	PR (1997)	(1980)	Release / Discovery	PR → DOE	Agrol, Biol, Chem, Eng, Geo,	Publicly searchable site information maps
Ohio	PR (2014)	(1980)	Release / Discovery	PR → DOE	Biol, Chem, Geo	Provides specialized radiological safety response and field assessment services
Oregon	DOE (2013)	(1980)	Release / Discovery	Proponent → DOE		Publicly searchable site information and associated investigation reports
Pennsylvania	DOE (1995)	(1980)	Spill / Release	Proponent → DOE		Provides grants & low-interest loans to support remediation (innocent acquisitions)
Washington	DOE (1987)	(1980)	Release / Discovery	Proponent → DOE		Publicly searchable site information and associated documents
West Virginia	PR (1997)	(1991)	Release / Discovery	PR → DOE	Agrol, Biol, Chem, Eng, Geo	Publicly searchable site information map
United Kingdom						
England & Wales	DOE (2000)	(1990)	Planning / Inspection	Proponent → Local Authority → DOE	Chem, Eng, Geo, Phys	Capital allowances, tax relief available
Australia						
New South Wales	PR Plus (2013)	(1998)	Land Use Change	Proponent → Local Authority → PR	Registered Professional appointed by DOE	Publicly searchable site information
Northern Territory	PR Plus (2000)	DOE (1994)	Land Use Change	Proponent → Local Authority → PR	Site Auditors accredited in NSW or Victoria	Publicly searchable site information and auditor reports
Queensland	PR Plus (2015)	DOE (1994)	Land Use Change	Proponent → Local Authority → PR	Registered Professional appointed by DOE	
South Australia	PR Plus (2009)	DOE (1993)	Land Use Change	Proponent → Local Authority → PR	Registered Professional appointed by DOE	
Victoria	PR Plus (2012)	(1990)	Land Use Change	Proponent → Local Authority → PR	Registered Professional appointed by DOE	Publicly searchable list of priority sites
Western Australia	PR Plus (2003)	DOE (1993)	Land Use Change	Proponent → Local Authority → PR	Registered Professional appointed by DOE	Publicly searchable site information

2.2 Past Framework(s) and Rationale for Evolution

Where information was available, previous regulatory frameworks were noted along with the year that the current and previous frameworks were implemented. In general, specific contaminated sites legislation began in the United States in 1980 with the federal law (CERCLA[1]) that initiated the Superfund to clean up abandoned and uncontrolled hazardous waste sites. Individual states adopted explicit contaminated sites legislation in the years following. The jurisdiction with the earliest recognition of a professional reliance component of their contaminated sites regulatory system is Massachusetts, which implemented their Licensed Site Professional framework in 1993.

In Canada, all provincial regulatory regimes governing contaminated sites management began as DOE frameworks during the late 1990's. Following BC's change to an Ext process then to the current PR framework, Ontario and now Alberta have adopted a similar PR model. The Atlantic Provinces have also adjusted their regimes to involve an Ext component. Saskatchewan has just recently subsumed this evolutionary trend by adopting a fully results-based Goal-type framework.

In the state of Victoria in Australia, an environmental site auditor system was established in 1990 and a comparable system was adopted by New South Wales in 1998. Other Australian states and territories have since implemented similar site auditor processes to augment their contaminated sites regulatory frameworks, with Queensland making a site auditor component mandatory in 2015.

The rationale for moving from a command-and-control process administered exclusively by a provincial or state regulator to the involvement of a Professional Reliance component have several common themes as espoused by the jurisdictions that have implemented them:

- **reduced or limited regulatory resources** available to complete contaminated site reviews and approvals;
- **reduced duplication of expertise** between the regulator and the private sector;
- **improved certainty of timeframes** to obtain regulatory compliance; and
- **increased flexibility** in the development and implementation of remediation strategies.

Since jurisdictions began regulating the management of contaminated sites, several with DOE-style regimes have increasingly adopted a PR-style framework and at least one (Saskatchewan) has moved directly from a DOE to a Goal-oriented framework. None of the jurisdictions included in our review have changed from a PR framework back to a DOE command-and-control model.

