

**Canadian Institute of Resources Law  
Institut canadien du droit des ressources**

# **Environmental Assessment of Nuclear Power Plants in Alberta**

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## Summary

This paper focuses on the nuclear licensing process which is the environmental impact assessment. In the Alberta context, the jurisdictional power over environmental impact assessments and provincial legislation are analyzed to enhance the understanding of potential conflicts that arise if plans to construct a nuclear power plant in Alberta become real. Although, this approach seems to be of a theoretical nature at present, during nuclear conferences questions centering on the division of power and its consequences were raised by the oil sands industry. Consequently, there is a demand for clarification which this paper attempts to address.

This paper examines the environmental assessment process for nuclear power plants in Alberta and the experience in other provinces. In particular, it raises the question of which government(s) (federal, provincial) has the jurisdiction to carry out an environmental impact assessment of nuclear power plants in Alberta. Environmental assessment here refers to assessment of the site preparation construction, and operation of a nuclear power plant. The licensing of other stages within the nuclear cycle, such as nuclear fuel waste management, decommissioning and their interrelationship to environmental assessments, are not the subject of this paper.

The paper consists of five parts. The first part provides an introduction and the second part provides a short overview of the nuclear cycle. The third part considers the division of powers regarding energy policy and nuclear energy. The fourth part analyzes whether the *Canadian Environmental Assessment Act* and Alberta's *Environmental Protection and Enhancement Act* trigger an environmental assessment of a prospective nuclear power plant. The fifth part provides conclusions.

The future of nuclear energy today is more insecure than it was before March 11, 2011, the day when Fukushima began to become a stand-alone term for the worst nuclear accident worldwide. Nuclear energy, however, is part of the world's energy mix. It cannot be eliminated from one day to the next because of the time and cost intensive nature of nuclear plants and decommissioning. The lessons to be drawn from Fukushima and whether the nuclear renaissance is over will be seen in the future. Meanwhile, proposed nuclear power plants in Alberta continue to raise legal questions. Bruce Power Alberta planned to prepare a site, to construct and operate a nuclear power plant in the Peace River area, one of the major oil sands areas in Alberta. Nuclear energy for the oil sands would partly replace natural gas for energy generation for bitumen extraction and processing. The construction of nuclear power plants in Alberta raises interesting legal questions. This paper addresses one of the first issues, namely, whether the federal and/or the provincial government has the jurisdiction to carry out an environmental impact assessment of nuclear power plants in Alberta. Although the answer to this question appears to be simple at a first glance because the federal government has the exclusive federal power over nuclear power, this paper will examine the uncertainty surrounding the division of powers. For example, the responsibility to carry out an environmental assessment over water use in a nuclear power plant raises questions about federal and provincial jurisdiction.



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## Table of Abbreviations

AECA	<i>Atomic Energy Control Act</i>
AECL	Atomic Energy of Canada Limited
ADR	<i>Activities Designation Regulation</i>
ADR	<i>Activities Designation Regulation</i>
AER	Alberta Energy Regulator
CANDU	Canada Deuterium Uranium
CEAA (2012)	<i>Canadian Environmental Assessment Act (S.C. 2012)</i>
CEAA (1992)	<i>Canadian Environmental Assessment Act (S.C. 1992)</i>
CEA Agency	Canadian Environmental Assessment Agency
CEPA	<i>Canadian Environmental Protection Act</i>
CNSC	Canadian Nuclear Safety Commission
CO <sub>2</sub>	carbon dioxide
DNRA	<i>Department of Natural Resources Act</i>
EA	environmental assessments
EPEA	<i>Environmental Protection and Enhancement Act</i>
ERCB	Energy Resources Conservation Board
GJ	gigajoule
GWe	gigawatts electric
IAEA	International Atomic Energy Agency
MIT	Massachusetts Institute of Technology
MOU	Memorandum of Understanding
MOX	mixed oxide
MW	megawatts
MWe	megawatts electrical
NEA	<i>Nuclear Energy Act</i>
NEB	National Energy Board
NSCA	<i>Nuclear Safety and Control Act</i>
POGG	peace, order and good government power

SEA            strategic environmental assessment

WNA            World Nuclear Association

## Part 1 Introduction

### 1.1 Alberta Oil Sands

Canada has the second largest proven reserves of crude oil globally behind Saudi Arabia<sup>1</sup> and the largest oil sands (also called tar sands)<sup>2</sup> deposits in the world behind Venezuela.<sup>3</sup> It is the only country with a large-scale commercial oil sands industry. The large-scale oil sands industry is situated mainly in Northern Alberta; the three oil sands areas are the Peace River, the Athabasca and the Cold Lake.<sup>4</sup> Alberta's oil sands deposits are estimated to contain 1.71 trillion barrels of bitumen.<sup>5</sup>

Two options are available to extract the petroleum from the oil sands. Open pit mining is currently the main extraction method.<sup>6</sup> The second method is *in situ* extraction when steam is injected into the formation in order to soften the bitumen which then is pumped to the surface.<sup>7</sup> The majority of the bitumen (135 billion barrels) is estimated to be only recoverable by *in situ* techniques.<sup>8</sup> This is because the choice and feasibility of surface mining and *in situ* extraction “is based on the thickness of the surface cover, or overburden, situated above the bitumen deposit, with mining operations generally limited to areas where the overburden thickness is 75 metres or less.”<sup>9</sup>

According to report ST98-2013 issued by the Energy Resources Conservation Board (ERCB), now the Alberta Energy Regulator (AER), Alberta's production of conventional

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<sup>1</sup> Canada's proven crude oil reserve is estimated to be 175.2 billion barrels. Around 170 billion barrels (equals 97%) of its reserves are unconventional from bitumen deposits. US Energy Information Administration, “Country Analysis Brief – Canada” (April 2011) at 2 [US EIA, “Canada Country Analysis Brief”], online: US EIA <<http://www.eia.doe.gov/countries/cab.cfm?fips=CA>>. For comprehensive information about Canada's and Alberta's oil sands, see: National Energy Board, *Canada's Oil Sands: Opportunities and Challenges to 2015* (Calgary: NEB, 2004) [NEB, *Canada's Oil Sands*]; NEB, *Canada's Oil Sands – Opportunities and Challenges to 2015: An Update* (Calgary: NEB, 2006).

<sup>2</sup> “Oil sands are composed of bitumen, a heavy and viscous tar-like oil, contained in a mixture of sand, clay and water.” House of Commons, *The Oil Sands: Towards Sustainable Development – Report of the Standing Committee on Natural Resources* (Ottawa: 2007) at 4.

<sup>3</sup> NEB, *Canada's Oil Sands*, *supra* note 1 at 4-5; House of Commons, *ibid* at 5.

<sup>4</sup> ERCB, *ST98-2013: Alberta's Energy Reserves 2012 and Supply/Demand Outlook 2013-2022* (Calgary: AER, 2013) at 3-2 [ERCB, *ST98-2013*].

<sup>5</sup> Government of Alberta, *Responsible Actions: A Plan for Alberta's Oil Sands* (February 2009) at 4. From the 1.7 trillion barrels, around 315 billion barrels are potentially recoverable. Established oil sand reserves, meaning the portion which is economically extractable by using current technologies, are estimated to be 174 billion barrels. House of Commons, *supra* note 2 at 4.

<sup>6</sup> World Nuclear Association (WNA), Factsheet, “Nuclear Power in Canada Appendix 2” (February 2010) at 1 [WNA-CAN II]; Drawbacks of pit mining are the creation of residual toxins, also called tailings, alteration of landscapes and ecosystem.

<sup>7</sup> US EIA, “Canada Country Analysis Brief”, *supra* note 1 at 4; WNA-CAN II, *ibid* at 1. *In situ* extraction techniques are for example cyclic steam stimulation and steam-assisted gravity drainage.

<sup>8</sup> NEB, *Canada's Oil Sands*, *supra* note 1 at 4; US EIA, “Canada Country Analysis Brief”, *ibid* at 4.

<sup>9</sup> NEB, *Canada's Oil Sands*, *ibid* at 4.

crude oil amounted to 204 million barrels in 2012.<sup>10</sup> The supply of crude oil reached 2.5 million barrels per day, a 10% increase from 2011. Further, the report estimates the production of crude oil to reach 4.2 million barrels per day by 2022. The crude bitumen production reached  $112 \times 10^6 \text{ m}^3$  with *in situ* operations contributing  $58 \times 10^6 \text{ m}^3$ .<sup>11</sup> In 2012, Alberta produced  $305.5 \times 10^3 \text{ m}^3/\text{d}$  of crude bitumen compared with  $277.2 \times 10^3 \text{ m}^3/\text{d}$  in 2011.<sup>12</sup> Overall, the increase in crude bitumen production of  $28.3 \times 10^3 \text{ m}^3/\text{d}$  represents an annual increase of 10.2%, higher than the production increase of 8.2% between 2010 and 2011. Production from *in situ* projects exceeded mine production for the first time in 2012, a trend that is expected to continue. In 2012, *in situ* production accounted for 52% of total bitumen production, compared with 49% in 2011.<sup>13</sup> For 2022, the *in situ* crude bitumen production is forecasted to increase to  $350.8 \times 10^3 \text{ m}^3/\text{d}$ , of which the *in situ* bitumen is expected to account for 58% of total bitumen produced by 2022.<sup>14</sup>

Historically natural gas<sup>15</sup> is used as the main energy source to enable production processes.<sup>16</sup> Energy is necessary for the mining, extraction and upgrading operations. For *in situ* operations the gas is used to generate steam and heat for bitumen recovery, and generally electricity is used to operate equipment and facilities.<sup>17</sup> The use of natural gas prompts concerns regarding its cost and the emission of carbon dioxide (CO<sub>2</sub>).<sup>18</sup>

Another option to generate reliable base-load of electricity is by the use of nuclear power. Nuclear energy is such an option which is discussed and considered for the Albertan oil sands processing because the use of nuclear energy, especially for the steam and electricity production, would release much smaller CO<sub>2</sub> emissions.<sup>19</sup>

The idea to use nuclear energy in the Alberta oil sands is not new and was first discussed after the 1973 Arab oil embargo.<sup>20</sup> In 1976 and 1977 Atomic Energy of Canada Limited published two reports assessing nuclear energy for the oil sands from a cost comparative perspective with fossil fuels.<sup>21</sup> The 1976 report concluded, among other

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<sup>10</sup> ERCB, *ST98-2013*, *supra* note 4 at 12.

<sup>11</sup> ERCB, *ST98-2013*, *ibid* at 3-2.

<sup>12</sup> ERCB, *ST98-2013*, *ibid* at 3-11.

<sup>13</sup> ERCB, *ST98-2013*, *ibid* at 3-11.

<sup>14</sup> ERCB, *ST98-2013*, *ibid* at 3-20.

<sup>15</sup> According to the WNA, approximately 1.05 GJ (gigajoule) of natural gas have to be used in order to produce a barrel of bitumen from which synthetic crude oil will be generated. Then the bitumen must be upgraded to oil. The extraction of the bitumen “represents almost 30 cubic metres per barrel of oil (embodying 6 GJ), and in 2006 it accounted for more than 40% of Alberta’s natural gas demand.” Predictions suggest a four-fold increase in gas use of 3 million barrels per day by 2016 and a six-fold increase of predicted 5 million barrels per day by 2024. This will lead to a dramatic rise in costs. WNA-CAN II, *supra* note 6.

<sup>16</sup> NEB, *Canada’s Oil Sands*, *supra* note 1 at 83.

<sup>17</sup> NEB, *Canada’s Oil Sands*, *ibid* at 83.

<sup>18</sup> WNA, Factsheet, “Nuclear Power in Canada” (26 May 2010) at 6 [WNA-CAN].

<sup>19</sup> Shaun Polczer, “Alberta Nuclear Future a Step Closer”, *Calgary Herald* (28 August 2007), online: *Calgary Herald* <<http://www.canada.com/calgaryherald/story.html?id=73ed7091-3d0d-4202-b99d-2effe916456d&k=96427>>; House of Commons, *supra* note 2 at 30.

<sup>20</sup> NEB, *Canada’s Oil Sands*, *supra* note 1 at 110.

