Rail Transport and the Environment in Canada:

Final Report

Submitted to the
Railway Safety Act
Review Advisory Panel

by
Liane E. Benoit, M.P.A.
Benoit & Associates
819-459-1481

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Executive Summary

Rail Transport and the Environment in Canada:

• The 1999 amendments to the Railway Safety Act (RSA) first introduced environmental protection as an objective of the Act, however its priority relative to the other stated objective of “protection of property” is unclear. Most notable among the amendments is Section 47.1 (2) of the Act which authorizes the Governor in Council to make regulations restricting or otherwise governing the release of pollutants from the operation of railway equipment.

• The framework of environment-related legislation governing the railway industry is shared between Environment Canada and the provincial ministries of the Environment as well as Transport Canada (Dangerous Goods and the RSA). A complete list of relevant environmental legislation can be found in Appendix 1 of the study.

• The railway industry argues that it is “highly regulated on environmental issues”. Most federal and provincial legislation appears to be reasonably harmonized and its application largely coordinated by the various government departments tasked with its administration, however overlaps and gaps do exist, primarily related to proximity issues such as noise, pesticide management, and waste disposal. Both CN and CP cited jurisdictional issues around emergency preparedness and “who is in charge” at spill sites as significant.

• Some disparity exists between corporate and employee perceptions of the effectiveness of environmental management in railway operations. This may in part be explained by railway policy regarding the management of spills that fall below the threshold for reporting. The cost of remediation for oil, fuel and commodity spills below reportable levels of 50 litres or 200kgs represents a disincentive to the proper management of these operational releases. No policy exists on cumulative spills.

• Three case studies of major derailments involving serious environmental impacts were examined. The findings of these investigation are as follows:

  o Lake Wabamun

    ▪ On August 3, 2005, 43 cars derailed just west of Edmonton spilling 700,000 litres of bunker C fuel oil and 70,000 litres of a wood
preservative into the waters of Wabamun Lake, a recreational mecca for
many Edmontonians and home to the Paul Band First Nation.

- Despite the serious implications of the spill, the materials were not
covered under Dangerous Goods legislation. The Transportation Safety
Board had yet to release its findings at the time of writing. Perceived
deficiencies in the level of CN's response resulted in strong public
condemnation of the mitigation efforts and led Alberta's Ministry of
Environment to issue CN with an Environmental Protection Order under
the Environment Protection and Enhancement Act.

- The Government of Alberta struck a Commission to investigate the
incident and make recommendations regarding future emergency
preparedness and environmental protection. Most significant among the
Commission's findings was the absence of a regulatory framework to
govern emergency response to major spills of environmentally hazardous
goods that fall outside the purview of the Transportation of Dangerous

- Cheakamus River

- On August 5, 2005 a CN train derailed in central British Columbia spilling
40,000 liters of sodium hydroxide (commonly known as lye) into the
Cheakamus River. Virtually all of the free-swimming fish in the river,
including multiple age classes of Coho and Chinook salmon, were killed.
- Response to the Cheakamus spill was aided by the existence of a robust
provincial emergency response program based on the Incident
Command System (ICS) model and the fact that the material released
fell under the purview of Dangerous Goods legislation. These
advantages notwithstanding, an initial under-reporting of the significance
of the incident and a delay in the establishment of a joint command
between CN and Ministry of Environment were cited in post-incident
assessments as contributing to a less-than-adequate initial response and
the tendency for authorities to work in silos in the early hours of the
emergency.

- Following three more derailments on that route in the fall of 2005, the
Minister of Transport imposed a Notice and Order on CN limiting the
length of its freight trains running on the northbound Squamish route to
80 cars. A subsequent Order has increased the allowable length of trains
with distributed power to 114 cars (conventional trains remain limited to 80 cars) and imposed several restrictions on rail operations specific to this northbound route. That Order remains in effect.

- In addition to the costs of clean-up and remediation, CN has agreed to contribute $1.5 million to the Pacific Salmon Foundation over five years to support the rehabilitation of the river system. The company is also facing legal action by the Squamish First Nation and five charges have been laid under the federal Fisheries Act and the BC Environmental Management Act. If convicted, CN could face fines for each charge of $300,000 and $1 million respectively.

- Englehart

  - The March 15, 2000 spill occurred when a southbound freight train belonging to the provincially-owned Ontario Northland Transportation Commission (ONTC) derailed 29 cars outside of Temagami, Ontario, releasing approximately 386,000 litres of sulphuric acid, 144,000 litres of which made its way into the Martin Creek waterway.
  - Ministry of Natural Resources (MNR) invoked its emergency plan and in conjunction with the railway, the shipper and local authorities, action was taken to secure the site, notify the community and contain the spill. Efforts to siphon off the acid, dam waterways and absorb the remaining chemical with limestone proved effective resulting in minimal impact on fish and other aquatic organisms.
  - The Transportation Safety Board report credits the Ministry of Natural Resources’ emergency planning, and in particular its practice of conducting regular emergency response training, with the success of this effort. Shared public accountability among all responders may also have contributed to the cooperative, coordinated nature of the emergency response.

- The system that has been established under federal and provincial dangerous goods legislation is generally respected and well understood by the railways. One gap identified in the study dealt with the disposition of dangerous goods during transfers and at sidings. Transport Canada is currently reviewing a Rule on movements submitted at its request by CN and CP; it is anticipated that this Rule will address these concerns.
• There is a significant gap surrounding the transport of environmentally hazardous goods not covered under the Transportation of Dangerous Goods Act. A new regulatory framework would address issues of emergency preparedness, placarding, reporting; expertise and response and mitigation protocols. The issue of “who is in charge” at the site of a spill requires resolution.

• The principle of “polluter pays” is a foundation of all Canadian environmental legislation; railways are therefore liable for the costs of clean-up and remediation of the site of any spill. The Canadian Environmental Protection Act (CEPA) and other environmental legislation also allows for fines of $300,000 to $1 million dollars for every day of an infraction.

• A Memorandum of Understanding (MOU) has been signed by Transport Canada, Environment Canada and the Railway Association of Canada (RAC) that would impose voluntary limits on the emissions of greenhouse gases from railway operations. Higher EPA standards on locomotive designs and refurbishments and the integration of the North American industry ensure some improvements will be realized in Canada in the forthcoming years.

• The issue of spillage of grains and other commodities during rail transport continues to plague the industry and is at odds with both the “green” image it hopes to promote and both corporate and societal standards of good environmental stewardship.

• Transport Canada is currently without the institutional capacity to effectively exercise the RSA mandate regarding environmental protection; further expertise and resources will be required if it is to exercise appropriate oversight in this regard.

• The findings of this study suggest recommendations for action with regard to:
  1. the clarification of the priority of environmental protection versus protection of property in the RSA;
  2. the undertaking of a comprehensive study of the environmental management of railways;
  3. the establishment of a new regulatory framework to govern the transport of environmentally hazardous goods;
  4. the establishment of a Canadian standard for emergency response for rail transport;
  5. improvements to the institutional capacity of Transport Canada with regard to the environmental oversight of railways; and
  6. the obligation for railways to file an environmental management plan and; compliance audit with Transport Canada on an annual basis.
• The greatest achievement the RSA can accomplish is to ensure that trains stay safely on the track; however assuming the inevitability of accidents, it is incumbent upon Transport Canada, as regulator, to ensure safeguards and regulations are in place to deal appropriately with derailments and spills so as to limit the environmental impact of these events. The RSA amendments of 1999 entrenched the principle of environmental protection in the Act; the opportunity to put some substance behind that intent resides with the review process of 2007.

1. Introduction

When Liberal Leader Alexander Mackenzie declared Prime Minister Sir John A. MacDonald’s proposal to construct a railway through several thousand miles of pristine wilderness "an act of insane recklessness" and "one of the most foolish things that could be imagined"\(^1\), it might be safely assumed that not one moment of his outrage was lost on the environmental impact of this ambitious project. And why would it? The "Canada" of the 1870s was one of endless natural abundance and ecological diversity and the political sensibilities of the day more attuned to the exploitation of natural resources rather than their preservation. If "the environment" figured at all in the building of the CPR it was in the role of antagonist – the merciless climate and endless expanse of granite, muskeg, river and mountain that lay between Upper Canada and British Columbia represented a major impediment to both the viability of the railway project and the achievement of its proponents' political and economic ambitions. The "environment" was a thing to be blasted, traversed, tunnelled and ultimately, conquered, a prohibitively costly factor to be overcome and a cursed obstacle to the fulfillment of Sir John A. MacDonald’s "national dream".

Both political and public sensibilities have evolved substantially since the building of the CPR, however where once it was the environment that threatened the viability of railways, today it is the railways that have been found to pose an increasing and reciprocal threat to the environment. Decisions taken by the turn-of-the-century rail engineers who sought the most direct and cost-effective routes in laying track across this country with little regard to ecological considerations have bequeathed a rail bed infrastructure that now commits much of the heaviest and most risk-intensive freight rail traffic to routes traversing areas of the greatest ecological sensitivity. Several recent, high profile derailments have writ large on the consciousness of the nation the consequences to sensitive ecology when derailed and mangled tank cars plunge off the rails, hemorrhaging their toxic effluent into vulnerable waterways. While Canadian railways argue that their safety record is among the best in the industry, it is perhaps the concept of driving heavily loaded freight trains several kilometers in length, their rail cars charged with a cocktail of highly toxic or dangerous goods, through some of the country’s steepest, most isolated, most ecologically vulnerable terrain that now appears to many observers "an act of insane recklessness".

This study will explore some of the environmental issues associated with rail transport. It will analyze the Railway Safety Act in terms of its effectiveness as a legislative mechanism to ensure appropriate compliance with legislative environmental norms and its success in establishing an audit and oversight regime that is sufficiently robust, accountable and transparent to meet the expectations of both Parliament and the Canadian public. Through case studies of several recent train derailments, it will assess the ability of rail corporations and communities to respond appropriately to rail accidents that have imposed significant damage on the environment as well as address a number of the jurisdictional and legislative gaps and overlaps that present challenges to both the public and the railways.

It should be noted that while this study attempts to address many of the most pressing issues related to rail transport and the environment, it is not exhaustive. Given the scope and complexity of the topics which fall underneath the environmental umbrella, the many authorities and jurisdictions involved in its regulation and the time and resources available for research and reporting, certain limitations were by necessity respected. Interviews were held with Canadian National Railways in Montreal and various government and railway officials based in Ottawa; consultations with Canadian Pacific Railways, the Railway Association of Canada (RAC) and industry and government officials in other regions were conducted by telephone or electronic exchange. Time did not allow for travel to the locations of the derailments referenced in the case studies, nor was there the opportunity to meet directly with communities involved with railway issues or undertake any on-site audit of the environmental programs and policies referenced by the railways.

It should also be noted that in the case study of the Lake Wabamun derailment, the Transport Safety Board (TSB) has yet to release its report, leaving the definitive analysis of the cause and response to this derailment unavailable for the purpose of this paper. In the case of both the Lake Wabamun and Cheakamus River derailments, law suits have been launched against CN and in the case of Wabamun, against various departments of the Alberta and federal governments as well; railway and government officials were therefore restricted in their ability to speak on the record, if at all, about these incidents while these challenges remain before the courts.

It is also important to note the reticence of the frontline rail workers contacted for this study to speak freely on issues of safety, derailment or environmental practices in the rail transport industry. Railway employees were very aware that any comments attributed to them that might reflect badly on their employer would be considered grounds for their dismissal under a contract employment provision that refers to “behavior unbecoming an employee”. This threat notwithstanding, some employees did agree to speak candidly on the condition of anonymity and
as a result, portions of the findings must be presented without attribution, a factor which in academic terms might be seen to undermine the credibility of their statements. More importantly perhaps, this fear of reprisal speaks to the level of intimidation felt by some rail employees with regard to safety and environmental reporting and raises seriously questions about what environmental issues are not being fully exposed out of fear of such reprisals.

2. Legislative Framework - The Railway Safety Act

A review of the historic provenance of “the environment” as an area of preoccupation within the context of railway safety and operations would suggest that the relationship between railways and the natural world remained one that was largely undefined in railway legislation for more than a century. The original Railway Act, consistent with the turn of the century preoccupation with the development of a rail system able to respond to the expansionist demands of the Canadian frontier, both economically and territorially, was silent of any suggestion of a need to steward the land, water, or air. Not until the 1999 amendment to the original Railway Safety Act (RSA) of 1989 does the environment emerge as a legitimate area of legislative preoccupation falling within the purview of Transport Canada. At that time, the “Objectives” section of the Act was amended under Section 3 (a) to include among its imperatives the need to “promote and provide for the safety of the public and personnel, and the protection of property and the environment”\(^2\).

The addition of environmental protection to the list of the RSA’s legislated objectives in this 1999 round of amendments was very much in keeping with the emerging expectations of civil society regarding corporate responsibility and ecological stewardship and gave notice to the rail industry that environmental matters had formally arrived on the radar of its regulator. While this revision no doubt reflected the emerging awareness of the need for environmental accountability by all manner of industries whose operations utilize and impact the land and resources held in common by the Canadian people, the addition of “the environment” as an adjunct to the list of previous priorities and in particular, following the obligation of the railways to protect “property”, might prove worthy of further consideration.