2.3 Approval Hierarchies

Approval hierarchies for the various frameworks begin with one or more of three primary triggers that typically cause a site to come under the purview of the local contaminated sites regulations:

- **a sudden release or spill** of a hazardous waste or substance that may cause soil or groundwater contamination of a site;

[1] Comprehensive Environmental Response, Compensation, and Liability Act

- **discovery** of site contamination either through a due diligence investigation, site development activities, or a public report of an environmental concern; and
- **local authority planning** or a development permit process, which may include routine or targeted inspections of properties hosting potentially contaminating industries or activities.

Following each of these triggers is often a requirement to notify the provincial or state authority, which will often set timelines for action to investigate or address any contamination identified. The notification and approval hierarchies summarized in Table 1 vary depending on whether a PR process is established in the jurisdiction.

- **Proponent ➔ DOE(/PR) –** This process is still the most common hierarchy, where a property owner interacts directly with the regulator to obtain direction and approvals needed to manage contaminated sites. There may or may not be a PR licensing body whose members can be drawn upon as a professional resource to assist proponents and/or review technical information on behalf of the regulator;
- **PR ➔ DOE –** signifies that a Professional Reliance member typically provides the notification documents and supporting information to the Department of Environment, generically referring to the appropriate contaminated sites regulatory authority. The DOE still retains final approval authority for instruments such as “Certificates of Compliance”, “No Further Action” letters, “Notice of Site Condition” or similar that signify a site has been remediated sufficiently to meet an intended land use. However, where a PR process is involved, the level of review typically conducted by the DOE is considerably reduced, unless a quality control audit is carried out; and
- **Proponent ➔ Local Authority/PR –** Some jurisdictions, primarily in the UK and Australia, have designated local planning authorities to be the key regulatory interface for owners of contaminated sites. Regional or state authorities set general guidelines and standards for site investigation and remediation, but the local councils administer how the guidelines and standards are implemented. In Australia, local councils refer all technical reviews to Site Auditors who have final approval authority to issue a certificate when a site meets the conditions necessary for an intended land use.

2.4 Professional Qualifications and Certifications

Jurisdictions with a PR process typically limit eligibility to those with a professional designation in a self-regulated body, such as professional engineering or geoscience. Some jurisdictions (e.g., Massachusetts) allow those with non-university diplomas and other certifications to participate in their PR programs if they have demonstrated additional qualifying work experience. In Table 1, the identified qualifications are abbreviated as:

- Agrol – Professional Agrologist or Soil Scientist;
- Biol – Professional Biologist;
- Chem – Professional Chemist;
- Dip – High School Diploma, with additional work experience;
- Eng – Professional Engineer;
- For – Professional Forester;
- Geo – Professional Geologist, Geoscientist, or Hydrogeologist;
- Phys – Professional Physicist; and
- Tech – Certified Technologist.

2.5 Innovative Metrics and Tools

The typical metrics used to measure and demonstrate the success of the various contaminated sites regulatory frameworks focus on the number of sites cleaned up to meet a particular land use. In the US, identifying and remediating leaking underground storage tanks is a key additional metric of contaminated sites management.

Among the innovative tools becoming more available in several jurisdictions is a publicly searchable database of sites provided at no cost through a government or related agency website. Variations range from a simple, downloadable list of properties in a text or Excel-format file (e.g., Manitoba), to an online map searchable by address that provides links not only to closure certificates but to accompanying environmental investigation reports and other supporting information (e.g., Alberta, California).

Other innovative legislative and management tools include:

- **mechanisms to limit liability** for property owners that complete voluntary clean-ups, as well as transfer liability between owners;
- **title insurance** that can indemnify purchasers against financial loss from unknown or unreported defects in a property; and
- **financial incentives** such as tax relief, low-interest loans, grants and insurance to encourage brownfield remediation.

3.0 QUALITATIVE ANALYSIS

A high level qualitative evaluation of those jurisdictions using a professional reliance structured program was carried out to further assess their advantages or disadvantages in terms of:

- **program funding** – how the regulatory framework is supported, either through government mandate and support, application or hourly fees, or some combination;
- **program transparency** – whether sufficient guidance is provided to assist PR members in the preparation of reports and program instruments, supported by consistent technical decisions where guidance is not initially available, and whether public input is a significant component;
- **regulatory and technical effectiveness** – how well the framework meets the legislative goals and obligations of the regulator, often measured by the level of effort needed to meet the thresholds required for investigations and/or remediation of contaminated sites. For the purpose of this review, we have summarized the number of successful remediations achieving certification compared to the total number of identified sites in the jurisdiction, to give an indication of effectiveness; and
- **timeliness** – the amount of time typically needed to gain a project regulatory approval.