<sup>21</sup> VR Puttagunta, RO Sochaski & RFS Robertson, “A Role for Nuclear Energy in the Recovery of Oil

things, that “[i]ntegration of nuclear energy with the tar sands development will provide the shortest, most efficient and economical route to convert nuclear energy into liquid hydrocarbons.”<sup>22</sup> From a comparative view of costs between nuclear and fossil-fired plants, the report arrived at the conclusion that the capital costs for a nuclear power plant are twice as high as those for coal stations but that the fuel costs of coal stations are much larger by a factor of five.<sup>23</sup>

Today, the nuclear industry adapts its technology to changing requirements. Currently, nuclear companies are developing small modular reactors in order to meet the demand towards smaller reactors which are economically more affordable in terms of the purchase price and insurance premiums.<sup>24</sup> In addition smaller reactors offer more flexibility as opposed to normal sized nuclear reactors. Duncan Hawthorne explained the advantage as follows: “[o]ne thing that has been talked about is the ability to have small modular reactors that you would site around in areas where you do not need a big demand or, indeed, you need local sources. The oil sands [are] a great example of that.”<sup>25</sup>

### 1.1.1 Bruce Power — Alberta Project

Project proposals in Alberta have considered electricity generated from nuclear power plants as an option to meeting the immense and growing energy demand which the Northern Alberta oil sands industry requires for its operation.

In March 2008 Bruce Power filed an application to prepare a site for the future construction and operation of the first nuclear power plant at Lac Cardinal near Peace River, situated 500 km northwest of Edmonton.<sup>26</sup> Bruce Power planned a nuclear plant with a proposed capacity of 4,000 megawatts electrical (MWe) at a cost of up to \$10 billion;<sup>27</sup> operations were envisioned to start in 2017.<sup>28</sup> The application was reviewed by

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from the Tar Sands of Alberta” (1977) 16:3 *Journal of Canadian Petroleum Technology*; RO Sochaski & DW Smith, *A Cost Comparison of Nuclear and Fossil Power for the Alberta Tar Sands* (Pinawa: Atomic Energy of Canada Limited, AECL-5682, 1977).

<sup>22</sup> Puttagunta, Sochaski & Robertson, *ibid* at 39.

<sup>23</sup> Sochaski & Smith, *supra* note 21 at 5.

<sup>24</sup> See e.g. Neil Reynolds, “What is the right size for nuclear power?”, *The Globe and Mail* (10 September 2012), online: *The Global and Mail* <<http://m.theglobeandmail.com/commentary/what-is-the-right-size-for-nuclear-power/article624254/?service=mobile>>.

<sup>25</sup> Citation of Duncan Hawthorne, President and Chief Executive Officer, Bruce Power in: The Standing Senate Committee on Energy, the Environment and Natural Resources, *Now or Never – Canada must act urgently to seize its Place in the new energy World Order* (Ottawa: 2012) at 63, n 76 [Standing Senate Committee – 2012].

<sup>26</sup> Bruce Power, “Bruce Power Alberta completes purchase of Energy Alberta Corp” (13 March 2008) [Bruce Power, 2008], online: Bruce Power <<http://www.brucepower.com/3740/news/news-archive-2008/bruce-power-alberta-completes-purchase-of-energy-alberta-corp/>>.

<sup>27</sup> WNA-CAN, *supra* note 18 at 6.

<sup>28</sup> Golder Associates Limited & SJ Research Services, *Report on Preliminary Economic and Financial Impact Analysis of a Proposed Nuclear Power Generation Facility in the Peace Country of Northern Alberta*, Report No 08-1334-0021 (July 2008) at 1 [Golder Associates]; Bruce Power, 2008, *supra* note 26.

the Canadian Nuclear Safety Commission (CNSC) staff under, *inter alia*, the *Nuclear Safety and Control Act* (NSCA).<sup>29</sup> Additionally, Bruce Power Alberta was required to submit a project description which was subject to the *Canadian Environmental Assessment Act* (CEAA (1992)).<sup>30</sup> On January 6, 2009 Bruce Power withdrew its application for the Lac Cardinal project because it identified another site at Whitemud, also situated in the Peace River area, which was assessed for its suitability. On December 12, 2011, Bruce Power, without giving reasons for its decision, announced that it would not proceed with the nuclear option in Alberta.<sup>31</sup>

Although there is currently no other plan to construct a nuclear power plant in Alberta, the oil industry still expresses interest in nuclear energy and considers nuclear to be a serious option, provided that nuclear technology will meet industry technical requirements, such as steam pressure, in the future.

### 1.1.2 Canada's Nuclear Policy

The Government of Alberta has announced that it will give nuclear power the same consideration as other energy options.<sup>32</sup> In 2007, the Canadian House of Commons Standing Committee on Natural Resources recommended that “no decision be made on using nuclear energy to extract oil from the tar sands until the repercussions of this process are fully known and understood.”<sup>33</sup> The Canadian government supported this view but stressed that the industry in cooperation with the provinces, according to the division of powers, will determine the best use of nuclear energy in order to extract oil from the oil sands.<sup>34</sup> The Committee's report assumes that a reactor of approximately 600 MWe capacity could supply a processing plant producing 60,000 barrels of synthetic crude oil per day.<sup>35</sup> It is estimated that about twenty of these reactors would be required by 2015 to meet the forecasted production needs of three million barrels per day.<sup>36</sup>

In 2012, the Standing Senate Committee on Energy, the Environment and Natural Resources stated that “nuclear energy should be part of Canada's energy future. The capacity of nuclear energy to produce large volumes of safe, reliable, and emission-free baseload electricity makes it an important element of Canada's efforts to reduce

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<sup>29</sup> SC 1997, c 9 [NSCA].

<sup>30</sup> The 2008 application was based on the old *Canadian Environmental Assessment Act*, SC 1992, c 37 [CEAA (1992)].

<sup>31</sup> Bruce Power, “Bruce Power will not proceed with nuclear option in Alberta” (12 December 2011), online: Bruce Power <<http://www.brucepower.com/4978/news/bruce-power-will-not-proceed-with-nuclear-option-in-alberta/>>. Bruce Power's reasons to not proceed with the nuclear option for the oil sands resulted from opposition from stakeholders in the Peace River area. The time period of ten years before a nuclear power plant could start to operate was considered as a hurdle. And finally, lack of financial support from the Federal and Alberta governments contributed to Bruce Power's decision to withdraw from the project.

<sup>32</sup> WNA-CAN, *supra* note 18 at 6.

<sup>33</sup> House of Commons, *supra* note 2 at 41.

<sup>34</sup> House of Commons, *ibid* at Recommendation 14.

<sup>35</sup> House of Commons, *ibid* at 41.

<sup>36</sup> House of Commons, *ibid* at 41.

emissions.”<sup>37</sup> The report concludes that the nuclear renaissance was deferred by the Fukushima accident but there are signs of revival.<sup>38</sup> Canada has a clear interest to place its nuclear technology, research and management expertise in a growing global market.<sup>39</sup> Also, increased global demand for uranium will provide economic benefits for Canada — which has the second largest uranium reserves in the world.<sup>40</sup>

## 1.2 The (Deferred) Nuclear Renaissance

Until 2001 things were quiet in the nuclear industry in the Western World.<sup>41</sup> Since then many countries have placed nuclear energy policies back on the agenda thus signaling an evolving “nuclear renaissance.”<sup>42</sup> This term refers to the anticipated nuclear power industry revival driven by elevated fossil fuel prices and worldwide efforts to reduce greenhouse gas emissions.<sup>43</sup> Allegedly the main reasons for the nuclear revival are, *inter alia*, increasing energy demand,<sup>44</sup> climate change,<sup>45</sup> economics<sup>46</sup> relating to increasing fossil

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<sup>37</sup> Standing Senate Committee – 2012, *supra* note 25 at 63.

<sup>38</sup> Standing Senate Committee – 2012, *ibid* at 18.

<sup>39</sup> Standing Senate Committee – 2012, *ibid* at 19.

<sup>40</sup> Standing Senate Committee – 2012, *ibid* at 19.

<sup>41</sup> According to the WNA the support of nuclear energy in the western world was significantly reduced as a consequence of the accidents at Three Mile Island and Chernobyl, and by nuclear power plant construction cost overruns in the 1970s and 1980s. WNA, Factsheet, “The Nuclear Renaissance” (2011) at 1 [WNA-NucRen], online: WNA <<http://www.world-nuclear.org/info/inf104.html>>.

<sup>42</sup> WNA-NucRen, *ibid* at 1.

<sup>43</sup> Standing Senate Committee – 2012, *supra* note 25 at 18.

<sup>44</sup> Energy demand results from global population growth and industrial development. According to estimates, the worldwide electricity consumption will double by 2030. Just to mention a few drivers for increasing energy demand beside the two previously mentioned: given the shortage of fresh water, there will be the need for “energy-intensive desalination plants, electric vehicle will increase overnight (base-load) demand, hydrogen production for transport purposes will require large amount of electricity and/or high temperature heat.” WNA-NucRen, *supra* note 41 at 1; Massachusetts Institute of Technology (MIT), *The Future of Nuclear Power* (Boston: MIT, 2003) at 1 [MIT 2003].

<sup>45</sup> John F Ahearne & Adolf Birkhofer, “Nuclear Power” in Jonathan B Wiener et al, eds, *The Reality of Precaution* (Washington, DC: RFF Press, 2011) 121 at 123. According to the WNA the consequences of global warming and climate change require a significant reduction in high-emission energy sources, such as fossil fuels and thus nuclear power is “the only readily available large-scale alternative to fossil fuels for production of continuous, reliable supply of electricity.” WNA-NucRen, *supra* note 41 at 2. Whether nuclear energy indeed has the potential to combat climate change is questioned by many authors. For example, Makhijani points out that nuclear energy, in order to make a significant contribution in combating climate change, had to increase significantly up to one-third or even one-half of the present energy mix which equals a number of 2,000 nuclear power plants globally (compared to 442 nuclear power plants globally at present). Such a huge amount of nuclear facilities then would result in difficulties regarding inspection, regulation, maintenance and decommissioning. (Arjun Makhijani, “Atomic Myths, Radioactive Realities: Why Nuclear Power Is a Poor Way to Meet Energy Needs” (2004) 1 J Land, Resources & Envtl L 61 at 66.)

<sup>46</sup> Increasing fossil fuel prices have paved the way to consider nuclear power as a supposedly cost-effective alternative. WNA-NucRen, *ibid* at 2. However, whether nuclear energy is really cost-effective compared to other energy sources seems to depend on the methodology of cost calculation. Crucial aspects

fuel prices, less price fluctuations in uranium, and security<sup>47</sup> of energy supply. However, nuclear energy generation is also associated with concerns about cost overruns,<sup>48</sup> nuclear weapons proliferation,<sup>49</sup> severe accidents,<sup>50</sup> nuclear waste management<sup>51</sup> and the risk of terrorist attacks.<sup>52</sup>

The nuclear renaissance found its temporary halt on March 11, 2011, when “Chernobyl” was replaced by Fukushima as the worst nuclear accident in the world’s history.<sup>53</sup> Two years after the Fukushima accident, it seems that the renaissance resumed. Governments of the major nuclear countries reviewed the safety standards of their nuclear

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are the costs for nuclear waste disposal and decommissioning of the facility. Whether these costs are also considered in the overall cost calculation or just treated as costs of different stages in the nuclear cycle which could arguably not belong to the actual energy production, would lead to significantly different results.

<sup>47</sup> Many countries fear interruptions in the delivery of fossil fuels based on the political situation in the country of delivery and the decrease of fossil fuels. The WNA points out that “[t]he abundance of naturally occurring uranium and the large energy yield from each tonne of it makes nuclear power attractive from an energy security standpoint.” WNA-NucRen, *ibid* at 2.

<sup>48</sup> With regard to high construction costs of nuclear power plants, see e.g. MIT 2003, *supra* note 44 at 37 & 38. A cost assessment should also take decommissioning costs of nuclear power plants into consideration. They will have to cover removing radioactive elements of the plant and premise, and the razing of the plant. Decommissioning costs are estimated to be over one billion dollars per nuclear plant financed by the utility customer. Joseph P Tomain & Richard D Cudahy, *Energy Law in a Nutshell* (St Paul, MN: Thomson West, 2004) at 324.

<sup>49</sup> Concerns are that “nuclear power technology has a large overlap with nuclear weapons technology. Nuclear power plants create weapons usable materials — plutonium in current designs.” Makhijani, *supra* note 45 at 65.

<sup>50</sup> See e.g. MIT 2003, *supra* note 44 at 2 & 9-10. Severe accidents in the past were: Three Mile Island, USA in 1979 and Chernobyl, Ukraine in 1986. See e.g. Jonathan Scurlock, “A Concise History of the Nuclear Industry Worldwide” in David Elliott, ed, *Nuclear or Not? Does Nuclear Have a Place in a Sustainable Energy Future?* (Basingstoke: Palgrave Macmillan, 2007) 24 at 30-32; Nuclear Power Expert Panel, *Report on Nuclear Power and Alberta* (Calgary: prepared for the Minister of Energy, February 2009) at 40-43. For an overview about accidents with CANDU reactors, see Mark Winfield et al, *Nuclear Power in Canada: An Examination of Risks, Impacts and Sustainability* (Drayton Valley: Pembina Institute, December 2006) at 75-78.