The wording of Section 3 (a) of the Act dictates a hierarchy of objectives that places the safety and protection of human life as the first and most critical priority while maintaining the precedence of public safety over that of rail employees. As with ships and airlines, it can be assumed that in the event of an emergency, passengers would be rescued ahead of crew, but that every effort would be made to ensure the well-being of all. The legislation then goes on to mandate the

\(^2\) Railway Safety Act, 1985, C32 (4th supp), Government of Canada, Department of Justice
“protection of property and the environment” together in the same clause as if to suggest that these are also mutually desirable and compatible aims. In practice however, not only are these objectives not always mutually attainable, they can often be in direct conflict (i.e. assuming limited resources at the accident scene, is the operational priority to clear the track and restore rail service or to remove the leaking tank cars at the bottom of the ravine?). The precedence of “property” in the wording of the Act might well be interpreted by the railways as direction in this regard, suggesting that the protection of private or corporate assets (homes, track, commodities, etc.) should take precedence over, be undertaken in lieu of, or even be accomplished at the expense of, the protection of the environment. Even assuming these two elements – property and the environment – were intended by Parliament to carry an equal weight of obligation, the current wording, reflected and equally unweighted in the wording of current railway emergency response plans, is insufficiently clear to ensure the predominance of environmental protection over the protection of private or corporate interests. As such, this ambiguity may appear somewhat out of step with the values of the body politic that this legislation was intended to protect.

A critical examination of how the issue of environmental protection plays out in the substance of the Act offers little that would establish environmental stewardship as a core value of the rail transport industry. “The environment” is referenced in Section 4(1) under the Act’s definition of “threats and immediate threats” which defines a threat as “a hazard or condition that could reasonably be expected to develop into a situation in which a person could be injured or made to be ill or damage could be caused to the environment or property…”3. Interestingly, “environment and property” are juxtaposed in the wording of this clause, confusing rather than clarifying any intended hierarchy of obligation. Further along, the Act ensures compliance with the Navigable Waters Act, indicating that the requirements imposed by the Act “apply in addition to, and not in substitution for, the requirements imposed by or under the Navigable Waters Protection Act.”4.

The next reference to environmental matters comes under the topic of vegetation management whereby Section 24 (1) (e) gives the Governor in Council the right to make regulations regarding:

(i) the removal of anything, including trees or brush, that might be obstructing clear vision either of a road or a line of railway, constitute a threat to safe railway operations

(ii) the removal of weeds

(iii) the use of alternatives to pesticides under subparagraphs (i) and (ii);

3 ibid
4 ibid
While this section might more rightly be seen to authorize the destruction of environment as opposed to its preservation, there is an overriding safety consideration that makes its inclusion entirely appropriate. The addition of (iii) which allows alternatives to pesticide use is nonetheless, from the perspective of environmental impact, a progressive addition, although one which, in the absence of regulation, the railways have yet to willingly embrace.

Further along, the Act addresses the longstanding nuisance issue of noise caused by train whistles in urban communities. The addition of the 1999 amendment concerning “Audible Warnings”, Section 31 (1), gives communities, with proper notice and consultation, the power to pass municipal resolutions restricting the use of whistles and railways the ability to respect these local ordinances. Section 31(2) goes on to quote a number of instances where whistles may be permitted to be used regardless of these resolutions as well as awards the Minister the power to override municipality direction if he or she finds reason to do so. While noise “pollution” may be seen to fall under the general heading of environmental concerns, this clause does not address any of the more esoteric aspects of the impact of noise on nature; rather its intent seems clearly to address the longstanding proximity issue between railways and communities and the conflict that persistently arises between the need to provide adequate warnings at rail crossings to ensure citizens’ safety and the consequence of these blasts on the quality of life of those who live within auditory proximity of the track.

The most legislatively significant and potentially effective aspect of the current Railway Safety Act with regard to environmental management falls under the section on Regulations. Consistent with the intent of the Act as enabling legislation that affords the industry, mainly through the Railway Association of Canada (RAC), the opportunity to draft Rules appropriate to its operations, subject to approval by the Governor in Council, Section 47.1 (2) entitled “regulations – protection of the environment” stipulates that:

“The Governor in Council may make regulations restricting or otherwise governing the release of pollutants into the environment from the operation of railway equipment.”

It should be noted that the term “pollutant” is not defined for the purpose of the Act and therefore gives little indication as to the extent and exact nature of the substances to be considered eligible for regulation.
The lack of definition notwithstanding, this authority does suggest the opportunity for the development of a rigorous regime of railway-specific environmental standards with regard to unauthorized releases and environmental protection. A review of current railway Regulations however indicates a dearth of progress in this regard under the RSA since this authority was granted 1999. How to explain this lack of action given the importance of the “environment” registered in all recent survey assessing the primary concerns of Canadians?

One response might be found in the convoluted governance imposed on all matters environmental in this country. Transport Canada’s core business is transport, not environment. Regulations cost money and resources to develop and once established, more money to monitor compliance and provide effective enforcement. The existence of numerous pieces of environment-related legislation, both federal and provincial, controlling the handling and release of many of the most damaging substances and emissions related to railway operations is generally perceived to be covered off under the mandate of federal and provincial environment departments. Transport Canada’s reluctance to dip its toe into this particular regulatory pond and its ambivalence over its jurisdictional legitimacy in this area is clearly apparent in a document entitled “Railway Safety Program Strategic Overview” written in the wake of the 1999 amendments and currently available on the Transport Canada website. It reads:

“additional effort may be required on environmental issues that have come within the purview of the Railway Safety Act through the recent amendments. The amendments to the Act provide authority to make regulations restricting the release of pollutants from the operation of railway equipment. The approach to be taken on this issue has not yet been determined, but it is expected to involve liaison with Environment Canada.”

While one Memoranda of Understanding (MOU) regarding greenhouse gas emissions has recently been signed under the auspices of the RAC, Environment Canada and Transport Canada, with the intent to move to regulation sometime after 2011, it is evident that the authority granted to Transport Canada to use regulation as an instrument of environmental management has to date been effectively ignored in favour of other less prescriptive, internal or voluntary mechanisms. This suggests a certain tentativeness in dealing with the issue of “environmental pollutants” that seems at odds with the seriousness of environmental damage that has occurred in recent derailments, as well as the persistence of other operational spill issues that have been cited in public complaints and official reports for decades. Clearly, the promise of a

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comprehensive body of environmental regulation specific to rail transport to be developed under the authority granted by the 1999 amendment to the Railway Safety Act has not yet been effectively realized.

3. The Environmental Legislative Framework

The Canadian constitution divides legislative authority for environmental issues between the federal and provincial governments with the provinces taking the lead in regulating many aspects of environmental protection, particularly in the area of water management; the federal government is more appropriately preoccupied with the establishment of national standards and targets, the control of toxic substances, interprovincial matters and international treaties. Section 91 of the Constitution Act outlines the powers of the Government of Canada over environmental issues as:

- Peace, order and good government (Section 91);
- Trade and commerce (Section 91(2));
- Navigation and shipping (Section 91(10));
- Sea coast and inland fisheries (Section 91(12));
- Criminal law (Section 91(27)); and
- Canals, harbours, rivers and lake improvements (Section 108).

The provinces' legislative authorities are listed under section 92 of the Constitution Act. Issues of environmental relevance fall under the following powers:

- Municipal institutions (Section 92(8));
- Local works and undertakings (Section 92(10));
- Property and civil rights (Section 92(13));
- Matters of a "merely local or private nature" (Section 92(16)); and
- Natural resources, forestry and electrical energy (Section 92A and 109).

It is the position of the railway companies that "the Canadian railway industry is highly regulated on environmental issues"\(^6\) as can be evidenced by the extensive list of applicable legislation found in Appendix 1 of this study. Indeed the list of environment-related federal and provincial legislation applicable to rail transport might at first glance suggest a daunting array of overlapping authorities and jurisdictions that would have railways marching simultaneously to the tune of

\(^6\) electronic exchange with Grete Bridgewater, Director, Environmental Management Systems, Canadian Pacific Railways, June 21, 2007
many drummers. In practice however, with some notable exceptions, the legislative regimes under which rail transport falls appear to be reasonably harmonized and/or complementary and their application largely coordinated by the federal and provincial departments tasked with their administration. Fisheries, for example, is one area where dual jurisdiction regularly applies. A spill into a major lake or river will trigger both the federal Fisheries Act, which under Sections 35 and 36 regulates the destruction of fish habitat and the deposit of deleterious substances respectively, and provincial fisheries legislation, which in most provinces (with the exception of Newfoundland and PEI) governs the management of the inland fisheries. Discussion with fisheries officials indicates that their respective purviews are well recognized and acknowledged and that the two levels of government are generally able to cooperate effectively when elements of both Acts are triggered by a rail incident.

Another critical area of overlapping legislation for rail transport has to do with the transportation of dangerous goods where both federal and provincial governments have jurisdiction. In some cases, jurisdictional co-operation is formalized through written agreements (eg, Alberta); in others, tacit understandings (eg, Saskatchewan) define the respective roles played by each level of government and departments are generally able to achieve an effective level of coordination and cooperation. The main area of tension here seems to arise between the railways themselves and provincial authorities. Although railways are obliged by law to report DG spills to the provincial DG authority, that call is often given a lower priority than federal reporting. While the issues that arise around provincial reporting will be explored later in this study, it should be noted that at a federal-provincial level, there seems to be little ambiguity or dissent over respective roles and the two branches of government appear to have achieved an appropriate and constructive working relationship.

The Canadian Environmental Protection Act (CEPA) and the various provincial environment protection acts likewise have significant areas of overlap that could potentially impact on rail transport. While some issues such as greenhouse gas emissions are clearly within the purview of the federal government as they relate to national standards and objectives, in the case of spills, federal officials generally defer to their provincial counterparts. Although both levels of government have the authority to intercede with the spiller, impose orders and levy penalties in the event of a release, past evidence would indicate that it is the provincial Ministries of Environment or Natural Resources that generally take the lead in these matters. Environment Canada confirmed that its role is generally that of providing assistance and/or expertise and unless a situation occurs that extends beyond the legislative capacity of the province, for
example, a spill that represents a contravention of the Migratory Bird Act, orders and penalties are normally levied under provincial law.\textsuperscript{7}

Despite the apparent breadth of the regulatory regime governing environmental aspects of railway operations, there remain, by all accounts, gaps through which the railway companies could easily drive a fair sized locomotive, and if provincial sources are to be believed, occasionally do. The roots of these are historic, jurisdictional and cultural and largely emanate from the fact that Class 1 railway rights of way and yards have historically been, and continue to be, federally regulated lands falling under federal jurisdiction. However unlike the oceans, First Nations reserves, Parks or other federally supervised territories, these railway lands and yards are thinly and sporadically embedded within provincial and municipal territory and represent a ribbon of jurisdictional control literally, in the case of rail beds, a hundred feet wide and several thousand miles long, making ongoing monitoring difficult if not impossible. As previously discussed, environmental matters within provincial boundaries are largely relegated to provincial authorities for the purpose of inspection and regulation. Railways have historically taken the position that despite the geographic proximity of rail and provincial and municipal lands, they are not obligated to respect provincial or municipal legislation or by-laws with respect to rail operations taking place exclusively on railway property. The requirement for compliance with provincial or in very limited cases, municipal regulations occurs only when potential pollutants, such as waste water, used railway ties or herbicides, can reasonably be expected to transgress railway property boundaries onto provincial lands and therefore are legitimately subject to provincial jurisdiction.

While the environmental oversight of railways property, as federal lands, would rightly be seen to default to Environment Canada, here too there exists a degree of jurisdictional ambivalence. Railways are regulated under Transport Canada for the purpose of their day to day operations; Transport Canada, as we have seen in earlier analysis, has created nothing in the way of a regulatory framework for environmental oversight, reporting or accountability, relying instead, on the auspices of Environment Canada or provincial environment authorities to police these matters. All agencies involved appear reluctant to engage in any form of mandate creep, with the result that much of the railways' behavior with regard to environmental protection and compliance appears largely left to the discretion of the railways themselves. While the railways maintain there is liberal authority for environment inspectors at all levels to exercise inspection rights relative to their respective jurisdictions and that such routine oversight is carried out, no railway worker interviewed for this study could ever recall seeing an Environment Canada or Ministry of

\textsuperscript{7} telephone conversation with Tom Foote, Director, Environmental Emergencies, Environment Canada, June 2007.
Environment inspector in the rail yard, although each could cite many reasons that could precipitate such a visit.

It is also important to note that much of the environmental legislation that governs railway activity, inspection or intervention by authorities, whether provincial or federal, is triggered by a reportable incident or a public complaint. While both CN and CP have very prescriptive protocols governing the disclosure of reportable discharges, these protocols appear not to be consistently applied or well understood by their employees. With the exception of matters regarding the transportation of dangerous goods, railway employees denied having received any environmental management education. They reported that not only are fuel and commodity spills or other environmental issues on railway property not regularly reported, employees are actively discouraged from reporting them and in some cases, are threatened with reprisal if they persist in their complaints to management.