The qualitative analysis was benchmarked against a strictly DOE-style framework, and the results reported as an **Improvement**, **No Change** or a **Regression**. As a priority, benchmarking was completed based on the judgment of the jurisdiction being analyzed; however, in the absence of a jurisdictional opinion, SLR has applied its professional judgment to complete the analysis.

The same jurisdictions with PR-style frameworks as summarized in Table 1 are included in the following Table 2. A representative selection of DOE-managed jurisdictions has also been evaluated, where meaningful program metrics were publically available.

Table 2:
Qualitative Analysis of External Jurisdictions

Jurisdiction (population in millions)	Framework	Funding[2]	Transparency	Effectiveness	Timeframe	Benchmark Comparison
Canada						
British Columbia (4.63)	PR	Application fees $15k-$21k	Technical guidance well-documented, complex; limited public input	1,398 Certificates of estimated 9,000 sites (130 per year)	1 – 3 months	Improvement
Alberta (4.15)	PR	Application fees $1000	Technical guidance available; limited public input	(statistics not available)	2 months – 2+ years, based on complexity	Improvement
Manitoba (1.21)	DOE	File searches $100	Technical guidance available; intending to publish all reports online	2,700 sites identified	< 1 month	N/A
New Brunswick Newfoundland & Labrador Nova Scotia Prince Edward Island (2.32)	DOE (Limited Ext)	Government sponsored	Technical guidance available, harmonized among region	6,700 sites remediated among all Atlantic provinces	Information not available	N/A
Ontario (13.68)	PR	Government sponsored	Technical guidance well-documented, complex; limited public input	1,175 Records of Site Condition	30 days mandated	Improvement
Saskatchewan (1.13)	Goal	Government sponsored	Technical guidance available; limited public input	Information not yet available	Information not yet available	Improvement Anticipated
United States						
California (38.8)	DOE (multiple agencies)	Hourly review fees $5k-$10k	Technical guidance well-documented, complex; significant public input	2,115 No Further Actions of 90,000 sites estimated (125 per year)	Several months typical	N/A
Connecticut (3.6)	Ext	Application fees Up to $3k	Technical guidance well-documented, complex	230 Completions of 17,600 sites estimated	Information not available	No Change

[2] Does not include fees directly charged by PR members when reviewing reports and preparing application documents.

Jurisdiction (population in millions)	Framework	Funding[2]	Transparency	Effectiveness	Timeframe	Benchmark Comparison
Massachusetts (6.75)	PR	Notification and Annual fees Up to $5k per year	Technical guidance well-documented, complex	33,140 clean-ups of 44,000 sites identified (1,500 per year)	Information not available	Improvement
New Jersey (8.94)	PR	Hourly review fees and per APEC >$10k typical	Technical guidance well-documented, complex; significant public input	3,790 clean-ups of 8,500 sites identified	< 30 days	Improvement
North Carolina (9.94)	PR	Application fees $8k to $30k	Technical guidance well-documented	1,800 sites identified; 20,000+ sites estimated	2 months – 2+ years, based on complexity	Improvement
Ohio (11.6)	PR	Application fees $10k to $18k	Technical guidance well-documented	Information not available	Information not available	Information not available
Washington (7.06)	DOE	Wholesale hazardous substance tax, hourly review fees	Technical guidance well-documented but often inconsistently interpreted	200 No Further Action letters of 6,800 identified sites	Timeframes unreliable due to resource limitations	N/A
West Virginia (1.85)	PR	Application fees $5k	Technical guidance well-documented	2850 clean-ups of 3600 identified sites	Information not available	Improvement
United Kingdom						
England & Wales (56.07)	DOE	Hourly review fees	Technical guidance well-documented	150 remediated of 800 identified sites (325,000 potentially)	3 – 6 months	N/A
Australia						
New South Wales (7.57)	PR Plus	Minimal cost recovery	Technical guidance well-documented	40 Site Audit Statements issued for 339 sites identified	< 30 days	Improvement
Northern Territory (0.24)	PR Plus	Minimal cost recovery	Limited technical guidance	154 Site Audit Statements issued	< 30 days	Improvement
Queensland (4.75)	PR Plus	Site Registry Searches	Limited technical guidance	Information not available	< 30 days	Improvement Anticipated
South Australia (1.68)	PR Plus	Site Registry Searches	Technical guidance well-documented	Information not available	< 30 days	Improvement
Victoria (5.89)	PR Plus	Minimal cost recovery	Technical guidance well-documented	777 Certificates issued for 4655 sites identified	< 30 days	Improvement
Western Australia (2.56)	PR Plus	Minimal cost recovery	Technical guidance well-documented	707 Remediations of 20,000 sites identified	< 30 days	Improvement