<sup>51</sup> Nuclear waste from mill tailings to spent fuel are highly radioactive and thus very long-lived. Nuclear waste has the potential to threaten essential natural resources, such as water quality. Makhijani, *supra* note 45 at 66. According to MIT: “The management and disposal of high-level radioactive spent fuel from the nuclear fuel cycle is one of the most intractable problems facing the nuclear power industry throughout the world. No country has yet successfully implemented a system for disposing of this waste.” MIT 2003, *supra* note 44 at 10; MIT, *Update of the MIT 2003: Future of Nuclear Power* (Boston: MIT, 2009) at 11.

<sup>52</sup> Makhijani, *ibid* at 65-66.

<sup>53</sup> The nuclear accident occurred on the east coast of Japan, at the island of Honshu, triggered by a major earthquake with a magnitude of 9.0 on the Richter scale, a tsunami and several subsequent earthquakes of significant magnitude. The force of nature in this dimension was not fully expected and poses a significant remaining risk from a nuclear technological perspective. Since the day of the disaster, the risk has become a reality. Several nuclear reactors have become inoperative, the important cooling systems no longer work, explosions have occurred. For detailed information regarding the nuclear incidents, see International Atomic Energy Agency (IAEA), “Fukushima Nuclear Accident Update Log”, online: IAEA <<http://www.iaea.org/newscenter/news/tsunamiupdate01.html>>.

fleet but eventually halted plans to construct new power plants are now moving ahead. On November 1, 2013, 435 nuclear reactors were in operation in 30 countries with an overall capacity of approximately 371 gigawatts electric (GWe), equaling approximately 15% of the world's electricity production.<sup>54</sup> Currently, China is building 28 new nuclear power plants. Other countries that commenced constructions of nuclear power plants are Russia, the Republic of Korea and the United Arab Emirates.<sup>55</sup>

## Part 2 The Canadian Nuclear Industry and the Nuclear Cycle

### 2.1 Canada's Nuclear Sector

In Canada, out of 22 commercial nuclear power reactors, distributed between five nuclear power plants, 17 are currently operating.<sup>56</sup> Two reactors are shut down and three are being refurbished. In Ontario, three nuclear power stations, Pickering,<sup>57</sup> Bruce,<sup>58</sup> and Darlington,<sup>59</sup> operate 20 reactors of which two are not operating.<sup>60</sup> In Quebec there is one reactor, Gentilly-2,<sup>61</sup> that is operating and in New Brunswick one reactor at Point Lepreau that is operating.<sup>62</sup> Nuclear energy has a 15% share in Canada's energy mix.<sup>63</sup> Canada ranks

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<sup>54</sup> IAEA, "The Database on Nuclear Power Reactors" [IAEA – Update], online: IAEA <<http://www.iaea.org/pris/>>. WNA, Factsheet, "Plans for New Reactors Worldwide" (2013) at 1, online: WNA <<http://www.world-nuclear.org/info/inf17.html>>. European Nuclear Society, "Nuclear Power Plants, Worldwide", online: European Nuclear Society <<http://www.euronuclear.org/info/encyclopedia/n/nuclear-power-plant-worldwide.htm>>.

<sup>55</sup> IAEA – Update, *ibid*.

<sup>56</sup> Additionally there are research reactors, e.g. AECL's Chalk River Laboratory, and others are situated at the McMaster University and the University of Alberta. Nuclear Power Expert Panel, *supra* note 50 at 26.

<sup>57</sup> Pickering was the first large-scale nuclear power plant. Pickering A went into service in 1971-1973 and consists of four reactors. Pickering B went into service in 1983-1986 with four reactors. Both Pickering A and B had a combined total capacity of 4,120 megawatts (MW). Two of the Pickering A units are not operated anymore. Winfield et al, *supra* note 50 at 14.

<sup>58</sup> The four Bruce A reactors, located in Tiverton, Ontario, went into service in 1977-1979; the four Bruce B units started in 1985-1987. The combined capacity of Bruce is 6,140 MW. Winfield et al, *ibid* at 14.

<sup>59</sup> Darlington consists of four reactors which entered into service in 1990-1993 and have a total capacity of 3,524 MW. Winfield et al, *ibid* at 14.

<sup>60</sup> Nuclear Power Expert Panel, *supra* note 50 at 26.

<sup>61</sup> Gentilly-2 nuclear station, situated near Bécancour, Quebec, has one reactor operating since 1983 with a capacity of 675 MW. Winfield et al, *supra* note 50 at 14.

<sup>62</sup> Winfield et al, *ibid* at 14; Nuclear Power Expert Panel, *supra* note 50 at 26. Point Lepreau, located north of the Bay of Fundy, went into service in 1983 and has a capacity of 635 MW.

<sup>63</sup> Ontario is the Canadian province with the highest consumption of nuclear energy which amounts to 40% of the province's total power. For information regarding the electricity generation mix in the Canadian provinces, see e.g.: Statistics Canada, *Energy Statistics Handbook – First Quarter 2012* (Ottawa: Minister of Industry, 2012).

seventh in terms of global nuclear power generation.<sup>64</sup> The Canadian nuclear industry generates over \$1.5 billion in federal and provincial revenues.<sup>65</sup>

Canada is a long-time international leader in nuclear energy research and the development of nuclear technology.<sup>66</sup> It has created its own line of nuclear power reactors based on a heavy water moderated nuclear reactor.<sup>67</sup> The first CANDU (Canada Deuterium Uranium) reactor was developed in the late 1950s.<sup>68</sup> All nuclear reactors in Canada are CANDU<sup>69</sup> reactors which use un-enriched uranium as fuel and heavy water (deuterium oxide) as a moderator and coolant.<sup>70</sup> The first commercial CANDU reactor started to operate in Pickering, Ontario in 1971.<sup>71</sup> Currently provinces and power companies are attempting to extend the operating life of some reactors by refurbishing them.<sup>72</sup> Refurbishment requires the replacement of fuel channels and steam generators and the upgrading of ancillary systems to current standards.<sup>73</sup> Although refurbishment was estimated to be less time intensive and less expensive compared to the construction of new nuclear power plants there have been several cost overruns which in some cases have equaled the estimated costs of new construction.<sup>74</sup>

For more than 25 years, no new nuclear power plants were built in Canada. However, Ontario Power Generation is going through the licensing process for the construction of a new plant at the Bowmanville site — which is the first and currently the only newly planned nuclear power plant in Canada.<sup>75</sup> Meanwhile, federal legislation, such as the *Nuclear Safety*

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<sup>64</sup> WNA, “Nuclear Share Figures 2002-2012” (2013), online: WNA <<http://www.world-nuclear.org/info/Facts-and-Figures/Nuclear-generation-by-country/>>.

<sup>65</sup> Natural Resources Canada, “The Canadian Nuclear Industry and its Economic Contributions”, online: Natural Resources Canada <<http://www.nrcan.gc.ca/energy/sources/uranium-nuclear/1526>>.

<sup>66</sup> The Standing Senate Committee on Energy, the Environment and Natural Resources made clear in its 2012 report that “a priority should be placed on developing emerging nuclear technologies.” Standing Senate Committee – 2012, *supra* note 25 at 63.

<sup>67</sup> WNA-CAN, *supra* note 18 at 1.

<sup>68</sup> WNA-CAN, *ibid* at 1.

<sup>69</sup> “CANDU reactors use heavy water (deuterium oxide) as a moderator and coolant, and are fueled using natural uranium (as opposed to enriched uranium). The advantages of the CANDU reactors are savings in fuel cost, because the uranium does not have to go through the enrichment process, and reduced reactor downtime from refueling and maintenance. These savings are partially offset by the cost of producing heavy water.” WNA-CAN, *ibid* at 1.

<sup>70</sup> Nuclear Power Expert Panel, *supra* note 50 at 26. It has to be noted that each type of reactor has a different impact, for instance on the environment and thus has to be dealt with differently within the regulatory process. An example here is the light water reactor. It relies on the enrichment of uranium fuel and thus produces a lower volume of spent fuel waste compared to CANDU reactors. However, light water reactors produce more greenhouse gases during the process of uranium enrichment. Winfield et al, *supra* note 50 at 20.

<sup>71</sup> WNA-CAN, *supra* note 18 at 2.

<sup>72</sup> WNA-CAN, *ibid* at 2.

<sup>73</sup> WNA-CAN, *ibid* at 2.

<sup>74</sup> WNA-CAN, *ibid* at 2.

<sup>75</sup> A review panel conducted an environmental impact assessment starting on 17 May 2007 and finished its work on 8 May 2012 (Canadian Environmental Assessment Registry: 07-05-29525). See online: CNSC

and Control Act (NSCA),<sup>76</sup> was enacted which redefines the terms of the licensing process and consequently might result in some uncertainty in the licensing process.

The major part of the licensing process falls within the exclusive authority of the federal government. Before the actual licensing process occurs there will be an environmental assessment of the prospective nuclear power project. Legal questions dealing with the licensing of nuclear power plants and environmental assessments (EA) may appear to be simple at a first glance. Experiences in other Canadian provinces may provide some guidance but the provincial governments have adopted different positions. The New Brunswick government has claimed jurisdiction over the EA process regarding nuclear facilities. For example, the first nuclear reactor at Point Lepreau, New Brunswick was subject to an environmental assessment in 1974-1975. The EA for the second reactor was subject to a panel review in 1985.<sup>77</sup> The EA review was a joint federal-provincial undertaking in order to assess the environmental and related social impacts of Lepreau II. The Panel had to make recommendations to both governments regarding the project's acceptability.<sup>78</sup>

The Ontario government does not conduct a provincial EA process for nuclear facilities.<sup>79</sup> In the case of the Ontario Power Generation Inc. proposal to construct and operate a new nuclear reactor at the Darlington Nuclear Generating Station Site, the Ontario government determined that it had no mandate under the Ontario *Environmental Assessment Act*<sup>80</sup> to carry out an environmental assessment.<sup>81</sup> It further indicated that clause 7(1) of the *Canada-Ontario Agreement for Environmental Assessment Cooperation*<sup>82</sup> was not triggered and requested simply that it be kept informed of any developments regarding the EA process.<sup>83</sup> Consequently the CNSC did not initiate a joint EA.<sup>84</sup> Instead there was

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<[http://www.nuclearsafety.gc.ca/eng/ea/completed/EA\\_07\\_05\\_29525.cfm](http://www.nuclearsafety.gc.ca/eng/ea/completed/EA_07_05_29525.cfm)>.

<sup>76</sup> NSCA, *supra* note 29.

<sup>77</sup> Province of New Brunswick & Government of Canada, *Second Nuclear Reactor Point Lepreau, New Brunswick: Report of the Environmental Assessment Panel* (Ottawa: Minister of Supply and Services Canada, 1985) at 5 [EA Report Lepreau II]. Regarding the nuclear history of New Brunswick, see e.g. Adrian Kelly Egbers, *Going Nuclear: The Origins of New Brunswick's Nuclear Industry, 1950-1983* (MA Thesis, Dalhousie University, 2008) (Proquest).

<sup>78</sup> Excluded from the Panel's mandate were the examination of power export from Lepreau II and the role of nuclear energy within the National Energy Policy. EA Report Lepreau II, *ibid* at 5-6.

<sup>79</sup> This was Ontario's position in the past and is still today. See e.g. John Swaigen & Ernest D Boyden, "Federal Regulation of Nuclear Facilities in Canada: Better Safe than Sorry" (1980-1981) 45 Sask L Rev 53 at 62.

<sup>80</sup> RSO 1990, c E-18.

<sup>81</sup> CNSC, Record of Proceedings, Including Reasons for Decision in the Matter of: Ontario Power Generation Inc (Applicant) in Environmental Assessment Referral Regarding Ontario Power Generation Inc's Proposal to Construct and Operate New Nuclear Reactors at the Darlington Nuclear Generating Station Site (Ottawa: CNSC, 2008) at para 19 [CNSC-Darlington].

<sup>82</sup> *Canada-Ontario Agreement for Environmental Assessment Cooperation* (2004), online: Ontario Ministry of the Environment <<http://www.ene.gov.on.ca/programs/4898e.pdf>>.

<sup>83</sup> CNSC-Darlington, *supra* note 81 at para 19.