These testimonials of environmental negligence appear completely at odds with the evidence presented by CN and CP railways, who confirmed they undertake annual compliance audits with regard to all applicable environmental legislation and that inspectors are regularly welcomed to their premises. Unfortunately, the compliance audits to which they refer are internal company documents and there is no requirement for the corporations to file them with any regulatory agency; hence it is difficult to assess the robustness of this program or indeed how successful the railways are in achieving compliance. Nor does this practice suggest any degree of oversight, transparency or accountability on the part of Transport Canada with regard to this aspect of rail operations.

Why the disparity between management’s perception of the railways’ environmental practices and that of their employees? One possible explanation might be found in an examination of the companies’ list of reportable incidents (for an example, please see CP Rail’s guidelines for the reporting of spills in Appendix 2.) The reports of environmental negligence referred to by rail

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8 based on several conversation with current and retired railway employees, June, 2007
9 telephone conversation with a CN rail yard employee 1 – anonymity requested
10 Electronic communication with Grete Bridgewater, Director, Environmental Management Systems, Canadian Pacific Railways, June 9, 2007
11 Canadian Pacific Railway Company Environmental Policies and Procedures, Environmental Incident Reporting, April 1998, Revised June 2006 Note: CN’s policy reflects similar levels for reportable incidents.
employees were largely related to incidental spills of waste oil, fuel or commodities that occur within the day to day operations of the rail yard and are confined to railway property. A quick reference to the reportable spills tables of the railway companies (Appendix 2) would indicate that a diesel or waste oil spill of less than 50 litres, although a significant spill by any environmental standard, is not considered a reportable release according to CN and CP rail company policy as long as that spill occurs within the confines of railway property. It would no doubt take a very astute assessment of a casual oil or fuel spill to determine whether the actual amount spilled breached the 50 litre standard. It should be noted that the reportable spills policies of both Class I freight companies are completely silent on the issue of on-going, repeat or cumulative spills; the amounts referenced in the reportable incidents tables are not cumulative and therefore the incidence of ongoing operational spillage is allowed to persist. The incremental environmental impact of these spills however is significant. In one instance where a rail yard was sold, prompting an obligatory environmental assessment, fuel and oil were found to have saturated the rail yard premises to a depth of 20 feet.¹²

"when we are working with the old locomotives, there is fuel everywhere and the engines are always leaking oil everywhere. We call them "pollution tanks"...water displaces the oil and they drip into these pans...there are suppose to be catch tanks to pump them out but there is nobody left to work them so the engines are always leaking oil...if a guy reports a casual oil leak, nothing happens. There's a real reluctance to take a locomotive out of service and in order to clean out the drip pans, it would take 3 or 4 days and you would have to move it elsewhere...."¹³

The issue of cumulative on-site rail yard spillage is apparently not restricted to fuel and oil. One employee related how he constantly had to work around piles of spilled commodities such as lead, zinc and sulphur concentrates and said the presence of this spilled material was a "thorn in the side".¹⁴ He went on to describe how even the spilling of something as innocuous as chipped wood can present an environmental hazard. According to this worker, rail cars are often haphazardly loaded with wood chip material blown into the rail car through a large hose placed in an open hatch at the top of the car. He reported that no apparent effort is made by either the shipper or the railway to ensure that this material is contained during loading or that the hatches are properly secured after the car is filled. The result is that between the load out yard and the rail yard, overflowed or escaping chipped wood material falls off the cars and piles up around the

¹² Telephone conversation with rail yard employee, June, 2007
¹³ Ibid
¹⁴ Ibid
tracks. If this material gets wet, the fibre dries to the consistency of peat. This railwayman recounted an incident where a large pile of this dried material caught fire from sparks flying from the wheel of the train, resulting in a blaze that took two days to extinguish. He went on to comment on how this material also fouls up the ballast and degrades the ballast structure, created a real safety hazard. Again, a reference to the table of reportable releases indicates that 200 kilograms of this, or any other non-dangerous good material would have to be spilled before it would become a reportable incident and no reference is made in the Table to the management of accumulated spills.\(^\text{15}\)

There is no question that the railway business can be dirty work. When taken in isolation, each spill may indeed not represent a significant environmental hazard; however the rail companies' apparent tolerance for the persistence of the practices described above raises serious questions about their attitude to both employee safety and the cumulative environmental impact of their own industrial activities. The imperative to keep the locomotives moving regardless of leakage, the willingness of at least one company to downsize operations to the point where such ongoing spills are no longer able to be responsibly handled, as well as the apparent intolerance of employee complaints with regard to these incidents suggests that the rail companies have yet to internalize the values of progressive environmental management and will only pursue responsible practices insofar as they are legally required, strictly monitored or in their own financial interest.

4. Legislative Overlap or Gaps – the Railways' Perspective

Are there areas in which the railway companies would welcome intervention, guidance or regulation under the RSA's authority? This question was posed to both CN and CP and both companies identified areas where the current legislative framework has presented real operational challenges. A selected list of those identified by the railways is as follows:

i. Noise

While guidelines based on American EPA standards for noise have been adopted by the RAC, there is no legislation or regulation dealing with noise levels related to railway operations. Canadian Pacific would like to see the establishment of a regulation that would harmonize Canadian standards with existing US EPA regulations governing railroad noise (40 CFR 201 Noise Emission Standards, 49 CFR 210 Noise Emission Regulations). Grete Bridgewater of CP states that railway equipment, including locomotives, purchased and operated by Canadian

\(^\text{15}\) See Reportable Spills Table, Appendix 2 - Environment Response and Communication Plan, CP Rail, July 1994, revised 2004
railways are manufactured to these standards. The advantage to the railway company of the adoption of these standards would be the establishment of a universal standard of noise measurement, ideally, 100 feet off the centre line of the track, which is the geographic area over which railway companies have control. Ms Bridgewater makes the point that the noise standards referenced by communities are often calibrated at various receptors such as residences, hospitals, and schools. Not only does this lead to arbitrary analysis and inconsistencies in noise evaluation, but the railways argue they have no control over the development and location of these facilities or neighbourhoods.¹⁶

It is apparent from the public submissions received by the RSA Review that noise and vibration are among the most persistent and troubling proximity issues befuddling both communities and the rail industry at present. While constructive efforts to address these issues have been initiated under the auspices of the Federation of Canadian Municipalities' (FCM) and the RAC's Community-Rail Proximity Initiative and Steering Committee created in 2003, the establishment of specific standards and measurement criteria might well serve both parties to these disputes. As many of the submissions from private citizens to the RSA Review can attest, the railways are not completely innocent of imposing unacceptable levels of noise and inconvenience upon their immediate neighbours. On the other hand, it is hard not to sympathize with the railways in those situations where an absence of appropriate municipal by-laws or provincial planning regulations have allowed developers to build housing subdivisions or other facilities too close to railway tracks or operations, leaving the railways and disgruntled residents to resolve the inevitable complaints that arise once occupancy has been established.

ii. Pesticide Management

While the RSA authorizes the removal of vegetation and trees from rail rights-of-way as a rail safety precaution, the legislation is not prescriptive in defining the how railways are to accomplish this requirement except to authorize the use of alternate means to spraying. The use of chemical herbicides represents the least expensive and most expeditious way to eliminate vegetation and is unquestionably the approach preferred by the industry. Despite the undisputed legality of the use of these federally approved chemicals, there has been and continues to be public resistance to the spraying of rail lines, particularly in municipal corridors. Over the course of the past decades, public sensibilities have been awakened to the potential impact of these chemicals on

¹⁶ Based on electronic communication with Grete Bridgewater, Director, Environmental Affairs, Canadian Pacific Railways, June 9, 2007
both ecology and human health and over 250 municipalities have passed by-laws limiting or eliminating the cosmetic use of pesticides within their boundaries.

The issue of pesticide use is perhaps one of the more acrimonious, polarized and controversial environmental issues reverberating within town halls today. The lawn care industry and chemical companies have rallied an aggressive lobby armed with industry studies attesting to the benign nature of these products; concerned citizens are just as adamantly opposed to the application of these chemicals and are likewise armed with scientific evidence of the risks associated with human exposure. Although the railways' need to clear vegetation from track to ensure proper inspection and rail safety is fully recognized, municipalities have in many cases asked that their pesticide bans be respected and that railways employ alternative means to clear track within their communities.

These communities are not without legitimate concerns. More than 550 chemicals are found in the more than 7000 pesticide products used in Canada and regulated under the Pest Control Products Act. Of these, 401 were registered prior to 1995, many in the 1940’s and 50’s before toxicology reports were required as a condition of registration. Recognizing the significant health and environmental risks this former omission might now represent, the federal government has undertaken to re-evaluate all pesticide chemicals registered prior to January 1, 1995 by the year 2009 with the eight most common lawn and turf pesticides being assessed as an immediate priority. Of the four re-evaluations that have been completed to date (chlorpyrifos, diazuron, malathion, and carbaryl), all have been found to breach acceptable health and environmental standards and consequently are being phased out of use in Canada. Reviews of the other priority chemicals have yet to be completed.

Medical evidence also seems to substantiate the dangers of pesticide exposure. In 2004, the Ontario College of Family Physicians published a comprehensive review of research on the effects of pesticides on human health. Their survey showed consistent links to serious illnesses such as cancer, reproductive problems and neurological diseases, with children found to be especially vulnerable to the impact of these chemicals. Dr. Margaret Sanborn of McMaster University, one of the review's authors, warned that "Many of the health problems linked with pesticide use are serious and difficult to treat ... we are advocating reducing exposure to pesticides and prevention of harm as the best approach." 17

17 Ontario College of Family Physicians, “Comprehensive Review of Pesticide Research Confirms Dangers - Family doctors highlight link between pesticide exposure and serious illnesses and disease; children particularly vulnerable.” April 23, 2004
Although railways have made some concessions to these communities' concerns, the impression given by both CN and CP is that these concessions have not been granted willingly and that the "precautionary principle"\textsuperscript{18} that governs much of environmental stewardship policy has yet to be recognized within the railway industry. Indeed, environmental management officials for both railways appeared proud of the strategies they had employed to discredit citizens concerned with pesticide use during recent BC hearings on pesticide licensing and regulation, indicating their allegiance is strictly on the side of the pesticide industry. As with most railway operations, bottom line considerations appear to be the driver.

At present, railways must apply for permits from each province to undertake spraying, an exercise that has resulted in a patchwork of regulatory requirements. Rules governing the application of pesticides are not consistent from province to province, with regions such as British Columbia imposing much stricter regulations than, for example, Saskatchewan. The railways would welcome federal regulation that would standardize the rules governing the application of pesticides and eliminate the requirement for provincial permits. It is also apparent that the environmental affairs departments of both these class 1 railways would lobby hard to ensure that these rules reflected the least restrictive of the provincial standards.

iii. Site Remediation

Although provincial governments generally have jurisdiction over the cleanup of contaminated sites, CN reports there can be conflict between provincial authorities and Transport Canada on this issue. The company offered the following incident by way of evidence: a cleanup plan presented by CN for a derailment site on the Allanwater Subdivision was approved by the province of Ontario, allowing the company to collect and stockpile contaminated soil and then cover the stockpile with tarpaulins. The contaminated soil was to be removed after the track was restored to service and CN had cleared its backlog of trains. A Transport Canada (TC) officer, who according to CN had an axe to grind with the company, insisted that the stockpile be removed as soon as the track was rebuilt and before the backlog of trains was cleared. The TC officer went on to specify how the contaminated soil was to be cleaned up and where the stockpile was to be placed. CN felt that TC's cleanup methodology made for extra work and additional time was required to do it. In the opinion of CN, the TC approach was no better than

\textsuperscript{18} the precautionary principle is a moral and political principle which states that if an action or policy might cause severe or irreversible harm to the public, in the absence of a scientific consensus that harm would not ensue, the burden of proof falls on those who would advocate taking the action.
the plan submitted to the Ontario Ministry of the Environment's (MOE), was unnecessarily onerous for CN, and did nothing to enhance environmental protection. The MOE's Regional Director in Thunder Bay deferred to TC's requirements rather than engage in a dispute over jurisdiction. According to CN, TC did not consult with Environment Canada regarding the environmental cleanup conditions it imposed on CN.

iv. Emergency Preparedness and Response

Both CN and CP indicated that there were jurisdictional issues around emergency preparedness and response although neither company gave specific examples as to the exact nature of these issues. CN wrote that "spill response is the only major one (issue) where differing views of 'who's in charge' is quite common."19 CP had the following comments and recommendations:

Capacity and consistency in emergency response within the railway industry may benefit from developing a railway emergency response plan template based on the Canadian standard CSA Z731-03. The RAC Environment Committee could serve as an appropriate mechanism to achieve engagement and consensus by the railways. This standard is based on the concept of incident command, notification and coordination of all stakeholders, identification of roles and responsibilities and designation of lines of communication.

Given the diversity of regulatory requirements and authorities, coordination, cooperation and communication are essential to effectively manage complex incidents.20

The RSA Review Panel might well take note of CP's recommendation. As the case studies following will illustrate, emergency response to major spills has yet to achieve the level of consistent effectiveness and timeliness that the Canadian public would expect in the face of such disasters. While the issue of multiple jurisdictions and authorities is definitely a factor at any spill site, the perennial cry of "who's in charge" represents the more persistent conundrum and has yet to be sufficiently examined in the context of environmental hazardous spills.