3.1 Funding

For those PR-supported programs not fully funded through government mandated budgets, application fees are the most common funding source for contaminated sites management frameworks. Such fees are often supplemented by cost recovery based on hourly fees for review services. Not included in Table 2 are review fees directly charged by PR members when reviewing reports and preparing application documents.

Somewhat unique is the funding scheme in Massachusetts, which involves an annual site fee that is charged each year until the site is remediated. In addition to mandated timeframes for clean-up, and based on their reported successful closure rate (ten times the rate in many other jurisdictions), this annual financial penalty appears to help encourage faster remediation in that state.

3.2 Transparency

All jurisdictions reviewed make their guidance documents available on-line, and a considerable amount of guidance information is provided to assist PR-qualified members in completing reports and applications to meet the regulatory requirements. Consistency in interpreting and applying the guidelines to site-specific situations is typically maintained as an unexpected consequence of the limited number of case managers employed by regulatory regimes having a PR-supported framework. Fewer government case managers usually resulted in fewer different interpretations or decisions applying the guidance; therefore, more consistency.

Formalized mechanisms for public input into the remediation process were normally limited to off-migration notification procedures. However, wider public notifications for other types of information, such as selecting a remediation method, were a feature of the New Jersey and California frameworks.

3.3 Regulatory Approval Timeframe

The regulatory approval timeframe summarized in Table 2 refers to the length of time typically required to obtain a closure or final authorization document for a site. While there are often several types of regulatory approvals that may be implemented in a particular framework authorizing such activities as relocating soil or implementing a chosen remedial method, the type of approval that usually draws the most attention is a Certificate of Compliance or its equivalent. Variously known as a Record of Site Condition, Notice of Site Condition, a No Further Action statement, or a Site Audit Statement/Certificate, such a Certificate signifies that a site has been adequately investigated and remediated to meet current environmental standards. The Certificate will often shield the site owner from some measure of future liability and provide a mechanism or baseline for ownership transfer of both the property and any associated environmental liability.

An exception to this rule is the province of Manitoba that, while a DOE framework in its administration of contaminated sites, does not typically issue a closure document or certification for sites. The regulator's role in Manitoba is mainly limited to confirming whether or not a site is considered either "contaminated" (i.e., contaminated at a level that poses a threat to human health or safety or to the environment) or ""impacted" (i.e., contaminated at a level that does not currently pose such a threat, but that may pose such a threat in the future). When a site has been designated either as "contaminated" or "impacted", the regulator requests a Risk

Management Plan for review and approval. While a proponent may request a Certificate of Compliance to confirm that a site has been remediated, there is no requirement to obtain a Certificate. For this reason, Manitoba's approval timeframe in Table 2 represents the typical review period for a Risk Management Plan only.

3.4 Regulatory and Technical Effectiveness

The legislative goals and obligations of a contaminated sites regulatory authority usually involve striking a balance between providing appropriate protection to the public and the natural environment, and establishing consistent, timely processes that enable a thriving economic environment for business to flourish. The technical effectiveness of a contaminated sites management framework also must balance the cost of applying the best available methods to remediate a site using the fastest practical means with the economic capacity of the local real estate market to support development. To evaluate this balance, a somewhat basic but useful indicator of both the regulatory and technical effectiveness of a contaminated sites management program was simplified to the following three metrics, where information was available:

- **Estimated** number of potentially contaminated sites in a jurisdiction;
- **Identified** number of contaminated sites or potentially contaminated sites through the implementation of the regulatory framework; and
- **Remediated** number of sites meeting the environmental and human health standards set by the regulator. A related measure of "efficiency" may be evaluated from the number of sites remediated in a recent year, assuming it is a representative year.