<sup>84</sup> CNSC-Darlington, *ibid* at para 20.

a review of the project<sup>85</sup> under the CEAA (1992)<sup>86</sup> and NSCA.<sup>87</sup> The province also refused to assume responsibility for carrying out a provincial EA process, for Bruce Power Inc.'s earlier proposal to construct and operate a nuclear power generating station in Kincardine, Ontario.<sup>88</sup>

With respect to Alberta, there are no nuclear power plants.<sup>89</sup> Therefore the provincial government has no experience with nuclear technology or specific provincial legislation regarding nuclear facilities. But as history shows, the plans to use nuclear energy in Alberta for the oil sands originated in 1976 and re-emerged in 2009. The Province of Alberta might be faced again with considering the “nuclear option” and then be challenged by the licensing process of its first commercial nuclear power plant. The experience of other Canadian provinces with regards to the division of powers in environmental impact assessments of nuclear power plants shows a divided approach. Therefore, it is of relevance to consider the aspect of the division of powers in environmental impact assessments of nuclear power plants after several decades in which no nuclear power plant was licensed and before new and amended legislation.

## 2.2 The Nuclear Fuel Cycle<sup>90</sup>

The nuclear fuel cycle starts with locating and mining of uranium ore. The ore will be

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<sup>85</sup> SENES Consultants Limited, *Environmental Impact Statement New Nuclear – Darlington Environmental Assessment*, NK054-REP-07730-00029 (SENES, 30 September 2009) at ES-2.

<sup>86</sup> CEAA (1992), *supra* note 30.

<sup>87</sup> NSCA, *supra* note 29.

<sup>88</sup> Stanley David Berger, “Environmental Law Developments in Nuclear Energy” (2008) 1 Nuclear L Bull 55 at 62; CNSC, Environmental Assessment Referral regarding Bruce Power Inc's Proposal to Construct and Operate a Nuclear Power Generating Station in Kincardine, Ontario, CEA Registry No 07/05/25738 (reasons released 4 May 2007) (Ottawa: CNSC, 12 April 2007) at para 17.

<sup>89</sup> In Alberta there have been three nuclear facilities of which only one is still in operation: (1) The Earth Science Extraction Company, situated in Calgary, has an operating licence to recover high-grade uranium from fertilizer-grade phosphoric acid. In 1987 the company's plant was shut down and partially decommissioned. It no longer produces uranium. (2) In Fort McMurray, there exists a low-level waste disposal and uranium processing facility but it is not operating anymore. However, it is licensed as a standby facility. (3) The University of Alberta, Edmonton, operates a twenty-kW SLOWPOKE research reactor. For more information about the University of Alberta's research reactor, see the information at its homepage, online: <<http://www.ualberta.ca/~slowpoke/>>. Alberta Research Council & Idaho National Laboratory, *The Nuclear Energy Option in Alberta* (Edmonton: Report submitted to the Government of Alberta Nuclear Expert Panel, 2008) at 48 [Alberta Research Council].

<sup>90</sup> The nuclear fuel cycle refers to all activities associated with the production of electricity by nuclear reactions. MIT 2003, *supra* note 44 at 29; For more comprehensive descriptions, in particular regarding the technology applied in CANDU reactors, see Donald G Hurst et al, *Canada Enters the Nuclear Age: A Technical History of Atomic Energy of Canada Limited* (Montreal: McGill-Queen's University Press, 1997); WNA, Factsheet, “The Nuclear Fuel Cycle” (June 2012) [WNA-NucCycle], online: WNA <<http://www.world-nuclear.org/info/inf03.html>>.

milled into uranium oxide which is also referred to as “yellow cake”.<sup>91</sup>

The “yellow cake” is then converted into gaseous uranium hexafluoride. This gas is then subjected to an enrichment process which raises the concentration of uranium from U-238, a nonfissionable substance, to U-235, a uranium enriched isotope which is capable of causing a chain reaction. After enrichment, the enriched gas is returned to a solid state and is fashioned into pellets about the size of pencil erasers which are then fashioned into fuel rods used in reactors to create nuclear fission.<sup>92</sup>

Nuclear power can be generated either by fission or fusion. Today all commercial nuclear power stations use fission.<sup>93</sup> Briefly, fission is a chain reaction which splits the uranium nucleus and results in the release of energy (heat).<sup>94</sup> This heat is then used to generate steam to rotate turbines in order to generate electricity in a nuclear power plant.<sup>95</sup> From one tonne of natural uranium around 44 million kW/h of electricity may be generated whereas the same amount of electricity generated from fossil fuels would require 20,000 tonnes of black coal or 8.5 million cubic metres of gas.<sup>96</sup>

The negative environmental impacts from nuclear power plant operations include the generation of wastes such as nuclear fuel waste, radioactive wastes, toxic elements (lead, cadmium, mercury, chromium), hazardous wastes; atmospheric releases of air pollutants, such as radionuclides<sup>97</sup> and greenhouse gases, ammonia, hydrazine; water impacts, such as the routine and accidental release of radioactive pollutants, thermal impacts, cooling water effects on fish; occupational and community health impacts.<sup>98</sup> After 12 to 24 months of operations the concentration of fission fragments and heavy elements in the fuel will increase and thus make it impractical for continued use of the fuel.<sup>99</sup> The spent fuel will be removed from the reactor and emit radiation. It will be unloaded into storage ponds “adjacent to the reactor to allow the radiation levels to decrease.”<sup>100</sup> “In the ponds the water shields the radiation and absorbs the heat. Used fuel is held in such pools for several months

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<sup>91</sup> Tomain & Cudahy, *supra* note 48 at 300; WNA-NucCycle, *ibid* at 2.

<sup>92</sup> Tomain & Cudahy, *ibid* at 300-301. With respect to the enrichment process it has to be observed that CANDU reactors are specifically designed in such a way that they do not have to enrich uranium but instead can use naturally-occurring uranium.

<sup>93</sup> Tomain & Cudahy, *ibid* at 299.

<sup>94</sup> Tomain & Cudahy, *ibid* at 299. During a nuclear fission reaction, neutrons collide with atoms and cause them to split and thus release more neutrons. These neutrons will also collide with other atoms. Each splitting of atoms generates large amounts of heat. The heat then is used to generate steam to rotate turbines in order to generate electricity in a nuclear power plant.

<sup>95</sup> Winfield et al, *supra* note 50 at 20.

<sup>96</sup> WNA-NucCycle, *supra* note 90 at 4.

<sup>97</sup> Radionuclides generated by nuclear power facilities are gaseous radioactive emissions containing tritium oxide, noble gases, iodine-131, radioactive particulate, carbon-14. See the CNSC, “Radioactive Release Data from Nuclear Generating Stations”, online: CNSC <[http://www.cnsccsn.gc.ca/pubs\\_catalogue/uploads/INFO0210\\_R13\\_e.pdf](http://www.cnsccsn.gc.ca/pubs_catalogue/uploads/INFO0210_R13_e.pdf)>.

<sup>98</sup> Winfield et al, *supra* note 50 at 61-78.

<sup>99</sup> WNA-NucCycle, *supra* note 90 at 4.

<sup>100</sup> WNA-NucCycle, *ibid* at 4.

to several years. It may be transferred to ventilated dry storage on site.”<sup>101</sup> Alternatively, spent fuel may be shipped to a central storage facility. Finally, used fuel will either be reprocessed or prepared for permanent disposal.<sup>102</sup> One of the major challenges with nuclear energy today is the still unresolved issue of the lack of a long-term disposal facility in Canada for used fuel.<sup>103</sup>

## Part 3 Division of Powers with Regard to Nuclear Energy

This Part describes the division of powers regarding energy policies, energy generated from natural resources, in particular, nuclear energy, and considers the relevant legislation. Finally, this section of the paper explains the licensing process for Canadian nuclear power plants.

### 3.1 Power over Canadian Energy Policies

Currently the Electricity Resources Branch of Natural Resources Canada is responsible for the development of Canadian energy policies.<sup>104</sup> The Nuclear Energy Division, within the Electricity Resources Branch, determines and implements Canada’s nuclear energy

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<sup>101</sup> WNA-NucCycle, *ibid* at 4.

<sup>102</sup> Generally two different types of fuel cycles have to be distinguished: the open, also called once-through fuel cycle, where the spent fuel is discharged from the reactor and treated as waste. The closed fuel cycle reprocesses the spent fuel but generates high-level waste. (MIT 2003, *supra* note 44 at 29-35.) Used fuel consists of ~94% U-238, ~1% U-235 which did not fission, ~1% plutonium and 4.5% fission products which are highly radioactive. The reprocessing process separates the used fuel into its three components: uranium, plutonium and waste, which contains fission products. Reprocessing means the recycling of the uranium and plutonium into fresh fuel and thus produces a reduced amount of waste instead of disposing of all used fuel as waste. Reprocessed uranium, now containing a higher concentration of U-235 than naturally occurring uranium, can be reused as fuel after conversion and enrichment. Reprocessed plutonium can be directly mixed into mixed oxide (MOX) fuel and then used as reactor fuel. WNA-NucCycle, *ibid* at 4-5.

<sup>103</sup> According to the WNA, at present there is no disposal site. However, the WNA further concludes that on the other hand: “[t]here is currently no pressing technical need to establish such facilities, as the total volume of such wastes is relatively small. Further, the longer it is stored the easier it is to handle, due to the progressive diminution of radioactivity. There is also reluctance to dispose of used fuel because it represents a significant energy resource which could be reprocessed at a later date to allow recycling of the uranium and plutonium.” WNA-NucCycle, *ibid* at 5. This view seems to be beyond any reality. For problems with Canadian nuclear waste disposal, see Brenda L Murphy & Richard G Kuhn, “Setting the Terms of Reference in Environmental Assessments: Canadian Nuclear Fuel Waste Management” (2001) 27 *Can Pub Pol’y* 249-266; Darrin Durant & Genevieve Fuji Johnson, eds, *Nuclear Waste Management in Canada: Critical Issues, Critical Perspectives* (Vancouver: UBC Press, 2009). An illustrative example for difficulties with the search and determination of an appropriate disposal site can be found in the case of the storage site at Yucca Mountain, Nevada, USA. See Robert Resselar, “The Yucca Mountain Nuclear Waste Repository from a Federalism Perspective” (2003) 23 *J Land, Resources & Envtl L* 219-240.

<sup>104</sup> Gowling Lafleur Henderson LLP, *The Electricity Industry in Canada*, vol 1 (Toronto: Carswell, 2009) at 2-2 [*Electricity Industry in Canada*].

policy.<sup>105</sup> The *Department of Natural Resources Act* (DNRA)<sup>106</sup> in sections 5 and 6 assigns to the Minister of Natural Resources responsibilities with regard to energy and natural resources policies. Section 2 of the DNRA defines natural resources as mines, minerals and non-renewable resources, energy, including energy developed from water, and forest resources.

### 3.2 The Power to Regulate Energy Production

The constitutional authority to make laws for energy is specified in sections 91 and 92 of the *Constitution Act, 1867*<sup>107</sup> and section 92A of the *Constitution Act, 1982*.<sup>108</sup> Pursuant to section 92A(1) of the *Constitution Act, 1982*, “in each province, the legislature may exclusively make laws in relation to (a) exploration for non-renewable natural resources in the province; (b) development, conservation and management of non-renewable natural resources ...; and (c) development, conservation and management of sites and facilities in the province for the generation and production of electrical energy.” The generation and distribution of electrical power from hydro, oil, gas, coal or other non-nuclear sources, are considered to be “local works and undertakings” within the meaning of section 92(10) of the *Constitution Act, 1867*.<sup>109</sup> Generally, electricity generated from oil, gas, coal or other energy resources is subject to provincial powers pursuant to section 92A(1)(c) of the *Constitution Act, 1982*. Exceptions from that rule apply to nuclear power. Other provisions relevant to provincial jurisdiction are sections 92(13) and (16) of the *Constitution Act, 1867*.

### 3.3 Constitutional Jurisdiction over Nuclear Energy

In 1982, the Constitution was amended including the addition of section 92A.<sup>110</sup> This section confirms provincial legislative power over non-renewable resources.<sup>111</sup> The language of this section does make an exception for nuclear power. But the Supreme Court

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<sup>105</sup> *Electricity Industry in Canada*, *ibid* at 2-2 & 2-3.

<sup>106</sup> SC 1994, c 41 [DNRA].

<sup>107</sup> *Constitution Act, 1867* (UK), 30 & 31 Vict, c 3, reprinted in RSC 1985, App II, No 5 [*Constitution Act, 1867*].

<sup>108</sup> *Constitution Act*, being Schedule B to the *Canada Act 1982* (UK), 1982, c 11.

<sup>109</sup> *Electricity Industry in Canada*, *supra* note 104 at 1-1.

<sup>110</sup> *Electricity Industry in Canada*, *ibid* at I-1.