The Canadian Standards Association (CSA) Z731-03 emergency response standard has been established to inform businesses and public organizations on planning, administration, training, resource utilization, auditing, and other aspects of emergency preparedness and response. The CSA standard is designed to establish minimum criteria for the effective response to emergency situations and as such, may not be sufficiently robust to address all of the operational and

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19 electronic communication with Normand Pellerin, Assistant Vice-President, Environment, Canadian National, June 26, 2007
20 electronic communication from Grete Bridgewater, CP, June 21, 2007
jurisdictional challenges posed by a major derailment and spill. The standard may nonetheless offer a basic program against which the railway industry might assess the adequacy of its current emergency response protocols and upon which a more rail-appropriate program might be developed. Ensuing from these discussions, Transport Canada might wish to consider the development of its own standards for emergency environmental response to ensure that a consistent level of preparedness and response capacity is achieved by all railways.

5. Off the Rails: An examination of Case Studies of Rail Disaster and Response

i. Lake Wabamun Derailment and Spill

In the early morning of August 3rd, 2005, 43 cars of a western-bound freight train derailed just west of Edmonton Alberta, spilling 700,000 litres of bunker C fuel oil and 70,000 litres of a wood pole preservative into the waters of Wabamun Lake. Two years after the incident, the Transportation Safety Board has yet to release its report on this incident. Reports at the time and accounts by the company regarding the appropriateness and nature of CN's response vary widely but there can be no question as to the critical tenor of the public's response to this spill. Whether the negative reaction was the result of ham-fisted communications or a legitimate response to corporate disregard for human health and environmental protection, the handling of that combined spill will likely live in the annals of railway history as the figurative poster child for emergency response gone wrong.

Several factors have been identified as befuddling the emergency response efforts undertaken by CN. Weather was a factor. High winds propelled the oozing mass of viscous bunker C and treatment oils across the lake, making containment difficult. Perhaps more significantly, the oils involved in the release, while environmentally hazardous, were not technically "dangerous goods" and therefore the prescriptive protocol of reporting and oversight imposed under the Transportation of Dangerous Goods Act (TDGA) was not triggered as might be expected in an incident of this magnitude. To further complicate matters, CN did not have readily available the skirted booms required to contain this type of oil and proper equipment had to be sourced outside the province, resulting in a delay of several days. Lastly, the province of Alberta lacked a coordinated emergency response system sufficiently robust to enable responders to react nimbly to an event of this magnitude. The result was a less than seamless response by CN and the respective federal, provincial and municipal officials as jurisdictional issues erupted in those first critical hours over who was in charge, what should be done and who, when and what should be told to the public.
Had Lake Wabamun not been a popular recreational mecca for vacationing and retired Edmontonians or home to a community of First Nations people with strong ties to its lands and waters, the problems that arose in the response to this incident might not have made national headlines, but such was not the case. A legitimately outraged and politically astute public stood in horror as media reports showed CN industriously repairing the track to get their rail line back in service while the crumpled, discarded tank cars lay submerged in the lake oozing their toxic sludge with little obvious effort being made at mitigation. This apparently blatant exercise of corporate interest over public welfare left no room for imaginary thought in the minds of many observers. Two days after the spill, with Lake Wabamun residents barricading the tracks in protest over this apparent misfire of operational priorities, the Alberta Ministry of the Environment issued an Environmental Protection Order to CN under the Environment Protection and Enhancement Act (EPEA) directing them to undertake immediate and appropriate action to address the environmental impact of the spill. That Order was expanded seven days later to further define the actions and deadlines required of CN with regard to remediation, monitoring and communications.

As previously mentioned, few of the key parties involved in this event were able to comment publicly while the lawsuits filed against CN and various government agencies remain pending before the courts. However in reviewing the accounts available, it becomes quickly apparent that much of the public backlash arose as a result of issues of reporting and communications. Call outs to respective agencies were slow to be implemented; CN’s first press release to the community was not issued until two days after the incident; details of the exact nature of the spill were inaccurate with the result that residents only learned several days after the spill that the pole preservative that they had been industriously wiping off fouled birds, waterfronts and rocks contained a substance that was a known carcinogen. The Paul First Nation was not informed of the spill until 10 hours after it occurred and a mere ½ hour before the oil started to appear on the shoreline of their community. Problems that CN encountered in accessing the necessary equipment to contain the spill were not communicated to the communities affected, creating the perception, rightly or wrongly, that CN did not care about the impact of the pollution on these residents or the ecology.

Whether this event represented a grossly negligent effort on the part of CN to rally an appropriate response to a major derailment or was simply the result of the corporation’s ineptitude in managing the communications around a complicated and challenging clean-up effort will be up to the TSB and several federal and provincial courts to decide, however it appears abundantly clear that from a public relations perspective, the handling of this event was catastrophic. As one critic
observed, virtually every effort made by CN to placate the public was a case of too little, too late.

James Hoggan writes:

On Aug. 13, 2005, Canadian National Railway Company president and CEO Hunter Harrison issued a letter of apology for the Lake Wabamun derailment and oil spill, a letter that was, by almost every public relations measure, excellent in content and tone. It was contrite, sincere and unequivocal. It had detailed information on CN’s plans to clean up the spill and to make reparations in the community. It had a full selection of contact numbers and websites where members of the public could lodge complaints or get more information.

It was also past useless. By the time CN issued the letter, 10 long days after the worst Canadian oil spill in 35 years, the company had completely spent its credibility. Harrison’s words read like a grudging apology extracted from a remorseless child. Much too little; way too late.

The primary lesson is that nothing ever begins as a “public relations crisis.” The Wabamun derailment was an operational and environmental crisis. But because the public was affected, the company also should have followed the three key rules that apply in such cases:

1. Do the right thing
2. Be seen to be doing the right thing.
3. Don’t get #1 and #2 mixed up.

In response to the Wabamun derailment, the Province of Alberta struck a Commission to investigate the incident and develop recommendations to ensure that future emergencies, should they occur, would result in more satisfactory and less acrimonious outcomes. The Commission’s findings, while specific to Alberta, are nonetheless instructive for the purpose of this study and many of their recommendations would find equal resonance in other provinces.

The report clearly states the province’s obligation to ensure its citizens are protected by a world class emergency management system. While many components of such a system already existed in Alberta at the time of the Lake Wabamun derailment, including a provincial public warning system, an amalgamated emergency call centre, first responder training facilities, an Emergency Management Alberta organization and a network of highly specialized private sector emergency response experts, problems with coordination and implementation still remained. Among the principle issues identified was the existence of different response protocols among various departments and authorities that didn’t mesh well in the face of a real emergency. Also noted by the Commission was a need for all responders to develop an emergency response culture that consistently anticipates and reacts to a worst case scenario when advised of derailments and other emergencies and that responds accordingly. The report states, “This

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21 James Hoggan, “What CN Should Have Done”, Alberta Venture, Volume 9, Issue 8, October 2005, pg. 1
22 Ibid, pg. 12
culture of over-responding recognizes that it is easy to scale back but almost impossible to regain ground lost to an initially inadequate response."\textsuperscript{23}

The challenge of ensuring that the needs of First Nations communities are met was also noted by the Commission, as was the requirement to include representatives from native communities in the decision-making process. The Paul Band, having been largely ignored at the outset of the incident and subsequently incensed by the handling of the clean-up, has launched a multi-million dollar law suit against CN, the federal Government and the Province of Alberta over the management and consequences of this derailment.

Perhaps the most significant gap in emergency preparedness identified through this incident is the lack of a regulatory regime governing spills that fall outside the purview of TDG legislation but nonetheless have the capacity to inflict severe damage upon the environment and/or human health. There was no requirement for CN to have in place an Emergency Response Assistance Plan (ERAP) that would have provided, among other things, immediate information on the properties of the spilled materials, nor were the TDG reporting and response protocols triggered in this case, despite the nature, impact and magnitude of this spill. The Commission was quick to note:

\begin{quote}
"The Dangerous Goods Incident Support Plan was never triggered for the spill at Lake Wabamun because it didn’t involve products regulated as dangerous goods. This contributed to a situation where resources weren’t activated."\textsuperscript{24}
\end{quote}

While CN does have a generic emergency response plan in place to deal with derailments and spills, that plan was insufficiently robust to effectively manage and mitigate the significant environmental impacts of an oil spill in this region. Among its recommendations, the Alberta Commission called for:

\begin{quote}
"Provincial and federal governments...to quickly and cooperatively work on a regulatory framework that ensures adequate information is available to responders when an incident occurs. All the necessary information and data must be readily available to the responding agencies, no matter where the incident occurs..."\textsuperscript{25}
\end{quote}

\textsuperscript{23} Ibid, pg 15
\textsuperscript{24} Government of Alberta, Environmental Protection Commission, “Learning the Lessons and Building Change”, pg. 11
\textsuperscript{25} ibid, pg 16
There were those involved in the Lake Wabamun event, some CN employees among them, that pleaded with Transport Canada to declare the Lake Wabamun incident a “Dangerous Goods” spill, the fact of it being unlisted notwithstanding. Unfortunately, under current legislation, the Department was powerless to do so. Should a similar event occur today, with an equally destructive but unlisted commodity, responders would find themselves equally devoid of Transport Canada’s Dangerous Goods Directorate’s or CANUTEC’s assistance and support. Under the auspices of this RSA review, the opportunity exists to redress this gap and thereby salvage some benefit from the tar balled wreck of those Alberta waters. As James Hoggan reflected:

My father always said that a smart person learns from his mistakes and a genius learns from the mistakes of others. That being the case, in its handling of the Wabamun derailment, CN has arranged a rich learning opportunity, and one that can serve us all.

ii. Cheakamus River Derailment and Spill

Two days after the Lake Wabamun derailment, at approximately 7:15 on August 5, 2006, another Canadian National train, this one snaking its way up the winding track that clings to the edge of the Cheakamus canyon in central British Columbia, offered another occasion for “a rich learning opportunity”. A warning light on the engineer’s panel signaled an unspecified problem in the remote engines midway down the 144 cars that comprised the three-kilometre-long train. In an effort to overcome the loss of power and keep moving forward, the veteran railwayman made the decision to compensate for the lost power by switching on the extra locomotives that were idling near the head of the train. The draft force of this maneuver, exacerbated by the weight and length of the load behind, caused nine of the cars at the front end to leap the track and tumble down the banks of the canyon into the flowing waters of the Cheakamus River. 141 of the cars being hauled that day were unloaded lumber cars; 8 of the 9 that went over the edge were empty. The last car however, was filled with 40,000 litres of a 73% solution of sodium hydroxide, a caustic substance and dangerous good used in many industrial processes more commonly known as lye. The fact that this particular car plummeted into the river turned what in railway terms might be considered a small, albeit spectacular, derailment into an ecological disaster and triggered a series of responses and events that once again tested the capacity of CN and government agencies to react to environmental catastrophe.

26 Conversation with John Read, Director General, Dangerous Goods, May 24, 2007
27 James Hoggan, pg 2
The Transportation Safety Board issued its final report on this spill just days before the completion of this study, but there appears nothing in their findings that would contradict the evidence provided by other government documents and assessments of the incident that have served as the basis for the following observations. In particular, the “Incident Summary Report” prepared by the Ministry of the Environment in British Columbia offers detailed insights into the chronology of actions that were taken and the appropriateness of the response of all stakeholders and agencies involved with the spill.

It should be noted at the outset that the province of British Columbia has established a comprehensive emergency response management program based upon an Incident Command System (ICS) model originally designed in the United States. The ICS model provides a framework for the organization of emergency responders in the event of any form of civic or natural emergency with the objective of ensuring that leadership, whether individual or joint, is quickly established and recognized by all parties, that the jurisdictions of all responders are appropriately respected and their efforts coordinated, and that communications, to the greatest degree possible, are centralized, accurate and consistent. This system, through the exercise of tabletop or simulated incidents, also allows for networks of responders to be established prior to the chaos of an actual event. It helps ensure that individuals are acquainted both personally and professionally and that the responsibilities and accountabilities of each responder and jurisdiction are recognized and understood by each member of the “team”. The advantage to all parties in the event of a real emergency is the ability to quickly establish an organizational structure and leadership framework that emphasizes cooperation and coordination, limits the tendency of each agency to work in “silos” and establishes one centralized command post. This system also encourages communities to identify and establish an Emergency Operations centre (EMO) that can quickly be made operational to provide the communications equipment, office supplies and other resources required by responders to effectively manage the emergency.