While there is not expected to be a direct correlation between any of these metrics and an overall "efficiency" measure, an assessment of the regulatory and technical effectiveness of each framework may be estimated by the comparing the number of remediated sites to the number of identified sites, and both to the total estimated number of potentially contaminated sites. These totals may also be compared to those of other jurisdictions on an order-of-magnitude basis, factoring in the relative populations. Again, while not representing a direct or equal ratio from one jurisdiction to the next, there is anticipated to be some (if perhaps imprecise) correlation between total population and the history of industrialization, the number of contaminated sites, and the amount of overall technical and financial resources that may be available to support site remediation and development activities.

Considered together with the regulatory approval timeframe, these metrics can be evaluated in a coarse comparison with another jurisdiction to provide a rough illustration of the relative efficiency of the two frameworks. The reviewed information is insufficient to allow for an absolute ranking of the various jurisdictions, as there are multiple socio-economic, historical, political, and technical factors beyond the scope of this review that will have influenced the pace and success rate of any particular framework. Also, not all jurisdictions have published estimates of their identified contaminated sites or remediated sites, and definitions of the metrics used in this review are not consistent among jurisdictions. Different substance concentrations are used to set environmental media thresholds, and acceptable remediation endpoints may also vary from one jurisdiction to the next. However, broad conclusions about relative efficiency may be drawn from comparing the site total metrics and approval timeframes of any two jurisdictions, recognizing that there are several factors not summarized in this review.

Jurisdictions that have "information not available" indicated in Table 2 identify those with limited metrics on their contaminated sites programs apparent at the time of the review. Such data may be available upon further research and direct contact with the pertinent regulatory agency.

3.5 Benchmark Comparison

In all the jurisdictions examined, the frameworks incorporating some form of a PR-supported review process are considered to represent an improvement over strictly DOE "command-and-control" regulatory regimes. If the DOE jurisdictions may be exemplified by the state of California in the US, and the local authority-driven framework of the UK and Wales, the rates of remediation and total numbers of remediated sites in these jurisdictions do not appear to match the orders-of-magnitude differences that might be expected given their much higher populations than the PR-supported jurisdictions.

The Site Auditor process as initiated in Australia is considered to be an evolutionary step beyond the PR framework, as it provides for the PR-qualified member to issue a Site Audit Statement or Certificate directly to a property owner on behalf of the state authority. However, based on the rate of remediation and number of sites identified, there may not be an advantage to this system.

One feature of the Australian PR Plus framework that may explain the apparent difference in efficiency is that Australian Site Auditors must carry personal liability insurance rather than simply be insured through their professional firm or limited company. This requirement has reportedly lead to Auditors being excessively conservative in their directives before agreeing to issue Auditor Statements or Certificates, resulting in increased remediation costs and unnecessary delays before a site receives clearance for redevelopment. Whether this factor has been a significant impediment to the use of more efficient investigation and remediation strategies, in general, may warrant further study.

The province of Saskatchewan, which has recently adopted an Environmental Code as a results-based approach to contaminated sites management, may demonstrate it to be a further evolutionary improvement on the PR model. However, as the Code has come into effect only in June 2015 and still reserves the issuance of a Notice of Site Condition to the regulatory agency, it is premature to assess the efficiency or overall success of this framework.

The state of Massachusetts, which was the first US jurisdiction to implement a PR framework in 1993, may offer some opportunities for learnings to enhance other PR-supported systems. Given their reported track record of having remediated on average 1500 sites per year, some of the unique aspects and emphasis of their contaminated sites management regime may be illustrative, including:

- **Financial Tools** – an annual fee-based revenue source functions as a monetary penalty that encourages site owners to remediate. Funding is then made available for qualifying proponents in the form of grants, low-interest financing, tax credits, and brownfield buying incentives to offset clean-up costs;
- **Legal Tools** – brownfields liability relief is a major component of the Massachusetts brownfield remediation strategy, as it shields eligible owners and operators, downgradient property owners, tenants, development corporations, and lenders from future damage claims after remediation has been achieved; and
- **Technical Tools** –the Massachusetts Department of Environmental Protection (MassDEP) provides a wealth of technical guidance and online sources to aid property owners, municipalities, and PR-qualified members in meeting the department's regulatory requirements. Similar to many other jurisdictions, MassDEP also provides online property search tools at no charge, encouraging a broad sharing of technical information about similar or nearby properties.