<sup>111</sup> On the historical development of federalism and natural resources, see Susan Blackman et al, “The Evolution of Federal/Provincial Relations in Natural Resources Management” (1994) 32 *Alta L Rev* 511-533. On the resource amendment in s 92A, see: William D Moull, “Natural Resources: Provincial Proprietary Rights, The Supreme Court of Canada, and the Resource Amendment to the Constitution” (1983) 21 *Alta L Rev* 472; Robert D Cairns, Marsha A Chandler & William D Moull, “The Resource Amendment (Section 92A) and the Political Economy of Canadian Federalism” (1985) 23 *Osgoode Hall LJ* 253; Robert D Cairns, Marsha A Chandler & William D Moull, “Constitutional Change and the Private Sector: the Case of the Resource Amendment” (1986) 24 *Osgoode Hall LJ* 299; William D Moull, “Natural Resources and Canadian Federalism: Reflections on a Turbulent Decade” (1987) 25 *Osgoode Hall LJ* 411.

of Canada has ruled that section 92A does not affect Parliament's declaration under section 92(10)(c) that nuclear plants are "works for the general advantage of Canada" and thus that their operation and management are within exclusive federal jurisdiction.<sup>112</sup> In *Ontario Hydro* the Court stated that the federal authority derives from the federal power to legislate for the peace, order and good government of Canada according to section 91 of the *Constitution Act, 1867* and the declaratory power under sections 91(29) and 92(10)(c) of the *Constitution Act, 1867*.<sup>113</sup> According to section 92(10)(c) of the *Constitution Act, 1867* the Parliament of Canada may, before or after execution of works and undertakings, declare them to be for the general advantage of Canada. As a consequence of such a declaration, any work subject to the declaration then falls within the legislative authority of the federal government, as if it was expressly listed in section 91 of the *Constitution Act, 1867*.<sup>114</sup> The declaratory power for nuclear energy was used in 1946 with the adoption of section 18 of the *Atomic Energy Control Act* (AECA)<sup>115</sup> which is now section 18 of the *Nuclear Energy Act* (NEA).<sup>116</sup> Section 18 of the NEA declares that nuclear energy is for the general advantage of Canada: "All works and undertakings constructed (a) for the production, use and application of nuclear energy, (b) for research or investigation with respect to nuclear energy, and (c) for the production, refining or treatment of nuclear substances, are, and each of them is declared to be, works or a work for the general advantage of Canada." Thus the federal Parliament has jurisdiction over a wide range of activities with regard to nuclear energy. This specifically includes uranium. Parliament's declaration in section 92(10)(c) incorporates uranium as a nuclear substance (s. 18(c) of the NEA in conjunction with s. 2 of the NSCA). Consequently, the federal government has jurisdiction over uranium as an exception to the general rule that provinces have jurisdiction over minerals.<sup>117</sup>

### 3.4 Nuclear Legislation

This subsection provides a brief overview of the developments in Canadian nuclear

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<sup>112</sup> *Ontario Hydro v Ontario (Labour Relations Board)*, [1993] 3 SCR 327 (SCC) at para 56 [*Ontario Hydro*]; *Energy Probe v Canada* (1994), 17 OR (3d) 717 (Ont Gen Div).

<sup>113</sup> *Ontario Hydro*, *ibid* at para 84.

<sup>114</sup> *Electricity Industry in Canada*, *supra* note 104 at I-5.

<sup>115</sup> SC 1946, c 37 [AECA].

<sup>116</sup> RSC 1985, c A-16 [NEA]. The constitutional validity of s 18, NEA was challenged but has been upheld by the Supreme Court of Canada (*Ontario Hydro*, *supra* note 112) which reasoned that the federal government had the authority to enact this provision based on its declaratory power according to s 92(10)(c) and the national concern branch of the peace, order and good government power.

<sup>117</sup> Consequently, production, refining and marketing of uranium falls within the federal jurisdiction. Peter W Hogg, *Constitutional Law of Canada*, 5<sup>th</sup> ed (Toronto: Carswell, 2011) at 30-5. See regarding uranium and the division of powers, Kevin Sproule, "The Uranium Mining Industry in Saskatchewan" (1978) 43 Sask L Rev 65 at 65-72; Margaret O'Donnell, "An Inquiry into Provincial Jurisdiction over Uranium Development in Saskatchewan" (1984) 48 Sask L Rev 293 at 293-295. For the constitutional validity of the NEAs predecessor the AECA, which established the declaration of general advantage for Canada regarding uranium: *Pronto Uranium Mines Ltd v Ontario Labour Relations Board et al*, [1956] 5 DLR (2d) 342 (Ont SC); *Denison Mines Ltd v Attorney-General of Canada* (1972), 32 DLR (3d) 419 (Ont HC).

legislation. The most important statutes in the nuclear area are the NSCA,<sup>118</sup> the NEA, the *Nuclear Liability Act*<sup>119</sup> and the *Nuclear Fuel Waste Act*.<sup>120</sup> Nuclear legislation started with the AECA<sup>121</sup> in 1946. The nuclear regulatory regime, in particular the Atomic Energy Control Board that was established under the AECA was criticized for “secrecy, unfettered government discretion, lack of public hearings, its inherent conflicts of interests, and for the domination of the ... Board by members of the nuclear industry and the exclusion from the Board of atomic energy workers and representatives of consumer and conservation groups.”<sup>122</sup> The AECA did not contain provisions for public hearings, social, technological, economic, or a formal environmental impact assessment before licensing nuclear facilities, although these assessments were often carried out in an informal process.<sup>123</sup> After decades of debating reform of the regulatory regime, in 1997 a new act was passed — the *Nuclear Safety and Control Act* (NSCA). The subsequent act incorporated most of the provisions from the AECA; and in section 89 of the NSCA, it renamed the AECA to the NEA which now consists of only a few provisions. The NEA is the successor to the AECA. The NSCA came into force on May 31, 2000. Therefore the change in the name of the AECA to NEA also came into force in the same year. The NSCA disconnects the former structure of the AECA being the regulatory and developmental aspects of nuclear activities.<sup>124</sup> Compared to the AECA, the NSCA has now shifted the main focus from national security (AECA) to the control of health, safety and environmental consequences of nuclear activities.<sup>125</sup> The Atomic Energy Control Board was replaced by the Canadian Nuclear Safety Commission (CNSC). Section 8 of the NSCA establishes the CNSC. The objective of the CNSC, pursuant to section 9(a)(i), is, *inter alia*, “to regulate the development, production and use of nuclear energy ... in order to prevent unreasonable risk, to the environment and to the health and safety of persons, associated with that development, production, possession or use ....” Thus “[t]he NSCA does not call for the elimination of all risks rather, it requires that the risks be acceptable, and defining this level of acceptable risk is one of the major tasks of the CNSC.”<sup>126</sup> The CNSC may designate an officer (Designated Officers)<sup>127</sup> and authorize that person, for example, to issue, renew, suspend, amend, revoke or replace a licence on receipt of an application.<sup>128</sup> Section 26(e) of the NSCA requires the proponent

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<sup>118</sup> NSCA, *supra* note 29.

<sup>119</sup> RSC 1985, c N-28.

<sup>120</sup> SC 2002, c 23.

<sup>121</sup> AECA, *supra* note 115.

<sup>122</sup> Swaigen & Boyden, *supra* note 79 at 55-56.

<sup>123</sup> Swaigen & Boyden, *ibid* at 55-56.

<sup>124</sup> NSCA, *supra* note 29 at Preamble.

<sup>125</sup> NSCA, *ibid* at Preamble. Section 3a of the NSCA describes the purpose of the NSCA as: the limitation, to a reasonable level and in a manner that is consistent with Canada’s international obligations, of the risks to national security, the health and safety of persons and the environment that are associated with the development, production and use of nuclear energy and the production, possession and use of nuclear substances, prescribed equipment and prescribed information.

<sup>126</sup> *Electricity Industry in Canada*, *supra* note 104 at 2-11.

<sup>127</sup> NSCA, *supra* note 29 at s 37(1).

<sup>128</sup> NSCA, *ibid* at ss 37(2)(c)-(d) & 24(2).

of a nuclear power station to hold a licence to prepare a site for, construct, operate, modify, decommission or abandon a nuclear facility.

### 3.5 Licensing Process<sup>129</sup> for New Nuclear Power Plants in Canada

As previously pointed out, the CNSC is the responsible authority for the issuance of licences for nuclear facilities. The CNSC is characterized as an independent federal regulator and a quasi-judicial administrative tribunal.<sup>130</sup> The CNSC consists of a Commission tribunal and staff organization. The Commission establishes regulatory policies with regard to health, safety, security and environmental matters; creates legally binding regulations; and decides on licensing based on laws and regulations.<sup>131</sup> The staff organization is responsible for reviewing licence applications with regard to regulatory requirements; making recommendations to the Commission; and enforcing compliance.<sup>132</sup> The Commission is authorized to set and enforce standards regarding health, safety, security and environmental protection related to nuclear energy.<sup>133</sup> The issuance of a licence requires that the applicant is qualified to carry out the proposed activity and can assure protection of the environment, health and safety of persons.<sup>134</sup> The decision to issue a licence requires the Commission to consider the applicant's request, recommendations from the CNSC staff, and any written or oral presentations from intervenors, including the public, made during public hearings.<sup>135</sup> The applicant has to comply with a variety of regulations and other legislation such as, but not limited to the NSCA,<sup>136</sup> the *Canadian Environmental Protection Act* (CEPA),<sup>137</sup> the *Canadian Environmental Assessment Act* (CEAA (2012)),<sup>138</sup> the *Fisheries Act*,<sup>139</sup> the *Species at Risk Act*,<sup>140</sup> the *Migratory Birds*

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<sup>129</sup> For an overview about the licensing process of nuclear power plants, see e.g. Alberta Research Council, *supra* note 89 at 104-108. A comparative review of the regulatory systems between Canada, France, Germany, Japan, Switzerland, UK and USA is offered in Alexandre Bredimas & William J Nuttall, "An International Comparison of Regulatory Organizations and Licensing Procedures for New Nuclear Power Plants" (2008) 36 *Energy Policy* 1344-1354.

<sup>130</sup> CNSC, *Licensing Process for New Nuclear Power Plants in Canada*, INFO-0756 (Revision 1) (Ottawa: CNSC, 2008) at 1 [CNSC, *Licensing Process*], online: CNSC <[http://nuclearsafety.gc.ca/pubs\\_catalogue/uploads/I0756\\_R1\\_e.pdf](http://nuclearsafety.gc.ca/pubs_catalogue/uploads/I0756_R1_e.pdf)>.

<sup>131</sup> CNSC, *Licensing Process*, *ibid* at 1.

<sup>132</sup> CNSC, *Licensing Process*, *ibid* at 1.

<sup>133</sup> NSCA, *supra* note 29 at s 20(2).

<sup>134</sup> NSCA, *ibid* at ss 26 & 24(4)(a)-(b).

<sup>135</sup> NSCA, *ibid* at s 40(5) in conjunction with the *CNSC Rules of Procedure*, SOR/2000-211 which, *inter alia*, set out the requirements for participation in public hearings.

<sup>136</sup> NSCA, *ibid*.

<sup>137</sup> SC 1999, c 33 [CEPA]. CEPA could be triggered, see part two of this paper.

<sup>138</sup> In 2012, CEAA (1992) was repealed and replaced by: *Canadian Environmental Assessment Act*, SC 2012, c 19, s 52 [CEAA (2012)].

<sup>139</sup> RSC 1985, c F-14. The *Fisheries Act* could be triggered, see part two of this paper.

<sup>140</sup> SC 2002, c 29.

*Convention Act*,<sup>141</sup> and the *Canada Water Act*.<sup>142</sup> The regulatory framework is technology-neutral, meaning that the CNSC cannot limit the choice of a specific reactor technology by regulations. Therefore, the applicant has to choose the nuclear technology and develop its corporate business plans and strategies.<sup>143</sup>

From a regulatory point of view, the nuclear life-cycle requires five licences for: (1) site preparation; (2) construction; (3) operation; (4) plant decommissioning; and (5) abandonment.<sup>144</sup> The information assessment carried out by CNSC considers the applicant's information and input from other federal and provincial government departments and agencies regarding health and safety, environmental protection, emergency preparedness and the transportation of dangerous goods.<sup>145</sup> Combined licences will not be issued but a parallel assessment for each licence is possible.<sup>146</sup> In addition to the five licences, an environmental assessment (EA) must be carried out in order to identify possible significant environmental effects. The CNSC estimates a total time period of 9 years from the receipt of the application to the issuance of the operating licence.<sup>147</sup>

## Part 4 Environmental Assessment of Nuclear Power Plants

The next part discusses the division of powers in Canada regarding the environment and environmental assessments of projects. After introducing the function and objectives of environmental assessments in general, I will examine the applicability of the federal and provincial environmental assessment processes with regard to nuclear power plants in Alberta and demonstrate that both federal and provincial EA processes are triggered at least once. When they are triggered, the next issue will be how to deal with the two EA processes.