Another component of BC’s emergency preparedness infrastructure that proved critical to the effective management of this incident was the existence of the Provincial Emergency Response Program. Once advised of the incident by the RCMP, the members of the emergency response team were able to implement a “call out” protocol to quickly identify and inform all of the responsible federal and provincial government agencies, health authorities and local governments of the event. While the scope of the spill was originally and mistakenly reported as a “small leak”, the fact that all responsible agencies were on stand-by allowed for a more rapid ramp-up when the true extent and implications of the spill were later confirmed.
This issue of the under-reporting of spills is both a significant and difficult one. There appears to be a natural tendency for railways to under-report the extent of a spill at the outset of a derailment until a full assessment of the damage can be made by their own experts. While this may well be a function of the limited capacity of those on the ground to adequately assess the extent of a spill by simply eye-balling it from shore, the assumption of a “best case” scenario until evidence is presented to the contrary, usually several hours later, is at odds with the fact that the greatest environmental damage tends to occur within the first few hours of a spill. Any delays in response that arise from wishful thinking can result in missed opportunities for the containment of pollutants and put both the public and the environment at greater risk.

It is difficult to conclude from the information available whether the initial characterization of the spill as a “small leak” significantly affected the outcome of this incident given the extremely caustic and lethal nature of the substance spilled, but there is no question that certain advisories to the public could have been made earlier had the “worst case” been assumed. In debriefing the event, several issues related to terminology and reporting were identified:

- It was unclear who provided the message that the spill was a ‘leak’, “small” or “contained” to various agencies. CN maintains it did not come from their Incident Commander at the site;
- The terminology used to inform the RCMP was imprecise and affected their response to the situation in terms of public safety;
- The Vancouver Coastal Health Authority was also advised the spill was a ‘leak’ and “contained” and therefore did not attend the scene early or participate in the first public alert provided by the RCMP.28

Among the recommendations made following this event was one suggesting the Provincial Emergency Program initiate a conference call among all responsible agencies within two hours of a Code 2 spill (hazardous material spill that potentially threatens the environment and/or health and safety of neighboring residents) and that a ramp-up be initiated even in the absence of a conclusive assessment. This supports the conclusions of the Alberta Commission that the provincial responders should always assume a “worst case scenario” until evidence to the contrary is confirmed.

It was also recommended that an up-to-date contact list of all the licensed users of the environment (water licenses, wells, river rafting, etc…) should be prepared and revised as necessary in order to facilitate the rapid communication of any potential risks to all parties.

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28 British Columbia Ministry of Environment Lower Mainland Region, “Incident Summary Report - August 5, 2005 spill of 40,000 litres of 73% solution of Sodium Hydroxide into the Cheakamus River North of Squamish British Columbia”, April 13, 2006 pg 7
potentially affected. The information would be collected by the provincial emergency program and made available to responding agencies should the need arise for notification.

In the case of this derailment, the Unified Command Structure jointly administered by CN and the Ministry of Environment was not established until 8:00 p.m. on the evening of the incident. In the hours prior, Incident Command had remained under the authority of CN. Participants felt that during that time, responsible agencies were operating in silos and efforts did not achieve the same level of coordination that they did once the joint command was established and a move to the Squamish Emergency Operations Centre (EMO) was made. Perhaps the lesson to be drawn from this is that simply the existence of an ICS system in a province does not ensure its immediate implementation.

The CN derailment and spill that took place that day killed virtually all of the free-swimming fish in the Cheakamus River. Over 4,700 dead fish were collected by clean-up crews in the days that followed and it was estimated that as many as 501,000 in total were destroyed by the caustic effluent. 40-50% of the 2005 adult Chinook salmon spawning run that year was lost, as were multiple age classes of both Coho and Chinook. Not one fish species indigenous to the river was spared. And while the river water quickly returned to normal pH levels as the effect of dilution mitigated the impact of the original plume of caustic lye, the effect of this event on the ecology of the river and the welfare of the people whose livelihood depends on the health of its fish stocks will likely be significant and persistent. Government reports suggest it will take 50 years for salmon and other fish species to recover. CN continues to work with Federal Fisheries, local First Nations, the District of Squamish and the federal and provincial environment ministries to implement measures that will aid in the return the Cheakamus ecosystem to its pre-spill state.

By late fall of 2005, media reports indicated CN had derailed 11 trains on that same northbound route during that year, with three of those derailments occurring after the Cheakamus incident. Local authorities and environmental groups became incensed over these repeated accidents, convinced that only bald luck had prevented the occurrence of another ecological disaster. The Vancouver Province newspaper reported the Squamish Municipal Council’s call for greater accountability on the part of CN and cited the need for smaller trains and lower speeds to ensure public and environmental safety. The Squamish Environmental Conservation Society, with the support of the Squamish Lillooet Regional District, petitioned the federal government, calling for a progressive penalty system for corporations whose activities cause repeated environmental
damage. “It makes a lot of sense to penalize these companies” said Squamish Mayor Ian Sutherland, “The ultimate concern is to make sure CN does not escape possible fines.”

In response to these derailments, the Transport Minister of the day announced on November 4, 2005 that an Order and Notice was to be placed on CN limiting the length of freight trains traveling on the northbound BC route between Squamish and Clinton to a maximum of 80 cars. Several new, revised Orders and Notices have been issued to CN since that time, with the most recent imposed on January 26, 2006 following a 60-day trial period, that allows for an increase in the length of trains with distributed power on the northbound Squamish route to 114 cars (conventional trains remain limited to 80 cars). The Order also maintains restrictions on how empty cars are handled, requires testing throughout the route to verify that the distributed power is working properly, ensures the presence of a CN supervisor to augment and train any new crew member on the route, imposes a reduction in the number of stops that can occur and requires the implementation of special stall and emergency stop procedures. The Order remains in effect to date.

In addition to the Orders imposed by Transport Canada, CN has incurred significant costs and liabilities related to this spill. In addition to the cost of the river clean-up and direct remediation, the railway has agreed to contribute $1.25 million over 5 years to the Pacific Salmon Foundation to support the rehabilitation of the river system. Litigation and fines are also pending for the railway. The Squamish Band has launched a multi-million dollar law suit against CN and in early August of 2007, the Government of British Columbia announced that five charges would be laid against the railway, two under the Federal Fisheries Act and three under the provincial Environmental Management Act. If convicted, the railway could face fines of up to $300,000 and $1 million dollars respectively.

iii. Englehart Derailment and Spill

In what surely must be one of the rarest spill-related headlines ever to make print in Canada, the CBC on-line banner for March 15th, 2000 read “Ontario Government praises response to derailment”. The article went on to report on the effusive praise being heaped on the Ontario Northland Transportation Commission (ONTC) for the effectiveness of their response to a derailment in Temagami:

29 Kim Thompson, “Second Derailment Worries Squamish”, Canadian Press, The Vancouver Province, Tuesday, October 25, 2005
The province praised the Ontario Northland Transportation Commission on Tuesday for its fast response to a derailment last week that resulted in a huge spill of sulphuric acid into the Blanche River. Northern Development Minister Rick Bartolucci says he was “very, very pleased” with how quickly railway officials were on the scene and how quickly they contained the spill. Bartolucci says people in the area should have the confidence in the railway’s ability to deal with accidents and make the necessary repairs and improvements afterwards...  

The facts of the derailment according to the Transport Safety Board’s investigation and report are as follows: at approximately 1:40 p.m. on March 14, 2000, a southbound freight train traveling from Englehart to North Bay derailed 29 cars just outside of Temagami, Ontario. 25 of the derailed cars contained sulphuric acid and it was estimated that a volume of 386,000 litres of the acidic substance was spilled from the damaged tankers. About 2/3rds of the acid was absorbed into the soil while roughly 144,000 litres spilled into the Martin Creek waterway, 35,000 litres of which eventually migrated through the waterway into Hornet Lake.

The train crew immediately advised their rail traffic centre of the derailment and procedures for the handling of dangerous goods emergencies was quickly initiated. The Ontario Ministry of Natural Resources (ONR) was contacted and within hours of the spill the Ministry’s emergency plan was invoked. ONR also notified first responders (police, fire, etc...), other provincial and federal government agencies, and the shippers, Noranda Inc. and Falconbridge, of the event; all reacted in accordance with established emergency response plans. ONR established its command post at the Temagami town hall while ONR officials and local responders established a perimeter at the site and controlled entry through a checkpoint established several kilometers away. ONR procured the services of several outside companies to assist in the assessment, containment, clean-up and remediation of the spill area, as well as consulting services to assess all civil engineering aspects related to the derailment itself. Provincial authorities advised local residents not to use lake or well water until the clean-up process was completed. Through a system of dams and siphons, much of the spilled acid was removed from the waterway and crushed limestone was applied to areas where the spilled product had collected in order to contain and neutralize the acid. The process of neutralizing all of the sulphuric acid in the waterway was completed by July of 2000 and an assessment of the environmental impact indicated that there was minimal mortality to fish and other aquatic organisms as a result of the spill.  

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31 Transportation Safety Board of Canada, Railway Investigation Report, Main Track Derailment Freight Train No. 402, Mile 63.4, Temagami Subdivision, Temagami, Ontario, 14 March, 2000, Report Number R00T0067, pg 1-5
The TSB report goes on to note that the ONR had conducted regular emergency response training, had participated in the region’s emergency drills and had been in touch with various community emergency responders to discuss the transportation of dangerous goods.32

While the findings of the TSB did identify track failure to be an issue in this derailment, it noted that the ONTC was quick to implement remedial policies to address the maintenance and manpower deficiencies that were cited as contributing factors in the event. Tank car deficiencies that were also identified as contributing to the release were noted by Transport Canada (TC) and since that time, working through the American Railroads Tank Car Committee, tank car standards for dangerous goods have been modified33 to address the issue of valve protection in rollovers such as occurred at this derailment.

The main lesson to be taken from this derailment appears to be the capacity of a well-organized, well-practiced response team to effectively limit the impact of a dangerous goods spill. There is no question that such emergency preparedness has an impact on the effectiveness of the response. It might also be noted that the ONRC is a publicly-owned rail line and therefore accountable to the government of the day and the people of Ontario rather than private shareholders. As such, the railway may have an advantage over their privately-owned counterparts in the ability to work effectively with other publicly-employed responders and to maintain the public interest as a priority at all times.

6. Factors Affecting the State of Readiness in Derailments and Spills

As these three case studies demonstrate, the ability of railways, government agencies and local authorities to respond effectively to major rail spills is dependent upon a number of variables, among them the location of the spill, the availability of equipment, resources and personnel, whether the spilled material is a dangerous good, and the robustness of the provincial emergency response program; even the weather on that particular day can influence the eventual outcome. The corporate culture of the railway involved can play a major role, as can the tenor of the working relationship between the railway, the communities and the government authorities. Historical relationships, both positive and negative, cannot be discounted as a factor and even the character of the individuals immediately involved in the spill and the chemistry among the group coordinating the response can play a role. The numbers of variables and externalities that can impact on any one incident are numerous and complex and it must be recognized that many

32 Ibid, pg 8
33 interview with Danny Simpson, System Director, Dangerous Goods, CN, June 5, 2007
of the factors that govern the management of these incidents lie outside of Transport Canada's control and purview. However even in "sticking to the knitting" of the transport mandate, there appears ample scope for the RSA to be used as an instrument to support the creation of more standardized and effective response programs among the railways, to address the various gaps that have come to light through the evaluation of past incidents and to provide the required leadership that can tip the odds in favour of more positive spill outcomes should they occur in the future.

A) Transportation of Dangerous Goods

The system that has been established under federal and provincial transportation of dangerous goods legislation appears to be generally respected and well understood by railways. Indeed this was the one area where all railway employees contacted for the study appeared well versed in TDG requirements and perhaps the lesson to be taken from this is that the railways respond well to regulation.

While the federal TDG office was generally satisfied with the reporting of incidents, there was stronger dissent in the provinces, particularly from Alberta. A review of a year's worth of DG incident reports in that province indicates little consistency with regard to whom or how quickly these provincial notifications are made, if they are made at all. A list of the incidents involving one Class 1 railway freight company over a 12 month period showed 27 DG incidents. Of these, the railway had notified the provincial DG authority of only 19; of the ones reported, the time delay in reporting was deemed by the authority to be "excessive." A meeting in April 2007 with railway officials and provincial DG authorities to discuss this matter revealed that the company's reporting policy showed no obligation for provincial authorities to be advised of a DG spill even though that reporting requirement is required under federal DG legislation. The company's protocol has subsequently been amended to ensure compliance, but the matter illustrates the fact that confusion around spill reporting, even when the prescriptive protocol of the TDGA is in effect, can exist.

One particular area of concern that was raised in the course of this study revolved around the disposition of dangerous goods during times other than when these goods exist as a component of a "train." There appear to be significant gaps in the authority over the handling of dangerous goods at all other stages of movement, specifically at industrial sidings, during marshalling in the yards, and during switching and transfers (where commodities can be moved as far as 50 kilometres). The prescriptive requirements of the

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34 The Canadian Operating Rules (CROR) define "train" as "an engine or more than one engine coupled, with or without cars, or a track unit(s) so designated by its operating authority, displaying a marker(s)."
TDGA for placarding, ERAPs and paperwork tend not to be well respected during these transitions, creating certain vulnerabilities should a spill occur.