4.0 CONCLUSIONS

Based on the information gathered from the reviewed jurisdictions in Canada, the United States, the United Kingdom and Wales, and Australia, there are many successful and varied regulatory mechanisms where Professional Reliance (PR) frameworks play key roles in the assessment and remediation of contaminated sites. Where there is information available regarding the number of contaminated sites and remediated sites in a jurisdiction, there appears to be an improvement in the number of sites remediated, compared to jurisdictions with a strict command-and-control regulatory regime lead by government department reviews exclusively. The increased efficiency in site remediation performance of PR-supported frameworks has not coincided with any reported reduction in the standard of public health and safety or environmental protection.

Other jurisdictions that have a long history of a PR-supported framework have identified non-technical obstacles to efficient site remediation, namely financial and legal barriers. Features of such PR frameworks that have demonstrated advantages include:

- a comprehensive repository of online information sharing and search tools to aid in maintaining high-quality technical resources for property owners, local governments, contaminated sites practitioners and PR-qualified members;
- a range of revenue mechanisms to support the establishment of financial incentives that encourage the resale and redevelopment of brownfield sites; and
- legal tools that support the “polluter pay” principle, yet limit future liability for owners and operators, downgradient property owners, tenants, development corporations, and lenders after remediation has been completed or as ongoing remediation measures are maintained.

5.0 STATEMENT OF LIMITATIONS

This report has been prepared and the work referred to in this report has been undertaken by SLR Consulting (Canada) Ltd. (SLR) for the Contaminated Sites Approved Professional Society of British Columbia, hereafter referred to as the "Client". It is intended for the sole and exclusive use of the Client. The report has been prepared in accordance with the Scope of Work and agreement between SLR and the Client. Other than by the Client and as set out herein, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted unless payment for the work has been made in full and express written permission has been obtained from SLR.

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Brandon, E. 2013. Chapter 9 – Recommended Features of a Model Law on Site Contamination. Global Approaches to Site Contamination Law. DOI 10.1007/978-94-007-5745-5_9. Springer Science+Business Media Dordrecht 2013.

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OCETA. 2007. Jurisdictional Review of Contaminated Site Qualified Professional Programs. Ontario Centre for Environmental Technology Advancement. http://canadianbrownfieldsnetwork.ca/PDF/Jurisdictional_Review_of_Contaminated_Site_QP_Programs_FINAL_REPORT_WITH_APPENDICES.pdf

APPENDIX A
Agency Websites and Project Respondents

Environmental Review of External Jurisdictions
Contaminated Sites Approved Professional Society of BC
SLR Project No.: 202.01548.00000