### 4.1 Division of Powers — The Environment

The constitutional framework in Canada does not explicitly assign jurisdiction over the environment *sui generis* to the federal government or the provinces.<sup>148</sup> Instead, different aspects associated with the broad term environment fall within federal and/or provincial jurisdiction. Justice La Forest of the Supreme Court of Canada (SCC) pointed out in the *Friends of Oldman River Society v. Canada*:

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<sup>141</sup> SC 1994, c 22.

<sup>142</sup> RSC 1985, c C-11.

<sup>143</sup> CNSC, *Licensing Process*, *supra* note 130 at 3.

<sup>144</sup> CNSC, *Licensing Process*, *ibid* at 4.

<sup>145</sup> CNSC, *Licensing Process*, *ibid* at 4.

<sup>146</sup> CNSC, *Licensing Process*, *ibid* at 4.

<sup>147</sup> CNSC, *Licensing Process*, *ibid* at 13.

<sup>148</sup> *Friends of Oldman River Society v Canada*, [1992] 1 SCR 3 at para 85 [*Oldman River*]; Jamie Benidickson, *Environmental Law*, 4<sup>th</sup> ed (Toronto: Irwin Law, 2013) at 31.

The environment, as understood in its generic sense, encompasses the physical, economic and social environment touching several of the heads of power assigned to the respective levels of government. ... It must be recognized that the environment is not an independent matter of legislation under the *Constitution Act, 1867* and that it is a constitutionally abstruse matter which does not comfortably fit within the existing division of powers without considerable overlap and uncertainty.<sup>149</sup>

Pursuant to section 91(27) of the *Constitution Act, 1867* under the criminal law power, the federal government may regulate activities which could be harmful to the environment. In *Hydro-Québec*<sup>150</sup> the SCC relied on the criminal law power to uphold CEPA,<sup>151</sup> the most comprehensive federal act in Canadian environmental law.<sup>152</sup> Section 91(12) of the *Constitution Act, 1867* assigns power over fisheries to the federal government. Further, activities on federal public lands (s. 91(1A)) and federal works and undertakings including nuclear power fall within the federal power (s. 92(10)(c)).<sup>153</sup> From the emergency branch of the peace, order and good government power (POGG), incidents such as the escape of radioactive waste are covered.<sup>154</sup> Air and water pollution falls under POGG as confirmed in *Crown Zellerbach*<sup>155</sup> in which the SCC upheld a federal prohibition on dumping waste in waters within the province. Before the Supreme Court decision in *Crown Zellerbach*, the provinces claimed to have more power over the environment on their lands.<sup>156</sup> The SCC decision expanded the jurisdiction of the federal government with regard to the environment.<sup>157</sup> Doelle and Tollefson have noted that *Crown Zellerbach* prompted the federal government to undertake several legislative initiatives such as CEPA<sup>158</sup> in 1988 and CEEA (1992)<sup>159</sup> in 1992.<sup>160</sup> Despite strengthened federal power, the federal government has taken a rather conservative approach in making use of its expanded

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<sup>149</sup> *Oldman River*, *ibid* at para 86.

<sup>150</sup> *R v Hydro-Québec*, [1997] 3 SCR 213 [*Hydro-Québec*].

<sup>151</sup> CEPA, *supra* note 137.

<sup>152</sup> Hogg, *supra* note 117 at 30-20.

<sup>153</sup> Hogg, *ibid* at 30-21.

<sup>154</sup> Hogg, *ibid* at 30-21.

<sup>155</sup> *R v Crown Zellerbach*, [1988] 1 SCR 399 [*Crown Zellerbach*].

<sup>156</sup> Meinhard Doelle & Chris Tollefson, *Environmental Law Cases and Materials*, 2d ed (Toronto: Carswell, 2013) at 166-173.

<sup>157</sup> Doelle & Tollefson, *ibid* at 166-73.

<sup>158</sup> CEPA's purpose is to "identify, assess and control the use of substances that may pose a risk to human health and the environment." (Joseph F Castrilli, *Annotated Guide to the Canadian Environmental Protection Act* (Aurora: Canada Law Book, 2009) at I-1.) The current Act was composed of primarily four separate federal environmental laws, namely the *Environmental Contaminants Act* (RSC 1985, c E-12), the *Clean Air Act* (RSC 1985, c C-32), the *Ocean Dumping Control Act* (RSC 1985, c O-2) and the *Canada Water Act* (*supra* note 142). These laws dealt with toxic chemicals, air pollution, marine pollution and water pollution from nutrients. When the predecessor of CEPA 1999, namely CEPA 1988, was enacted and came into force, these Acts were repealed but their core elements still exist in CEPA 1999 (Castrilli, *ibid* at I-1).

<sup>159</sup> CEEA (1992), *supra* note 30.

<sup>160</sup> Doelle & Tollefson, *supra* note 156 at 166-173.

environmental power.<sup>161</sup> An explanation for this can be found in the highly protective behavior of the provinces with regard to jurisdiction over provincial natural resources.<sup>162</sup>

The SCC decision in *Oldman River* also dealt with the authority to conduct an environmental assessment,<sup>163</sup> under the *Environmental Assessment and Review Process Guideline Order*.<sup>164</sup> An environmental group in Alberta tried to compel two federal departments, namely the Department of Transport and the Department of Fisheries and Oceans, to conduct a federal environmental assessment of a dam constructed on the Oldman River by the Government of Alberta.<sup>165</sup> The SCC ruled that the environmental assessment processes are connected to the respective area in which the federal government has jurisdiction.<sup>166</sup> Justice La Forest pointed out that an environmental impact assessment is auxiliary in its nature and therefore could only affect matters that fall within the (federal) legislative jurisdiction.<sup>167</sup> However:

[t]he scope of assessment is not confined to the particular head of power under which the Government of Canada has a decision-making responsibility. ... Such a responsibility ... is a necessary condition to engage the process, but once the initiating department has thus been given authority to embark on an assessment, that review must consider the environmental effect on all areas of federal jurisdiction. There is no constitutional obstacle preventing Parliament from enacting legislation under several heads of power at the same time.<sup>168</sup>

Section 92(13) of the *Constitution Act, 1867* gives the provinces jurisdiction over property and civil rights. This section provides the authority to, *inter alia*, regulate land use and most aspects of mining including uranium ore.<sup>169</sup> Additionally, section 92(16) of the *Constitution Act, 1867* provides the provinces with the jurisdiction to make laws for all matters of a merely local or private nature in the province. Further, the provinces have the power over the management and sale of the public lands belonging to the provinces and of the timber and wood thereon (s. 92(5) of the *Constitution Act, 1867*). Local works and undertakings are pursuant to section 92(10) of the *Constitution Act, 1867* assigned to the

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<sup>161</sup> Doelle & Tollefson, *ibid* at 166-173.

<sup>162</sup> Doelle & Tollefson, *ibid* at 166-173.

<sup>163</sup> Meinhard Doelle, *The Federal Environmental Assessment Process: A Guide and Critique* (Markham: LexisNexis 2008) at 63.

<sup>164</sup> SOR/84-467 was the predecessor of CEAA and is not in force anymore. *Oldman River*, *supra* note 148 at paras 2 & 3.

<sup>165</sup> *Oldman River*, *ibid* at para 3.

<sup>166</sup> *Oldman River*, *ibid* at para 48.

<sup>167</sup> *Oldman River*, *ibid* at para 97. According to Hogg, the Constitution of Canada does not acknowledge an ancillary power in the enumerated powers (Hogg, *supra* note 117 at 15-39). However, some court decisions ogled with the idea of ancillary power (examples are: *Grand Trunk Ry v AG Can*, [1907] AC 65, 68; *R v Thomas Fuller Construction*, [1980] 1 SCR 695, 713; *Fowler v R*, [1980] 2 SCR 213, 224, 226; *Regional Municipality of Peel v MacKenzie*, [1982] 2 SCR 9, 18). As mentioned earlier in *Oldman River* (at para 97), the court ruled that environmental impact assessment is auxiliary in its nature and therefore can only affect matters that fall within the (federal) legislative jurisdiction.

<sup>168</sup> *Oldman River*, *ibid* at para 149.

<sup>169</sup> Hogg, *supra* note 117 at 30-24.

jurisdiction of the provinces. As already indicated in the previous part of this paper, according to section 92A of the *Constitution Act, 1982*, the provinces have the authority over their non-renewable natural resources. Jamie Benidickson has noted that these legislative powers provide the provinces “with a strong constitutional basis for the extensive range of regulatory initiatives each has taken in relation to environmental protection.”<sup>170</sup>

## 4.2 Environmental Assessment<sup>171</sup>

“The growth of modern societies has shown the serious problems that can result from anarchic development and use of land, in particular those problems concerning public health and the environment.”<sup>172</sup> In *Oldman River*,<sup>173</sup> Justice La Forest wrote: “Environmental impact assessment is, in its simplest form, a planning tool that is now generally regarded as an integral component of sound decision making. ... As a planning tool it has both an information-gathering and decision making component which provides the decision maker with an objective basis for granting or denying approval for a proposed development.”<sup>174</sup> Others have noted that the term can be interpreted differently regarding its content, meaning and importance within the regulatory process.<sup>175</sup>

## 4.3 Federal Environmental Assessment — CEAA

This paper was prepared during the adoption of a new *Canadian Environmental Assessment Act*.<sup>176</sup> It is not intended to present a complete overview of all the significant changes in CEAA. Rather, this paper examines only the relevant parts of CEAA (2012) for future nuclear power plants.

### 4.3.1 Objective

The federal environmental assessment process under section 4 of CEAA (2012) sets out a

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<sup>170</sup> Benidickson, *supra* note 148 at 39.

<sup>171</sup> The general history and development of Canadian environmental assessment is not the subject of this paper. An overview about the history is presented in Robert B Gibson & Kevin S Hanna, “Progress and Uncertainty: The Evolution of Federal Environmental Assessment in Canada” in Kevin S Hanna, ed, *Environmental Impact Assessment Practice and Participation* (Don Mills: Oxford University Press, 2009) at 18-36.

<sup>172</sup> *R v Al Klippert Ltd*, [1998] 1 SCR 737 (SCC) at para 16.

<sup>173</sup> *Oldman River*, *supra* note 148.

<sup>174</sup> *Oldman River*, *ibid* at 95.

<sup>175</sup> See Benidickson, *supra* note 148 at 254-255; Kevin S Hanna, “Environmental Impact Assessment: Process, Setting, and Efficacy” in Hanna, *supra* note 171 at 3; Doelle, *supra* note 163 at 17.

<sup>176</sup> CEAA (2012), *supra* note 138. For more information, see e.g. Allan Ingelson, Alastair Lucas & Nickie Vlavianos, “Significant Changes to the Canadian EA Process” (Paper presented at the 33<sup>rd</sup> Annual Conference of the International Association of Impact Assessments, *Impact Assessment: The Next Generation*, Calgary, Alberta, 16 May 2013).

range of objectives, *inter alia*, that projects have to be considered in a precautionary manner in order to avoid significant adverse environmental effects;<sup>177</sup> and to promote sustainable development and maintain a healthy environment and a healthy economy.<sup>178</sup> This catalogue reads as an ideal approach to environmental assessments. The Federal Court suggests that this provision is a “statement of general principle” and is not legally binding.<sup>179</sup>

### 4.3.2 CEAA Trigger

CEAA (2012) has adopted a completely different trigger mechanism. Now projects must be registered as a designated project if listed in the *Regulations Designating Physical Activities*.<sup>180</sup>

#### 4.3.2.1 Who is Responsible to Carry Out the EA?

CEAA (2012) assigns the EA process to three main agencies which are the Canadian Environmental Assessment Agency (CEA Agency), the National Energy Board (NEB) and the Canadian Nuclear Safety Commission (CNSC).<sup>181</sup> The CNSC is responsible to assess nuclear projects and other EAs are now carried out by the CEA Agency not under the authority of the NEB.<sup>182</sup>

The CEAA (1992) relied on a self-assessment EA process which means that “the federal decision maker itself was asked to oversee the gathering of information about the broader environmental implications of its decision, and the evaluation of the information gathered, rather than a more independent agency.”<sup>183</sup> This approach of self-assessment for the most part has now been abolished, except for the NEB and CNSC which will continue with a self-assessment process. Meinhard Doelle has criticized adherence to the self-assessment based on extensive experience that:

regulatory agencies are more focused on technical issues, and less interested in the big picture planning issues so fundamental to effective EA. There are also legitimate concerns that some regulators may be captured by their industry, making it difficult for them to consider whether the industry sector they regulate offers the most sustainable long-term solution to the need or purpose

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<sup>177</sup> CEAA (2012), *ibid* at ss 4(a)-(b).