...we handle dangerous goods all the time in the yard and never see any documentation. CN is running out of room in East Vancouver so we're often taking long strings of cars from one CN yard up to the old BC yard to switch them out at BCR; we switch them out, handle them and then send them back. The paperwork never goes with them and these cars are going through heavily populated areas. Railway employees don't know if the cars are empty or what's in them sometimes. The placards don't need to be turned over anymore to tell if it's an empty car like they used to...the ERAP plan is back at the control tower...we have a DG guy but he's never there. – Its kinda funny - he keeps getting these deliveries all the time and we just keep piling them up on his desk...

The railways' practice of "stockpiling" cars at remote sidings was also raised by provincial DG officials as a major concern, particularly since there is no legislated obligation imposed on the railways to advise local authorities of the cars' contents, present documentation, or provide security at these sites. It was noted that in the event of an emergency, the exact contents of the rail cars would not be known to local responders and the capacity of a small community could quickly be overwhelmed by the spillage of a dangerous good.

In response to these issues, Transport Canada has asked CN and CP to develop and file a Rule on transfer movements. According to Luc Bourdon, Director General of Rail Safety at Transport Canada, that rule has now been submitted to Transport Canada and the department has 120 days to conduct its review. Section 19 of the RSA gives the Minister the authority to rewrite any Rule submitted by the industry if it determines that the proposed Rule is in any way deficient in addressing the problems it was designed to resolve. While not specifically aimed at environmental protection, the creation of a Rule to govern transfer movements represents a positive step in addressing the significant loopholes that currently exist in TDG management and due diligence will have to be exercised by TC to ensure that all aspects of this issue are adequately addressed within the scope of this new Rule.

b) Environmentally Hazardous Goods

As the Lake Wabamun derailment has clearly demonstrated, significant problems can arise around the management of spilled goods that are not regulated as "dangerous" under TDG legislation but that can, when spilled, due to sheer quantity or other chemical properties, inflict significant damage on the environment. It should be noted that the current criteria used to identify "dangerous goods" for the purpose of the Transportation of Dangerous Goods Act (TDGA) is

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35 telephone conversation with Canadian National rail yard employee, June 30, 2007
based on an international United Nations designation system that determines the “danger” of a substance primarily on its corrosive or explosive properties. The potential of a substance to inflict environmental damage is not a criterion for the purpose of the UN designation process; hence many substances considered extremely “dangerous” in environmental terms may escape any formal identification as such under current DG legislation.

As has been previously noted, the classification of a commodity as a dangerous good has significant implications. Under the TDG Act, it is a legislated requirement that a detailed Emergency Response Assistance Plan (ERAP) accompany dangerous goods, placards with internationally recognized codes must identify cars carrying these substances and Transport Canada inspectors have the authority to intervene in the event of a spill. All DG incidents benefit from the technical support of CANUTEC. By contrast, environmentally hazardous materials are subject only to the internal emergency response plans of the railways; no detailed emergency response information accompanies these goods and no placards are required to permit immediate identification of the commodity and its properties should that car derail and spill.

The inability of DG legislation to identify and capture this class of environmentally hazardous goods under its legislative umbrella has been recognized as contributing to certain deficiencies that have been identified in past environmentally-significant spills, most notably with the release of the bunker C and pole treatment oils at Lake Wabamun. These deficiencies include the timeliness and accuracy of incident reporting, speed of assessment, availability of expertise and equipment and the coordination of public advisories and communications. Of particular note is the potential lack of reliability in the manifests that accompany these goods and consequently, in the railway’s ability to immediately recognize when a potentially environmentally-damaging substance has been released from a derailed car.

Why do mistakes in consists such as occurred at Lake Wabamun occur? The railways argue that it is difficult, if not impossible, for railway personnel to maintain consistently accurate consists and be aware of the position and content of each rail car in the train given the onloading and offloading that takes place at industrial sidings all along the route. Taking into account the increased length and composition of modern trains, the Canadian public would likely find it unacceptable that railway operators can be responsible for goods strung out over a territory of up to 3 kilometres without the capacity to know the detailed properties of the materials they carry and exactly where that cargo is located on the train at all times. Computer programming and/or and barcode technology could no doubt address any such information deficiencies quite effectively, albeit at some cost to the railways. In this matter, as with the other deficiencies identified above, the lack of any requirement or obligation on the part of railways to exercise a higher degree of
care in the handling and management of ecologically hazardous substances represents a significant gap in the RSA's fulfillment of its environmental mandate.

The Alberta Commission's Report urged Transport Canada, in conjunction with the provinces, to explore the creation of a new emergency response framework designed to address the management of environmentally hazardous substances. One possible way forward might be to create a new category of "environmentally hazardous goods" and a body of regulations around it to ensure appropriate handling and emergency response. This exercise would require the identification of any commodities other than those already captured under TDGA legislation that might pose a hazard to the environment if spilled in sufficient quantity. A comprehensive risk assessment of all transported commodities would have to undertaken to identify which might pose a significant threat to ecology if spilled on differing terrain (e.g., a bunker oil spill into a waterway, on to farmland, etc...). Using the TDG legislation as a template, this regime might require a new system for placarding cars carrying environmentally hazardous goods that would allow for an immediate visual identification of that car's contents should it derail. An obligation for producers to develop detailed, goods-specific response plans similar to ERAPs to accompany these commodities at all stages of transit could include such elements as high-risk assessments, protocols for reporting and call-out, a need for accurate paperwork, information on the properties of the environmentally-hazardous material, a requirement for necessary remediation equipment to be available within three hours of any vulnerable site, an action plan for containment and remediation, a communication strategy and an obligation to share these plans with municipalities and First Nations communities resident in areas of high-risk. There might also be the opportunity to expand the resources of CANUTEC to include expertise on this new category of hazardous goods in order to ensure that appropriate expertise is readily available in the event of a major spill.

For its part, Transport Canada will have to wrestle with the definitive answer to "who is in charge" in the event of spills, especially those that fall outside the purview of TDG authority. Clearly the vacuum in leadership that has been witnessed at many of these incidents and the confusion that appears endemic over who holds the ultimate hammer cannot be allowed to persist. While the railways, as polluter, are ultimately responsible for the clean-up, their prime responsibility is to their shareholders; in the absence of any other imperative, corporations might be expected to act only in the best interests of the corporation rather than in the public interest. Environment ministries, both provincial and federal, have authority to intervene and issue Orders in the event of unauthorized releases, but are not the railways' regulator; as such, their jurisdiction is limited to the ecological impacts of the spill. Local responders have neither the authority nor the capacity to coordinate the overall effort. While provincial initiatives in emergency response can certainly influence the likelihood of a coordinated effort and a positive outcome, as was demonstrated at
Englehart, the reality of corporate-government interface is not always as benign and trusting as that incident might suggest, nor are all provincial governments equally prepared and practiced in emergency response. In the end, it is the Minister of Transport who is responsible for the oversight of railways and therefore that ministry that must be held ultimately accountable for railway preparedness and response. While the effective management of derailment spills is a complicated and multi-faceted challenge, there is no question that the existence of recognized leadership, predetermined and practiced protocols and coordinated communications go a long way to ensuring appropriate outcomes.

c) Local Responders

The question has been raised as to whether local responders have the capacity to respond appropriately to derailment incidents, particularly those that might occur in small communities or remote areas where fire fighters may be volunteers and their resources easily overwhelmed by a major event. While the preparedness of communities is a provincial matter and outside the purview of the RSA, it might be argued that any such deficiencies should be identified through the railways own risk assessment processes and emergency response planning and appropriate efforts made to work with the communities to enhance and ensure capacity in advance of an incident. The existence of a robust provincial emergency response network, a reliable incident command framework and an established network of association among all relevant government response agencies and local authorities is an asset in any large emergency, however such readiness is beyond the scope of the RSA to control. It is the province who designates its preference for “first responders” and these contacts are identified and listed in the reporting protocols of all railways. Only by ensuring that the railways have established strong, effective and cooperative working relationships with each community along its tracks and have in place adequate resources and equipment to deal with any eventuality under any conditions can there be any hope of a seamless and appropriate response in the event of an incident.

This having been said, there is evidence that issues around emergency response between local communities and railways are as much a matter of culture and history as they are capacity. While it is difficult to generalize, the attitude of railways to communities is not always positive and communities can in some instances be equally suspicious and resentful of the railways. The result is an adversarial relationship and/or a lack of trust between local authorities and the railways that is only exacerbated under the pressure of a derailment and spill. Longstanding proximity issues related to noise, spraying, vibration and community safety are generally responsible for many of these railway-community tensions, however such history establishes a difficult context in which to effectively manage a crisis. Similar dynamics appear to be at play in the relationship between First Nations and the railways, although again, generalizations will
always meet with exceptions. The way forward here is more complicated; attitudes often appear entrenched and may in some cases be long-standing. While it may be beyond the scope of the RSA to address these relational issues, they should nonetheless be identified and recognized for the impediment they might represent to an effective local response and the willingness of rail companies to notify and respect local authorities.

Since 1980, Public Safety and Emergency Preparedness Canada allocated over $135 million through its Joint Emergency Preparedness Program (JEPP) to assist municipalities and provinces with projects related to emergency preparedness. Given the high number of derailments and the potential danger such incidents pose to public safety, the opportunity for high-risk communities to avail themselves of this program might be one option available to fund an adequate state of emergency preparedness.

7. **Fines and Penalties**

The principle of “polluter pays” has long been a foundation of Canadian environmental legislation and is embedded in every piece of federal or provincial legislation dealing with unauthorized releases. In the context of rail transport, this means that the railway responsible for the spill is liable for all costs related to damages or remediation arising from that event. In addition, the Canadian Environmental Protection Act (CEPA) allows for the following penalties:

(a) on conviction on indictment, to a fine of not more than $1,000,000 or to imprisonment for a term of not more than three years, or to both; and

(b) on summary conviction, to a fine of not more than $300,000 or to imprisonment for a term of not more than six months, or to both.

Provincial environmental legislation also allows for penalties that range from $500,000 to $1 million upon summary conviction. It should be noted that both federal and provincial environmental protection Acts allow for the polluter to be convicted for a separate offence for each day on which the offence occurs. The liability of directors and officers of the corporation should also be noted as follows:

*Liability of directors and officers — Division 3 of Part 7*

(3) If a corporation commits an offence arising out of a contravention of Division 3 of Part 7, a regulation made under that Division or an order or direction of, or prohibition or
requirement imposed by, the Minister, an enforcement officer or a review officer in connection with an obligation or prohibition under that Division or a regulation made under that Division, every director and officer of the corporation who is in a position to direct or influence the corporation’s policies or activities in respect of conduct that is the subject-matter of the offence is a party to and guilty of the offence, and is liable to the punishment provided for the offence, whether or not the corporation has been prosecuted or convicted.

While these penalties and liabilities might appear significant, evidence seems to indicate they are only rarely pursued. As long as railways respond appropriately to a spill and cover the costs of clean-up and remediation, the environment ministries appear to have little appetite to lay charges over these incidents. One recent exception are the charges levied against Canadian National over the Cheakamus River spill in 2005. Just two days before the two year statute of limitations expired, the Government of British Columbia announced two charges would be laid under the Federal Fisheries Act and three under the BC Environmental Management Act. The federal charges carry a maximum penalty of $300,000 while the charges under the BC legislation could result in a fine of $1 million for each count.

Unfortunately, even at $1 million, these fines represent a very small financial deterrent to railways given the enormous earnings of these corporations. More significant can sometimes be the actual cost of cleaning up the spill and the subsequent expenses associated with remediation of the site to its pre-spill conditions, costs which can reach into the tens of millions of dollars. Likewise, the settlement of law suits launched by municipalities, First Nations or other class action law suits can far exceed any penalties that might be levied through legislation.

Transport Canada also has the capacity to lay charges under Section 33 of the Transportation of Dangerous Goods Act. Penalties are limited to $50,000 for a first offence on summary conviction to a maximum of $100,000 for each subsequent offence. An indictable offence carries with it the possibility of up to two years imprisonment and under sentencing provisions of the Criminal Code; there is no limit to the fine that can be assessed. Section 34 of the TDGA goes on to “require the person to do anything that will assist in repairing any damage to the environment arising out of the commission of the offence” and limits the penalty to be assessed in this regard at $1 million for each offense. According to the Dangerous Goods directorate, the actual imposition of such penalties is rare and no jail term has ever been awarded for a dangerous goods offense.

The RSA also has its own schedule of fines and penalties. Contravention of any provision of Act under Section 41 allows for a penalty upon conviction of an indictable offense for a corporation of up to $200,000 and for an individual of up to $10,000 with a maximum 1 year jail term. Summary convictions and contraventions of Orders, regulations, etc...carry penalties to a maximum of
$50,000 and $5,000 with 6 months respectively. The penalties can be levied for each day the offense is committed.

It should be noted with all of these instruments that charges must be laid within two years of the action that constituted the offense. Before such charges can be levied however, each department must undertake its own due diligence to determine whether an offense has in fact been committed, determine if there is sufficient evidence to prosecute and assess whether such action is warranted. While these departmental investigations can be instructive, the most definitive assessment of any major rail spill is usually rendered by the Transportation Safety Board. The TSB takes approximately two years to investigate and publish its reports, leaving very little time, if any, for departments to compare the results of their own inquiries with the findings of the TSB and move against offending companies while respecting the statute of limitations. Unless the event represents evidence of gross and repeated negligence, there generally appears to be little appetite to pursue any action against the spiller once the public outrage has been spent and the clean-up is underway; most regulators appear satisfied as long as remediation efforts are adequate, the incident was isolated and the company has paid costs. As a result, the fines and penalties presented in the various pieces of applicable legislation would appear to represent little real deterrent to companies; neither their size nor the history of prosecution would suggest they have much to fear.