External Jurisdiction List - Websites & Respondents

Jurisdiction	Regulatory Agency Website	Organization	Contact Name	Phone Number	E-Mail Address
Canada					
Alberta	http://aep.alberta.ca/lands-forests/land-industrial/programs-and-services/reclamation-and-remediation/default.aspx	Alberta Environment & Parks, Reclamation & Remediation	Gordon Dinwoodie	780 427-0600	gordon.dinwoodie@gov.ab.ca
		SLR Edmonton	Jason Pentland	780-490-7893	jpentland@slrconsulting.com
British Columbia	http://www.env.gov.bc.ca/epd/remediation/index.htm	British Columbia Ministry of Environment, Land Remediation	---	---	
Manitoba	http://www.gov.mb.ca/conservation/envprograms/contams/	Manitoba Conservation and Water Stewardship	Raymond Reichelt	(204) 795-9519	raymond.reichelt@gov.mb.ca
		SLR Winnipeg	Robert Hyndman	204-477-1848	rhyndman@slrconsulting.com
New Brunswick	http://www2.gnb.ca/content/gnb/en/departments/elg/environment/content/land_waste.html	New Brunswick Environment & Local Government, Land & Waste	---	---	
Newfoundland & Labrador	http://www.env.gov.nl.ca/env/department/branches/divisions/pollution.html	Newfoundland & Labrador Department of Environment and Conservation, Pollution Prevention Division	---	---	
Northwest Territories	http://www.enr.gov.nt.ca/sites/default/files/guidelines/siteremediation.pdf	SLR Edmonton	Jason Pentland	780-490-7893	jpentland@slrconsulting.com
Nova Scotia	http://www.novascotia.ca/nse/contaminatedsites/	Nova Scotia Environment, Contaminated Sites	---	---	
Nunavut	http://gov.nu.ca/environment/documents/contaminated-site-remediation-property-owners-guide	Nunavut Department of Environment	---	---	
Ontario	http://www.ontario.ca/environment-and-energy/brownfields-redevelopment	SLR Markham	Lisa Tomlinson	(905) 415-7248	ltomlinson@slrconsulting.com
Prince Edward Island	http://www.gov.pe.ca/environment/contaminated-site-management	Prince Edward Island Department of Communities, Land & Environment	---	---	
Quebec	http://www.mddelcc.gouv.qc.ca/sol/inter_en.htm	Quebec Sustainable Development, Environment, and Climate Change	---	---	
Saskatchewan	http://www.environment.gov.sk.ca/Code	SLR Saskatoon	David Black	306-374-6800	dblack@slrconsulting.com
Yukon	http://www.env.gov.yk.ca/air-water-waste/contaminated_sites_regs.php	Environment Yukon	---	---	
United States					
California	https://dtsc.ca.gov/SiteCleanup/index.cfm	California Department of Toxic Substances Control - Berkeley	Karen Toth	(510) 540-3834	Karen.Toth@dtsc.ca.gov
		SLR Oakland	Mohammad Bazargani	510-451-1761	mbazargani@slrconsulting.com
		SLR Portland	Steve Hammer	503-905-2994	shammer@slrconsulting.com
Connecticut	http://www.ct.gov/deep/cwp/view.asp?a=2715&q=324950&deepNav_GID=1626	Connecticut Department of Energy & Environmental Protection	---	---	
Massachusetts	http://www.mass.gov/eea/agencies/massdep/cleanup/	Massachusetts Department of Energy and Environmental Affairs	Kerry Bowie	617-556-1007	kerry.bowie@state.ma.us
New Jersey	http://www.nj.gov/dep/srp/	New Jersey Department of Environmental Protection, Site Remediation Program	Bill Hose	609-777-1044	Bill.Hose@dep.nj.gov
		SLR West Linn	Heather Gosack	503-905-2998	hgosack@slrconsulting.com
North Carolina	http://www.ncbrownfields.org/	North Carolina Division of Waste Management, Brownfields Program	---	---	
Ohio	http://epa.ohio.gov/derr/EnvironmentalResponseandRevitalization.aspx	Ohio Environmental Protection Agency, Division of Environmental Response and Revitalization	---	---	
Oregon	http://www.deq.state.or.us/lq/cu/index.htm	SLR Portland	Steve Hammer	503-905-2994	shammer@slrconsulting.com
Pennsylvania	http://www.portal.state.pa.us/portal/server.pt/community/environmental_cleanup___brownfields/6049	SLR West Linn	Heather Gosack	503-905-2998	hgosack@slrconsulting.com
Washington State	http://www.ecy.wa.gov/programs/tcp/cleanup.html	SLR Bothell	Greg Lish	425-420-9876	glish@slrconsulting.com
		SLR Portland	Steve Hammer	503-905-2994	shammer@slrconsulting.com
West Virginia	http://www.dep.wv.gov/dlr/oer/Pages/default.aspx	West Virginia Department of Environmental Protection, Office of Environmental Remediation	---	---	
United Kingdom					
United Kingdom	https://www.gov.uk/contaminated-land/overview	SLR Leeds	Dyfed Evans	+44-113-258-03650	dyevans@slrconsulting.com
Wales	http://gov.wales/topics/environmentcountryside/epq/contaminatedland/?lang=en	Wales Environment and Countryside, Environment - Protection & Quality, Contaminated Land	---	---	
Australia					
New South Wales	http://www.epa.nsw.gov.au/clm/management.htm	SLR Lane Cove (Sydney)	Colm Molloy	+61 (2) 9428 8100	cmolloy@slrconsulting.com
Northern Territory	http://www.ntepa.nt.gov.au/waste-pollution/compliance/audits/contamination	Northern Territory Environmental Protection Authority	---	---	
Queensland	https://www.qld.gov.au/environment/pollution/management/contaminated-land/	Spring Hill (Brisbane)	Adam Marshall	+61 (7) 3858 4800	amarshall@slrconsulting.com
South Australia	http://epa.sa.gov.au/environmental_info/site_contamination	South Australia Environmental Protection Authority	---	---	
Victoria	http://www.epa.vic.gov.au/your-environment/land-and-groundwater/contaminated-site-management	Environmental Protection Agency Victoria	---	---	
Western Australia	http://www.der.wa.gov.au/your-environment/contaminated-sites	Western Australia Department of Environment Regulation	---	---	