<sup>178</sup> CEAA (2012), *ibid* at s 4(h).

<sup>179</sup> *Environmental Resource Centre v Canada (Minister of Environment)*, 2001 FCT 1423, 214 FTR 94 at para 141.

<sup>180</sup> SOR/2012-147, am by the *Regulations Amending the Regulations Designating Physical Activities*, Public Notice, 24 October 2013, online: CEA Agency <<http://www.ceaa-acee.gc.ca/default.asp?lang=en&xml=0DDF9560-6A8A-4403-B33A-B906AC6A1D93>>.

<sup>181</sup> CEAA (2012), *supra* note 138 at s 15.

<sup>182</sup> Under the old CEAA, many federal decision makers were involved or responsible for carrying out an EA process.

<sup>183</sup> Meinhard Doelle, “CEAA 2012: The End of Federal EA as we know it?” (2012) 24 JELP 1 at 5 [Doelle, “CEAA 2012”].

being pursued with the proposed project. Furthermore, the perception of capture tends to undermine the credibility of the EA process to the general public. It is curious, then, that while CEAA 2012 generally signals an abandonment of the self-assessment experiment, which clearly had been unsuccessful under CEAA 1995, it allows the NEB and the CNSC to continue to play a self-assessment role.<sup>184</sup>

#### 4.3.2.2 Designated Physical Activity

Pursuant to section 2(1), CEAA (2012), a designated physical activity, is now defined as “one or more physical activities that:

- (a) are carried out in Canada or on federal lands;
- (b) are designated by regulations made under paragraph 84(a) or designated in an order made by the Minister under subsection 14(2); and
- (c) are linked to the same federal authority as specified in those regulations or that order. It includes any physical activity that is incidental to those physical activities. The project must be registered and thus becomes a designated project.

Section 13 of CEAA (2012) provides that a designated project for which the responsible authority is, for example, the CNSC, is subject to an environmental assessment. Section 15(a) of CEAA (2012) further specifies with respect to the CNSC as a responsible authority that the designated project must include activities that are regulated under the NSCA and that they are linked to the CNSC.

Physical activities that are set out in the schedule of the *Regulations Designating Physical Activities* are designated projects. Activities set out in items 31 to 38 of the schedule are linked to the CNSC when they are regulated under the NSCA.<sup>185</sup> Under item 35 of the schedule under the *Regulations Designating Physical Activities* a designated activity includes the construction, operation, and decommissioning of a new nuclear fission or fusion reactor. Item 36 designates the expansion of an existing nuclear fission or fusion reactor that would result in an increase in power output of 50% or more as a physical activity.

#### 4.3.2.3 EA Process — Standard EA for Nuclear Activities

The screening and comprehensive studies under the former Act (CEAA 1992) are merged into one EA process with a very narrow scope.<sup>186</sup> Panel reviews are conducted under different rules. Mediation is eliminated. Doelle notes that “the scope of the federal assessment has been significantly narrowed, from a generally inclusive approach that tried to look at a broad range of adverse environmental effects of proposed projects to one that is focused on a few issues within the direct regulatory authority of the federal

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<sup>184</sup> Doelle, “CEAA 2012”, *ibid* at 5.

<sup>185</sup> *Regulations Designating Physical Activities*, *supra* note 180, s 4(2).

<sup>186</sup> Doelle, “CEAA 2012”, *supra* note 183 at 4.

government.”<sup>187</sup> In other words, under CEAA (2012) there is a standard EA and a panel review.

CEAA (2012) does not set out the exact EA procedure.<sup>188</sup> However, it must be stressed that within the nuclear context and the responsibility of the CNSC, a panel review is now prohibited.<sup>189</sup> The reason for exemption from a panel review in nuclear matters is that the regulatory process of the CNSC and its public hearings are deemed to be sufficient to serve the CEAA (2012) objectives.<sup>190</sup> A more important conclusion is that the CNSC still must carry out EA processes for the construction of proposed nuclear power plants. Under CEAA (2012) the scope of EAs is narrower than under the former CEAA (1992) due to different definitions of environmental effect and the factors to be considered.<sup>191</sup> Environmental effects are defined in section 5 of the CEAA (2012).

#### 4.3.2.4 Substitution — MOU 2011

On March 1, 2011, the CNSC and the Government of Canada, represented by the Minister of the Environment, entered into a “Memorandum of Understanding (MOU) on the Substitution of the Environmental Assessment Process followed by the Canadian Nuclear Safety Commission for an Environmental Assessment by a Review Panel under the *Canadian Environmental Assessment Act*.”<sup>192</sup> The MOU should be void now because there are no panel reviews in the nuclear area anymore and thus no substitution for CNSC EAs under CEAA (2012).<sup>193</sup>

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<sup>187</sup> Doelle, “CEAA 2012”, *ibid* at 4.

<sup>188</sup> For a description about the current EA processes under CEAA, see Doelle, “CEAA 2012”, *ibid* 183 at 7-10.

<sup>189</sup> CEAA (2012), *supra* note 138, s 38(6) in conjunction with s 15(a).

<sup>190</sup> Doelle, “CEAA 2012”, *supra* note 183 at 9. Doelle also comments that “this does not mean that the NEB and CNSC are well suited as regulators to engage the public in a true planning process that considers whether the proposed project is the most appropriate way to meet societal needs and how its contribution to sustainability can be maximized.”

<sup>191</sup> Doelle, “CEAA 2012”, *ibid* at 11.

<sup>192</sup> CNSC, “Memorandum of Understanding (MOU) on the Substitution of the Environmental Assessment Process followed by the Canadian Nuclear Safety Commission for an Environmental Assessment by a Review Panel under the *Canadian Environmental Assessment Act*” between the Minister of the Environment and the CNSC (1 March 2011). The old CEAA and MOU set out that if the project is referred to a panel review than according to this MOU the CNSC’s public hearing and licensing process under the NSCA qualifies to completely substitute an assessment by a review panel under the CEAA. However, the CNSC has to inform the Minister of the Environment of its intention to substitute the process and the Minister has to agree upon that.

<sup>193</sup> See also Doelle, “CEAA 2012”, *supra* note 183 at 14.

## 4.4 Alberta's Environmental Assessment — EPEA

### 4.4.1 Objective

Alberta's environmental assessment process is outlined in Part 2 of the *Environmental Protection and Enhancement Act* (EPEA)<sup>194</sup> and relevant regulations, notably the *Activities Designation Regulation* (ADR)<sup>195</sup> and the *Environmental Assessment (Mandatory and Exempted Activities) Regulation (Mandatory Activities Regulation)*.<sup>196</sup> In general, the purpose of the Act, pursuant to section 2, is to support and promote the protection, enhancement and wise use of the environment while recognizing, *inter alia*, (a) the protection of the environment, (b) the need for Alberta's economic growth and prosperity in an environmentally responsible manner, and (c) the principle of sustainable development. The purposes section of the Act clearly emphasizes and requires economical compatibility of environmental decisions. Part 2, Division 1 of EPEA sets out the actual environmental assessment process.<sup>197</sup> Part 2 also contains its own description of purposes in section 40 (which more or less repeats section 2 of EPEA) but stresses again the importance of both the environment and the economy, which seem to receive the same importance in the assessment process.<sup>198</sup> However, section 40(c) of EPEA brings in a new aspect, that the EA process is also designed to predict not only the environmental, but also the social, economic and cultural consequences of a proposed activity and to assess plans to mitigate any adverse impacts resulting from the proposed activity.

### 4.4.2 When is the Provincial EA Process Triggered under EPEA?

There are three options for undertaking an EA process under section 44. First, pursuant to section 41 of the EPEA, any Director (Director of Approvals)<sup>199</sup> who is of the opinion that the potential environmental impacts of a proposed activity warrant further consideration under an EA, may refer the proponent or the proposed activity to (another) Director (Environmental Assessment Director)<sup>200</sup> who is designated for the purposes of sections 43 to 56 of the EPEA, so that the proposed activity may be dealt with under section 44 of the

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<sup>194</sup> RSA 2000, c E-12 [EPEA].

<sup>195</sup> Alta Reg 276/2003 [ADR].

<sup>196</sup> Alta Reg 111/1993.

<sup>197</sup> For a general overview about the stages and the process of environmental assessments pursuant to EPEA, see e.g. Roger Creasey & Kevin Hanna, "Alberta: Environmental Impact Assessment in a Rapid Growth Setting" in Hanna, *supra* note 171 at 325-330.

<sup>198</sup> Section 40(b) sets out that the purpose of an environmental assessment is: to integrate environmental protection and economic decisions at the earliest stages of planning an activity and thus is similar to s 2(b), EPEA, *supra* note 194.

<sup>199</sup> The term "Approvals Director" is created by the Government of Alberta but is not an official term in the EPEA. Government of Alberta, *Environmental Assessment Program* (February 2010) at 2 [GoA, EA Program], online: Government of Alberta <<http://environment.gov.ab.ca/info/library/6964.pdf>>.

<sup>200</sup> The term "Environmental Assessment Director" is created by the Government of Alberta but is not an official term in EPEA. GoA, EA Program, *ibid*.

EPEA. The second option refers to section 43 of the EPEA. When the Environmental Assessment (EA) Director is of the opinion that the potential environmental impacts of a proposed activity warrant further consideration under the environmental assessment process, he or she may advise the proponent that the proposed activity must be dealt with under section 44 of the EPEA. Thirdly, the proponent may contact and consult with the EA Director in respect to the application of the EA provisions.

The definition of a proposed activity in sections 39(e) and 2(n) of the Schedule of Activities of the EPEA provides four options. In the case of the construction of a nuclear power plant, alternative (i) of section 39(e), meaning an activity that has not been commenced, applies. When a proposed activity is referred to the EA Director, he or she must direct the proponent to prepare and submit an environmental impact assessment report if the proposed activity is a mandatory activity within the meaning of section 44(1) of the EPEA in conjunction with the *Mandatory Activities Regulation*. This Regulation distinguishes between mandatory activities and exempted activities. Pursuant to section 1 of the *Mandatory Activities Regulation*, a proposed activity which is listed in the Regulations Schedule 1 that has not been commenced is designated as a mandatory activity for the purposes of the EPEA and thus requires the conduct of an environmental assessment. If the activity is not mandatory the Director still has the discretion to require further consideration and assessment of the activity (ss. 44(1)(b) to 46 of the EPEA). In other words, even exempted activities can trigger an EA process under EPEA if the Director exercises her or his discretion.<sup>201</sup> Furthermore, activities which are not specifically listed in the *Mandatory Activities Regulation* are discretionary. These activities may also trigger an EA.<sup>202</sup> However, the focus of the following analysis will be on mandatory activities because they require an EA.

#### 4.4.2.1 Thermal Electrical Power Generating Plant

Schedule 1(k) of the *Mandatory Activities Regulation* enumerates as a mandatory activity the construction of a thermal electrical power generating plant that uses non-gaseous fuel and has a capacity of 100 MW (megawatts) or greater. If the proposed nuclear power plant in Alberta falls under these criteria, it would qualify as a mandatory activity which results in a mandatory environmental assessment. The proposed nuclear power plant is a thermal electrical power plant because the reactor type (CANDU) generates steam for bitumen

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<sup>201</sup> See also GoA, EA Program, *ibid* at 2.

<sup>202</sup> Discretionary activities may trigger an EA if: “1. Another Alberta Environment Director, usually the Approvals Director, refers the project to the Environmental Assessment Director for consideration; 2. The Proponent requests the Environmental Assessment Director make a decision on the need for an EIA report; or 3. The Environmental Assessment Director decides that an EIA report may be required. 4. The Minister may order an EIA report be prepared.” GoA, EA Program, *ibid* at 2.

extraction and electricity.<sup>203</sup> The proposed power plant would use non-gaseous<sup>204</sup> fuel, uranium pellets (yellowcake). The proposed capacity cannot be finally determined, yet. However, the project proponent Bruce Power Alberta proposed construction of two to four reactors with an overall capacity of 4000 MW.<sup>205</sup> This significantly exceeds the threshold of 100 MW as set out in Schedule 1(k). Therefore, the language indicates that the proposed nuclear power plant is a mandatory activity to which section 44(1)(a) of the EPEA applies.

The next part of this paper deals with water use as a mandatory activity. Then both aspects from the analysis are considered in light of constitutional doctrines and relevant case law in order to define the scope of the exclusive federal power over nuclear energy.