8. Climate Change and Railway Emissions

The Railway Association of Canada (RAC) has recently undertaken an aggressive marketing campaign in an effort to profile railways as the environmentally responsible choice for freight transport. Indeed, when compared with trucking, a case can be made for certain advantages with rail transport in this regard. Consistent with this effort, the Ministers of Transport and Environment, along with the RAC, announced in May of this year the renewal of a 1995 Memorandum of Understanding (MOU) (originally signed between TC and the RAC) regarding greenhouse gas emissions for the railway industry that includes the following components:

- the adoption of greenhouse gas targets to reduce GHG emissions;
- preparation of an action plan for GHG emissions reduction;
- a commitment to purchase only new, EPA-certified locomotives; and
• the upgrading of existing in-service locomotives when they are overhauled, beginning in 2010, to the EPA standards in effect at that time.\textsuperscript{36}

Critics note that at present these commitments are voluntary, no regulations are in place to compel the rail companies to move forward, and while targets are identified, no specific strategy is in place to determine how emission reductions will be achieved. These deficiencies notwithstanding, Transport Canada has committed $20 million dollars to an Eco-freight Program to assist the transport industry in its efforts to improve emissions performance through demonstration programs and other incentives\textsuperscript{37}, and it may presumed that the railway industry will be awarded appropriate funding to subsidize its efforts in this regard. Environment Canada has outlined a number of preliminary policy options detailing how the achievement of targets might unfold, but at the same time has voiced reservations about the willingness of the railways to undertake the required refurbishments and locomotive purchases should these measures result in any increase in costs.\textsuperscript{38}

It is beyond the scope of this paper to assess the potential for the rail industry to achieve the targets identified within the timetables suggested in the MOU, however some progress on GH emissions appears inevitable due to the highly integrated nature of North American railways. The much more stringent regulations imposed by the Environmental Protection Agency (EPA) on the rail industry south of the border will have an unavoidable impact on rail technology in this country. All railway locomotives purchased by Canadian railways are manufactured in the United States, with the majority of locomotive refurbishments likewise carried out south of the border. It would be difficult if not impossible for Canadian railway companies to buy new locomotives or undertake refurbishments that did not meet the more stringent EPA emissions standards given the integration of the North American railways, and as such, the achievement of the last two elements of the MOU appear highly feasible. As a paper prepared on the reduction of fuel emissions in Canada versus the US explains:


\textsuperscript{37} details on Transport Canada’s Eco-freight program can be found at www.tc.gc.ca/programs/environment/eco-freight/menu-eng.htm

\textsuperscript{38} For a detailed discussion of the policy options re: targets please see Environment Canada, “Review of Memorandum of Understanding Between Environment Canada and The Railway Association of Canada Regarding Railway Locomotive Emissions”, www.ec.gc.ca/learn-air-impur/CAOL/transport/publications/mou/eng/c7_e.htm
In 1998 the U.S. Environmental Protection Agency (EPA) promulgated a rule-making concerning emissions standards for categories of locomotives and locomotive engines operating in the U.S.A. While no legislated standards exist in Canada for locomotive emissions, it is a fact that the equipment and operating context of Canadian railways are highly integrated with those of their American counterparts. As a result, the EPA standards listed below also affect the Canadian railway sector, albeit not in a jurisdictional sense.

- **Tier 0** (1973-2001 locomotives): 34% NOx reduction, caps on other pollutants
- **Tier 1** (2002-2004 locomotives): 49% NOx reduction, caps on other pollutants
- **Tier 2** (2005+ locomotives): 62% NOx reduction, 50% PM and hydrocarbon reductions
  (Note: percentages are relative to a 1997 baseline.)

The willingness of the Canadian rail industry to undertake these emissions reductions might likewise be encouraged by the fact that some of the new engine technologies associated with cleaner emissions also result in increased fuel efficiencies. Given the high percentage of operating costs represented by fuel, this fact alone provides a strong economic incentive for railways to pursue cleaner technologies. By cooperating with TC and EC in the signing of this agreement and undertaking reductions on a voluntary basis, the railways might also avoid the possibility of more stringent and prescriptive regulation in the future. For its part, TC might well be satisfied by the emissions reductions garnered through the higher standards of US regulation and thereby forego the costs, monitoring and enforcement obligations that regulation would impose on the ministry.

While it would be encouraging to conclude that the railway industry has indeed embraced the objectives of energy conservation and emissions reduction, some skepticism over the potential for real progress under this current MOU remains. That being said, the fact that engagement on this issue has been achieved at a national level represents a positive, if tentative, development in the climate change agenda and one that may, over time, realize significant and positive improvements to the railways’ environmental performance.

### 9. Grain spills, Coal Dust and Other Littering

In the Canadian Wheat Board’s submission to the RSA Review Panel, the agency reported that over the course of the 2005-06 and 2006-07 grain shipping year, 6,100 tonnes of grain had been

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39 Transport Canada “Technology to meet EPA locomotive emissions standards without fuel penalties (TP 14124E)”, www.tc.gc.ca/tdc/summary/14100/14124e.htm
lost due to leakage from railway cars, representing a $1.55 million loss to farmers. While this financial impact is significant, the loss of grain from moving railcars has also elicited the attention of numerous wildlife protection organizations who have, for more than two decades, voiced concerns to the railway companies over the high mortality rate of wildlife drawn to the tracks by the temptation of this spillage. The submission to the RSA Panel by Defenders of Wildlife Canada states that “according to Dr. Stephen Herrero, one of Canada’s most respected grizzly bear experts, the Canadian Pacific Railway now is ‘the number one known source of grizzly bear mortality’ in Banff National Park.” The submission goes on to identify the black bear problem at railway sidings where so much grain is spilled from cars while trains are sidelined waiting for other trains to pass that railway employees are afraid to leave their locomotives for fear of attack and traffic jams are created as eager tourists congregate to see the abundance of wildlife assembled to indulge in the feast.

One can think of no other industry involved in the transport of commodities that systematically loses a portion of its load along the route without penalty, consequence or excessive interest on the part of the transporter or the regulator. The issue of incidental spillage from rail cars, whether it is chipped wood, grain, coal dust, plastic pellets or any other commodity has been a flashpoint in community-railway relations for years and speaks to a level of negligence on the part of the rail industry that is significantly out of step with Canadian societal and environmental norms.

While a new initiative has been recently announced by Transport Canada to replace the fleet of federally-owned hopper cars and several other commodity shippers, including those that manufacture plastic pellets, have undertaken significant efforts to address the incidental spillage issue on their own, the fact of the railways’ tolerance of this ongoing spillage appears at odds with the “green” image they are attempting to promote through their marketing divisions and the RAC. Improvements to rail car design, impelled by higher standards south of the border, will no doubt address these issues over time; however these improvements could take a generation or more to implement and the practice is already a generation or more out of step with responsible standards of environmental stewardship. If the RSA is to be an effective tool of environmental protection, it would seem that it was precisely this type of persistent pollution that Parliament had in mind when it granted the Transport Minister the authority to regulate.

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40 Presentation of the Canadian Wheat Board to the Railway Safety Review Panel, June 8, 2007, Winnipeg Manitoba, pg 3.
41 James, Pissot, Submission to the RSA Review Panel by the Defenders of Wildlife Canada, April 9, 2007 pg. 1
10. Institutional Capacity – Transport Canada

In providing a strategic overview of the 1999 Amendments to the RSA, Transport Canada recognized the burden that these new authorities, including environmental management, would place on the institutional capacity of its organization. It wrote:

These new and enhanced functions will require new competencies, shifts in resource allocation and, potentially, additional resources. New competencies in statistical analysis and auditing will be required for program staff. However, traditional technical skills will continue to be important to ensure the credibility of the program in the eyes of industry. Resource shifts will be necessary at headquarters and in the regions in order to take on new functions and increase the emphasis on selected existing functions. Because Rail Safety staff are already stretched and no current activities are going to be entirely abandoned, at least in the short-term, it is expected that additional resources will be required.42

In the end, the ability of Transport Canada to fulfill the obligation of environmental protection and provide some degree of credible oversight and accountability to the Canadian public in this regard comes down to issues of capacity and resources. Any serious new program, initiative or regulation to enhance environmental management within the railway industry will bring with it an obligation to facilitate, monitor and enforce; to date there is little evidence that the department has explored the potential of this new function or developed an agenda much beyond the parameters of the government-wide climate change mandate. Any changes to the RSA to enhance environmental protection that might emanate from this Review process will therefore require an appropriate allocation of resources and expertise to ensure sufficient institutional capacity is available to carry out such a mandate.

11. Recommendations

In light of the findings of this study, the author respectfully submits the following recommendations for the consideration of the RSA Review Panel:

1. that the “Objectives” of the RSA be clarified to reflect Parliament’s intended priority with regard to protection of property versus protection of the environment. Given the often

conflicting relationship of these two objectives, clarification within the RSA would serve to inform railways in the determination of their own emergency response priorities;

2. that Transport Canada undertake a comprehensive study of environmental management in the railway industry. This in-depth investigation would assist in the establishment of industry-wide baseline performance measures; identify national and international best practices; determine the current level of environmental emergency response capacity; and provide the basis for the establishment of rail industry guidelines, targets and standards appropriate to the effective stewardship of railway lands and the protection of the Canadian environment;

3. that Transport Canada, in conjunction with the appropriate provincial authorities, develop regulations for the handling of environmentally-hazardous goods not covered under the Transportation of Dangerous Goods Act;

4. that Transport Canada, in conjunction with the RAC, establish a Canadian standard of emergency response for the railway industry that would incorporate as a minimum the standards of the Canadian Standards Industry (CSI) with the objective of ensuring a consistent level of environmental emergency preparedness among all rail freight carriers;

5. that the RSA oblige the railways to file environmental management plans and compliance audits with Transport Canada on an annual basis;

6. that Transport Canada develop sufficient institutional capacity and environmental expertise to ensure appropriate oversight of the railway industry with regard to all aspects of environmental protection.

12. Conclusion

In a 1954 paper entitled “Economics of Canadian Transportation”, the preeminent Canadian historian Michael Bliss posed the question of whether transportation services were “to be regarded as business institutions like department stores, factories, or farms, or ... to be looked upon as almost eleemosynary agencies wherein the cost-revenue relationship is subordinate to the welfare of the public?” In the fifty-two years since Professor Bliss framed that pivotal question, there is little doubt which direction transportation policy has taken. The one fact in this study upon

43 eleemosynary – meaning “charitable”
which there has been unanimous consensus is that the principle and possibly only driver of the railway industry today is the maximization of profit. Anything that interferes with that priority is given short shrift by railway management unless regulation compels compliance.

Given that reality, the Railway Safety Act is one instrument available to mediate the relationship between corporate interests and public welfare and as such, represents a key mechanism by which government exercises its obligation to protect the interests of civil society. A critical component of that public welfare is acknowledged to include environmental protection and the challenge presented to the RSA Review Panel is how best to ensure that this objective is internalized within the regulatory framework and operational policies of commercial railways.

It perhaps goes without saying that the greatest achievement that the RSA can accomplish in terms of environmental protection is to ensure that the trains stay safely on the tracks. However if zero tolerance of derailments and spills is considered too high a performance criterion to practically achieve, the challenge then becomes to determine what degree of compromise the Canadian public is willing to accept in terms of the risks to ecological integrity posed by unsafe railway practices. Equally important to determine is the level of expense the industry is willing to tolerate to accommodate public expectations of environmental safety. Identifying just where that harmonious intersection of public-private tolerance lies might be one of the truly great challenges facing the 2007 Review Panel.

While some positive achievements have been accomplished on the environmental front within the railway industry, it seems apparent that many of these accomplishments have been largely driven by the stricter environmental standards imposed by the EPA on the US rail industry, by US requirements for the upgrading of railcars, or by initiatives taken by other Canadian industries and associations, such as the Responsible Care Program of the Canadian Chemical Producers (CCPA). As the testimony of front line rail employees can attest, any corporate commitments to principles of robust environmental stewardship promised by the corporate environmental policies of the major rail lines are not universally borne out by actions at the operating level. This apparently superficial commitment on the environmental front by Canadian railways is perhaps not surprising given the tepid level of engagement in the environment file currently demonstrated by Transport Canada. And while there is no question that efforts are made by railways to achieve compliance with the somewhat convoluted environmental regulatory regime that governs railways operations, the very multi-faceted jurisdictional nature of this regulatory framework has created a regulatory silt of hand where it appears that everyone is in charge, while in reality often no one is in charge. This vacuum of ultimate authority and oversight is often best demonstrated at the site of major environmental disasters occasioned by non-DG spills, where all responsible parties
are searching for leadership and no ordinance exists to define exactly who that authority should be. A service would be rendered to all parties by the clarification of that gap.