APPENDIX B
Example Questionnaire

Environmental Review of External Jurisdictions
Contaminated Sites Approved Professional Society of BC
SLR Project No.: 202.01548.0000

Environmental Review of External Jurisdictions –
Engaging Professional Reliance Structured Programs For Regulatory Certifications / Recommendations for the Investigation and/or Remediation of Contaminated Sites

Name:
Office:

1. *With which states/territories are you most familiar with the regulatory regimes governing the management of contaminated sites?*

2. *How would you categorize the regulatory regime(s) in the listed states/territories according to the following descriptions? (Pick one for each jurisdiction)*
    a. **Exclusive Regulator Decision-Making.** Proponent professionals provide site investigation and cleanup reports for exclusive regulatory review prior to issuance of ministry instruments or decisions.
    b. **Independent Technical Advisory**. Involves Third Party professional review of proponent initiated site investigations and clean-ups, on behalf of and engaged by the Regulator, providing recommendations or technical guidance to the Regulator's decision-making process.
    c. **Proponent Technical Advisory**. Proponent professionals directly review site investigations and cleanup reports and provide recommendations or technical guidance to the Regulator's decision-making process.
    d. **Independent Surrogate Decision-Making**. Involves Third Party professional review of proponent initiated site investigations and cleanups, on behalf of the Regulator, providing recommendations or technical guidance directly to the project proponent. The Third Party has sole authority for the regulatory decision-making process on behalf of the Regulator.
    e. **Proponent Self-Policing Decision-Making**. Proponent professionals ensure that their project meets the Regulator's pre-determined guidelines, operational statements or performance standards and output specifications as a surrogate process in place of a Regulator review and decision-making process.
    f. **Other**. Any other significant use of professional reliance contributing to legislative or regulatory certifications and/or technical advisory for the investigation or remediation of contaminated sites not encapsulated in the other categories.

3. *Are there plans for the current regulatory regime(s) to adopt or move toward another type of regime from the list above? Which one(s)? How soon?*

4. *How would you characterize the regulatory regime(s) in terms of the following items:*
    a. **Program costs** – are they a significant barrier to site remediation or development?
        i. What are the typical fees to obtain a site cleanup certificate, record of remediation or similar regulatory instrument?

    b. **Program transparency** – are regulatory decisions consistent, with appropriate technical justification?
        i. Is sufficient guidance provided or available to assist investigation/remediation work practitioners in meeting the regulatory requirements?

    c. **Program effectiveness in meeting regulatory objectives** and obligations – are human health and the environment sufficiently protected?
        i. Is there an efficient public input process?
        ii. Are statistics publicly available regarding numbers of successful clean-ups, site notifications, or other metrics? Please provide link.

    d. **Program effectiveness in meeting technical thresholds** for investigations and/or remediation of contaminated sites – can thresholds be satisfactorily met?
        i. Are the thresholds clearly identified and applied?

    e. **Program timeliness** – how long does it take to get regulatory approval of a typical site remediation project?

5. *Please provide the name and contact info (phone, email) of a senior regulator in your jurisdiction who could provide insight into questions #3and #4 above.*

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1185-10201 Southport Rd SW
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Fax: (780) 490-7819

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Fax: (250) 374-8656

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