It has been suggested that any efforts to enhance or subsidize the railways’ capacity for emergency response is in fact a tacit acceptance of the fact that they will continue to push the risk/benefit envelope to the point of environmental disaster. It is a suggestion that does give pause. While there can be no doubt that derailments and spills cost railways, they cost the public more. As such, it is incumbent upon government to ensure the greatest level of emergency preparedness possible and to achieve this, railways must be engaged and held to account in advance of a tragedy. Improvements to emergency response capacity, the handling of dangerous and environmentally hazardous goods and the establishment of sound environmental management practices all take time and resources and therefore are not likely to be undertaken spontaneously by railways. The expertise and capacity to provide such environmental leadership does not currently reside within Transport Canada, nor is it likely to emerge from the RAC. The first tentative step in this direction was nonetheless made in 1999 when environmental protection was first entrenched as an objective of the RSA; the opportunity to put some substance to that intent resides with the review process of 2007.
Appendix 1 - Environmental Regulatory Framework

FEDERAL LEGISLATION

Canada Water Act
Canadian Environmental Protection Act
  • Environmental Emergency Regulations
Canadian Environmental Assessment Act
Species at Risk Act
Environmental Contaminants Act
Fisheries Act
Navigable Waters Protection Act
Pest Control Products Act
Transportation of Dangerous Goods Act

PROVINCIAL LEGISLATION

British Columbia
Health Act
  • Safe Drinking Water Regulations
  • Sanitary Regulations
  • Sewage Disposal Regulations
Drinking Water Protection Act
  • Drinking Water Protection Regulation
Pesticide Control Act
  • Pesticide Control Act Regulation
Transportation of Dangerous Goods Act
  • Transportation of Dangerous Goods Regulation
Environmental Management Act
  • Spill Reporting Regulation
  • Petroleum Storage and Distribution Facilities Storm Water Regulation

Alberta

Environmental Protection and Enhancement Act
  • Alberta Ambient Air Quality Guidelines
  • Ozone-Depleting Substances and Halocarbons Regulation
  • Pesticides Sales, Handling, Use and Application Regulation
  • Waste Control Regulation
  • Release Reporting Regulation
  • Wastewater and Storm Drainage Regulation
Drinking Water Protection Act
  • Drinking Water Protection Regulation
Public Health Act
• Nuisance and General Sanitation Regulation

Dangerous Goods Transportation and Handling Act
• Dangerous Goods Transportation and Handling Regulations

Water Act
• Water Regulation

Saskatchewan
Clean Air Act
• Clean Air Regulations

Dangerous Goods Transport Act
• Dangerous Goods Transportation Regulations

Environmental Management and Protection Act, 2002
• Environmental Spill Control Regulations
• Hazardous Substances and Waste Dangerous Goods Regulations
• PCB Waste Storage Regulations
• Surface Water Quality Objectives
• Water Regulations

Litter control Act
• Litter Control Act Regulations
• Manual for Waste Disposal Procedures

Pest Control Products (Saskatchewan) Act
• Pest Control Products Regulations

Public Health Act

Manitoba

Dangerous Goods Handling and Transportation Act
• Classification Criteria for Products, Substances and Organism Regulation
• Environmental Accident Reporting Regulation
• PCB Storage Site Regulation
• Storage and Handling of Petroleum Products and Allied Products Regulation

Environment Act
• Guidelines for Various Air Pollutants
• Litter Regulation
• Pesticides Regulation
• Onsite Wastewater Management Systems Regulation
• Manitoba Surface Water Quality Objectives

Ozone Depleting Substances Act
• Ozone Depleting Substances Regulation

Pesticide and Fertilizers Control Act
• Pesticides and Fertilizers Licence Regulation

Public Health Act

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• Collection and Disposal of Wastes Regulation
• Protection of Water Sources Regulation
• Water Works, Sewerage and Sewage Disposal Regulation

Ontario

Dangerous Goods Transportation Act
• General Regulation

Endangered Species Act
• Endangered Species Regulation

Technical Standards and Safety Act, 2000
• Fuel Oil

Environmental Protection Act
• General - Air Pollution Regulations
• Ambient Air Quality Criteria Regulation
• Designation of Waste Regulation
• Guidelines for Use at Contaminated Sites in Ontario
• Ozone Depleting Substances - General Regulation
• Spills Regulation
• Waste Management - PCBs Regulation
• Water Management – Guidelines and Procedures of the Ministry of Environment and Energy

Ontario Water Resources Act
Pesticides Act
• General Regulation

Waste Management Act

Quebec

Environment Quality Act
• Quality of Drinking Water Regulation
• Hazardous Materials Regulation
• Quality of the Atmosphere Regulations
• Solid Waste Regulations
• Used Tire Storage Regulation
• Waterworks and Sewer Services Regulation

Pesticides Act
Petroleum Products and Equipment Act
• Petroleum Products and Equipment Regulation

New Brunswick

Clean Air Act
• Air Quality Regulation
• Ozone Depleting Substances Regulation

Clean Environment Act
• Petroleum Product Storage and Handling Regulation
• Water Quality Regulation

Clean Water Act
• Watercourse and Wetland Alteration Regulation

Endangered Species Act
Health Act
• General Regulation

Pesticides Control Act
• General Regulation

Transportation of Dangerous Goods Act
• General Regulation

Unsightly Premises Act

Nova Scotia
Dangerous Goods Transportation Act
• Dangerous Goods Transportation Regulations

Environment Act
• Emergency Spill Regulations
• Solid Waste Resource Management Regulations
• On-Site Sewage Disposal Systems Regulations
• Ozone Layer Protection Regulations
• Pesticide Regulations

Water Resources Protection Act

Prince Edward Island

Dangerous Goods (Transportation) Act
• Dangerous Goods (Transportation) Regulations

Environmental Protection Act
• Air Quality Regulations
• Lead-Acid Battery Regulations
• Litter Control Regulations
• Petroleum Storage Tanks Regulation
• Sewage Disposal Systems Regulations
• Used Oil Handling Regulations
• Water Quality Certificate Regulations

Highway Traffic Act
Pesticides Control Act
• Pesticides Control Regulations

Public Health Act
Unsightly Property Act
Water and Sewerage Act
Newfoundland
Dangerous Goods Transportation Act
  • Dangerous Goods Transportation Regulations

Environmental Protection Act
  • Air Pollution Control Regulations
  • Storage and Handling of Gasoline and Associated Products Regulations
  • Pesticides Control Regulations
  • Storage of PCB Wastes Regulations

Health and Community Services Act
  • Sanitation Regulations

Waters Resources Act

Northwest Territories
Environmental Protection Act
Forest Protection Act
Pesticide Act
  • Pesticide Regulation

Public Health Act
  • General Sanitation Regulations

Transportation of Dangerous Goods Act
  • Transportation of Dangerous Goods Regulations
Appendix 2 - Reportable Spills

Table 1 CPR-Canada Guidelines for Reporting TDG Regulated Materials

<table>
<thead>
<tr>
<th>TDG Class</th>
<th>Description</th>
<th>Minimum Reportable Discharge Limits (*)</th>
<th>Environmentally Sensitive Areas, Potential Danger to Public Safety or Rolling Stock Incidents (**)</th>
<th>Examples (not an inclusive list)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Explosives</td>
<td>all</td>
<td>all</td>
<td>fuses, torpedoes</td>
</tr>
<tr>
<td>2.1</td>
<td>Flammable gas</td>
<td>100 L or any sustained release of 10 minutes or more</td>
<td>all</td>
<td>propane, acetylene, hydrogen, liquified petroleum gas</td>
</tr>
<tr>
<td>2.2</td>
<td>Non-flammable, non-toxic gas</td>
<td>100 L or any sustained release of 10 minutes or more</td>
<td>all</td>
<td>anhydrous ammonia, argon, helium, oxygen</td>
</tr>
<tr>
<td>2.3</td>
<td>Toxic gas</td>
<td>all</td>
<td>all</td>
<td>ammonia, chlorine, hydrogen chloride, methyl bromide</td>
</tr>
<tr>
<td>3</td>
<td>Flammable Liquids</td>
<td>50 L</td>
<td>all</td>
<td>acetone, diesel fuel, fuel oil, gasoline, isopropanol, kerosene, methanol, methyl e chloride, mineral spirits, naptha, petroleum crude oil, petroleum distillates, tarpentine, varsol</td>
</tr>
<tr>
<td>4.1</td>
<td>Flammable solids</td>
<td>1 kg</td>
<td>all</td>
<td>magnesium, sulphur, molten sulphur</td>
</tr>
<tr>
<td>4.2</td>
<td>Spontaneously combustible solids</td>
<td>1 kg</td>
<td>all</td>
<td>ferrous metal shavings, borings and cuttings</td>
</tr>
<tr>
<td>4.3</td>
<td>Dangerous when wet</td>
<td>1 kg</td>
<td>all</td>
<td>alkali metal alloys, aluminum hydride, lithium, zinc powder or ashes</td>
</tr>
<tr>
<td>5.1</td>
<td>Oxidizer</td>
<td>1 L or 1 kg or 50 L or 50 kg</td>
<td>all</td>
<td>ammonium nitrate</td>
</tr>
<tr>
<td>Packing Group I &amp; II</td>
<td></td>
<td></td>
<td></td>
<td>chlorate and borate mixtures, hydrogen peroxide, magnesium peroxide, sodium peroxide, sodium nitrate, sodium chlorate</td>
</tr>
<tr>
<td>Packing Group III</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2</td>
<td>Organic peroxide</td>
<td>1 L or 1 kg</td>
<td>all</td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Toxic</td>
<td>1 L or 1 kg or 5 L or 5 kg</td>
<td>all</td>
<td>disinfectants, herbicides, pesticides</td>
</tr>
<tr>
<td>Packing Group I &amp; II</td>
<td></td>
<td></td>
<td></td>
<td>arsenic, carbon tetrachloride, copper cyanide, ethyl bromide, pentachlorophenol, glycol</td>
</tr>
<tr>
<td>Packing Group III</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>Infectious</td>
<td>all</td>
<td>all</td>
<td>biomedical waste</td>
</tr>
<tr>
<td>7</td>
<td>Radioactive materials</td>
<td>all</td>
<td>all</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Corrosive</td>
<td>5 kg or 5 L</td>
<td>all</td>
<td>hydrochloric acid, sodium hydroxide, sulphuric acid, potassium hydroxide (caustic potash)</td>
</tr>
<tr>
<td>9</td>
<td>Miscellaneous Products</td>
<td>all</td>
<td>all</td>
<td>lead sulphide</td>
</tr>
<tr>
<td>PCBs</td>
<td>all</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asbestos</td>
<td>all</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalt</td>
<td>1 kg or 25 kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmentally Hazardous</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Dangerous Waste

<table>
<thead>
<tr>
<th></th>
<th>5 L or 5 kg</th>
<th>all</th>
<th>containing petroleum products/heavy metals</th>
</tr>
</thead>
<tbody>
<tr>
<td>(*) Per event</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(**) Per event</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regardless of quantity, all accidental releases of dangerous goods in environmentally sensitive areas, or with the potential to endanger public safety, or involving rolling stock must be reported. Environmentally sensitive areas include ALL PARKS, sewers, drains, manholes, rivers, creeks, streams, oceans, wetlands, and other water courses.

**Table 2 CPR-Canada Guidelines for Reporting Non-TDG Regulated Materials**

<table>
<thead>
<tr>
<th>Examples (not an all inclusive list)</th>
<th>Minimum Reportable Discharge Limits (*)</th>
<th>Environmentally Sensitive Areas, Potential Danger to Public Safety (**)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>100 kg</td>
<td>all</td>
</tr>
<tr>
<td>Potash (Potassium chloride)</td>
<td>100 kg</td>
<td>all</td>
</tr>
<tr>
<td>Grease or lubricating oils</td>
<td>50 L</td>
<td>all</td>
</tr>
<tr>
<td>Waste oils that do not meet the definition of a TDG class 3 or 9</td>
<td>50 L</td>
<td>all</td>
</tr>
<tr>
<td>Edible oils (e.g. canola, rapeseed, vegetable and palm oils)</td>
<td>100 L</td>
<td>all</td>
</tr>
<tr>
<td>Molasses, corn syrup</td>
<td>100 L</td>
<td>all</td>
</tr>
<tr>
<td>Other liquid food products</td>
<td>100 L</td>
<td>all</td>
</tr>
<tr>
<td>Grain, cereals</td>
<td>200 kg</td>
<td>all</td>
</tr>
<tr>
<td>Other solid food products</td>
<td>200 kg</td>
<td>all</td>
</tr>
<tr>
<td>Household cleaners, detergents, soaps</td>
<td>100 kg</td>
<td>all</td>
</tr>
<tr>
<td>Paper, plastic pellets, wood chips, other solid commodities</td>
<td>200 kg</td>
<td>all</td>
</tr>
</tbody>
</table>

(*) Per event
(**) Regardless of quantity, all accidental releases in environmentally sensitive areas, or accidental releases with the potential to endanger public safety must be reported. Environmentally sensitive areas include ALL PARKS, sewers, drains, manholes, rivers, creeks, streams, oceans, wetlands, and other water courses.