#### 4.4.2.2 Water Use under EPEA

The next option for environmental assessment of a nuclear project as a mandatory activity, relates to water use in an Alberta nuclear power plant. Therefore I will briefly provide an overview of water use in an Alberta nuclear power plant and then continue with the legal analysis of Schedule 1(d) of the *Mandatory Activities Regulation* and sections 16 and 49 of the *Alberta Water Act*.<sup>206</sup> Water use in nuclear and fossil-fuelled power plants is not fundamentally different.<sup>207</sup> Apart from the technical processing of water in a nuclear power

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<sup>203</sup> “In Candu reactors, heat is produced by the fission of natural uranium fuel. Heavy water (deuterium oxide) under pressure carries the heat to the steam generators, and is then pumped back to the reactor core. In the steam generators the heat is transferred to ordinary light water, which is turned into steam. The steam drives turbines, which in turn drive electrical generators.” EA Report Lepreau II, *supra* note 77 at 5. For the use of steam and electricity, see also part one of the paper.

<sup>204</sup> The word gaseous is described as “of the nature or form of a gas; involving or relating to a gas or gases”. *Shorter Oxford English Dictionary on Historical Principles*, 6<sup>th</sup> ed, *sub verbo* “gaseous”. Consequently, non-gaseous means the opposite.

<sup>205</sup> Bruce Power, 2008, *supra* note 26.

<sup>206</sup> RSA 2000, c W-3.

<sup>207</sup> “Similarities include the following: water is used in the primary coolant and the steam generator, water is recycled except for heat transfer to the environment, and water brought into the plant is thoroughly cleaned to prevent plant corrosion problems. There are two minor differences. Because current nuclear power plants have slightly lower thermal efficiency than fossil-fuelled plants, they must transfer slightly more heat to the environment and therefore slightly more water is lost .... Second, a nuclear power plant uses a small amount of water to cool used fuel that has been discharged from the reactor. The two major uses are the two major coolant systems: the primary coolant and heat rejection to the environment. The primary coolant removes heat from wherever the fuel is reacting, whether it is uranium, coal, oil, or natural gas, and transfers it to steam turbines to generate electricity. ... In pressurized-water reactors, the primary coolant is kept sealed and away from the steam turbines; instead heat is first transferred to a secondary coolant, which then goes to steam turbines. Most nuclear reactors use water as the primary coolant ....” (Alberta Research Council, *supra* note 89 at 72). “Once-through cooling uses water only once as it passes through a condenser to absorb heat. Intermittently, chlorine is added to control microbes that corrode the piping and diminish the cooling capacity. This heated treated water is then discharged downstream from the intake into a receiving water body (usually, but not always, the original water source). While there is little water consumption with once-through systems, there are severe impacts to aquatic life as a result of water intake (entrainment and impingement) and water discharge (increased water temperature and added chlorine). Once-through cooling is the most common technology in use nationwide [referring to the US], representing about 52% of

plant, the use of water can be divided into three major stages. The first stage is the water intake from a water body. The second stage is the use of the water inside the nuclear power plant. The third and final stage is the discharge of the used water into a water body. In the following description I will use the term “water use” and refer to all three stages. Otherwise I will specify the stage.

The use of water may require performing a provincial environmental assessment. Two options have to be discussed here. Stages within the use of water could qualify as a mandatory activity under Schedule 1(d) of the *Mandatory Activities Regulation* which is the case for construction or operation of a water diversion structure and canals with a capacity greater than fifteen cubic metres per second. The second option to trigger an EA under the EPEA arises pursuant to sections 16(1) and 49 of the Alberta *Water Act* in conjunction with Part 2, Division 1 (Environmental Assessment) of the EPEA. Unless otherwise authorized by the *Water Act*, diversion of water requires a licence pursuant to section 49 of the *Water Act*. The term “diversion of water” means, *inter alia*, taking or removal of water for any purpose, as defined in section 1(1)(m) of the *Water Act*. In other words, in order to remove water and discharge the water necessary for the operation of a nuclear power plant, the operator has to obtain a provincial licence. Pursuant to section 16(1) of the *Water Act*, the Director may not issue or amend an approval, preliminary certificate or licence or approve a transfer of an allocation of water under a licence if the Director is of the opinion that Part 2, Division 1 of the EPEA has not been complied with. According to section 16(2) of the *Water Act* the Director may, notwithstanding subsection (1), issue an approval, preliminary certificate or licence to enable a proponent to comply with Part 2, Division 1 of the EPEA. If parts of the water use are mandatory activities then an EA process has to be carried out. If not, a discretionary EA might be carried out. The next section of this paper will examine whether water use for an Alberta nuclear power plant falls under the *Mandatory Activities Regulation*.

#### 4.4.2.2.1 Water Diversion — Water Intake

The water intake structure of a nuclear power plant could be a mandatory activity. According to Schedule 1(d) of the *Mandatory Activities Regulation* the construction or operation of a water diversion structure and canals with a capacity greater than fifteen cubic metres per second are mandatory activities. Power plants in general use cooling water intake structures. The term “water diversion structure” is not defined in EPEA. But according to the section 1(1)(m)(i) definition in the *Water Act* along with the principle of *in pari materia*, the diversion of water also means taking of water. Therefore, it is assumed that a water intake structure qualifies as a water diversion structure. For an 800 MW nuclear power plant, using the once-through water cycle, the annual water withdrawal is calculated

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generation.” (Ellen Baum, *Wounded Waters: The Hidden Side of Power Plant Pollution* (2004) at 2, online: <[http://www.catf.us/resources/publications/files/Wounded\\_Waters.pdf](http://www.catf.us/resources/publications/files/Wounded_Waters.pdf)>.)

to be from 600,000,000 to 1,400,000,000 cubic metres per year.<sup>208</sup> The lowest water withdrawal estimate of 600,000,000 cubic metres equals a withdrawal of 19.025 cubic metres per second. Converting the example of an 800 MW plant, to the values which would apply to a 4000 MW nuclear power plant, the water withdrawal would amount to 95.129 cubic metres per second. Therefore it can be assumed that the water intake structure will exceed the threshold set out in the *Mandatory Activities Regulation*. According to this interpretation, the construction of a water intake structure would qualify as a mandatory activity.

#### 4.4.2.2.2 Water Discharge

The discharge of used water could be a mandatory activity and thus trigger an EA process under the EPEA. The used water discharge could qualify as a water diversion structure if it meets the criteria set out in Schedule 1(d) of the *Mandatory Activities Regulation*. On the other hand, Schedule 2(iii) of the *Mandatory Activities Regulation* exempts wastewater systems. If the water discharge is an exempted activity then an EA process will depend on the discretion of the director. If it is a mandatory activity then an EA will be carried out. Schedule 1(d) applies to water as opposed to Schedule 2(iii) which deals with wastewater. Consequently, the classification of the used water as water or as wastewater will influence whether the discharge is considered to be a mandatory or exempted activity. The following analysis will start with the exempted activities under Schedule 2. Pursuant to Schedule 2(iii) of the *Mandatory Activities Regulation* a wastewater system that is subject to the *Wastewater and Storm Drainage Regulation (Wastewater Regulation)*<sup>209</sup> is an exempted activity. The used water from the nuclear power plant could be part of a wastewater system subject to the *Wastewater Regulation*. According to section 2 of the *Wastewater Regulation*, the regulation only applies to a wastewater system or storm drainage system as designated in (a) Schedule 1, Division 2, Part 7, or (b) Schedule 2, Division 2 of the ADR.<sup>210</sup> This Part of the ADR provides under “(g) the construction, operation or reclamation of a wastewater system that uses a wastewater treatment plant other than a wastewater lagoon, and ... (ii) that serves an industrial development or privately owned development and (A) discharges treated wastewater off the site of the development, or (B) is designed to treat more than twenty five cubic metres of wastewater per day; ....” According to section 1(2) of the ADR, terms which are defined in the EPEA have the same meaning in the Regulation unless the Regulation gives the term a different meaning. The ADR sets out specific definitions for Schedule 1, Division 2, such as wastewater lagoon in section 2(2)(ttt) and wastewater treatment plant in section 2(2)(uuu). However, wastewater, pursuant to section 2(2)(rrr) is defined as domestic wastewater and may include industrial wastewater. Industrial wastewater is defined under section 2(2)(aa) of the ADR as the

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<sup>208</sup> Alberta Research Council, *ibid* at 73. In that scenario the water consumption would be at 10,000,000 m<sup>3</sup> per year.

<sup>209</sup> Alta Reg 119/93 [*Wastewater Regulation*].

<sup>210</sup> ADR, *supra* note 195.

composite of liquid wastes and water-carried wastes, any portion of which results directly from an industrial process carried on at a plant. Still it is not clear, what waste is. However, section 1(II) of the *Waste Control Regulation*<sup>211</sup> defines “waste” as any solid or liquid material or product or combination of them that is intended to be treated or disposed of or that is intended to be stored and then treated or disposed of, but does not include recyclables. During normal operation of a nuclear power plant, water will be taken from a water body and before it is used in the cooling loop it will be treated with chemicals in order to avoid corrosion of the technical equipment.<sup>212</sup> Consequently, the water from the cooling loop will at least contain “chlorine and other chemicals used to control corrosion and the accumulation of microbes and minerals.”<sup>213</sup> In a CANDU reactor the once-through water cycle is used which means that the used water from the cooling loop will then be discharged to a water body. However, during normal operation of a nuclear power plant routine release of radionuclides, in particular tritium oxide and carbon-14, to the surface water will occur.<sup>214</sup> According to the definition of waste the liquid material has to be treated. Here it is presumed that the used water containing chlorine and other corrosion preventing chemicals are treated in a treatment facility before it is discharged. Therefore, the discharged water from the cooling system is liquid waste. Schedule 2(a)(iii) of the *Mandatory Activities Regulation* applies. The water discharge is an exempted activity. Therefore, no mandatory EA has to be carried out.

#### 4.4.2.3 Exclusive Federal Power over Nuclear Energy

The preliminary outcome of the above analyses is that a mandatory EA at the provincial level in Alberta appears to be triggered under two aspects: first based on the fact that a nuclear power plant appears to be a thermal electrical power generating plant and second because of the water intake.

What are the implications of this outcome? If this is the final result then nuclear power plants in general are also subject to the provincial EA process. As discussed before, the CNSC is the federal regulator for the licensing process of nuclear power plants and this includes the authority to carry out EAs. The second aspect, water intake structures, is also subject to the federal licensing process of nuclear power plants under the NSCA, the CEEA (2012) and the *Fisheries Act*.<sup>215</sup>

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<sup>211</sup> Alta Reg 192/1996.

<sup>212</sup> Nuclear Power Expert Panel, *supra* note 50 at 28. Regarding corrosion in nuclear power plants and in particular CANDU reactors see: D Barber & DH Lister, “Chemistry of the Water Circuits of CANDU Reactors” in *Water Chemistry and Corrosion Problems in Nuclear Power Plants* (Vienna: IAEA, 1983) 149-161.

<sup>213</sup> Nuclear Power Expert Panel, *ibid* at 4.4.2.

<sup>214</sup> Winfield et al, *supra* note 50 at 70; IAEA, *Effects of Ionizing Radiation on Aquatic Organisms and Ecosystems*, Technical Reports Series No 172 (Vienna: IAEA, 1976) at 9. It has to be noted that cooling water is not contact with the nuclear fuel and thus cannot release radioactivity into the environment. However there are other routine discharges besides the discharge of the cooling water, during normal operation.

<sup>215</sup> *Fisheries Act*, *supra* note 139, s 30. For legal aspects of cooling water intake structures in nuclear

This conclusion derived from the grammatical analysis has to be coherent with the contextual interpretation i.e. statutes have to be interpreted in their entire context, and in coherence with any higher enactments (contextual method).<sup>216</sup> The federal government has the exclusive jurisdiction over nuclear power. The following part of this paper will expand on what the term “exclusive power” means and where its limits are. To determine the scope of the power over nuclear energy is crucial because in the *Oldman River* decision<sup>217</sup> environmental assessments are described as being auxiliary to the primary area of jurisdiction. The scope will be approached by the use of general doctrines regarding the interpretation of the Constitution and relevant case law.

#### 4.4.2.3.1 General Constitutional Doctrines and Case Law

Sections 91 and 92 of the *Constitution Act, 1982* are each exclusive. However, the power of the federal Parliament inevitably overlaps with the power of the provinces which then raises the question about how each of these powers can be exclusive.<sup>218</sup>

There are a couple of principles to resolve jurisdictional issues between federal and provincial laws. Federalism is a fundamental guiding principle of the Canadian Constitution.<sup>219</sup> A major component of federalism is the division of powers: “[e]ach head of power was assigned to the level of government best placed to exercise the power.”<sup>220</sup> “The interpretation of these powers and of how they interrelate must evolve and must be tailored to the changing political and cultural realities of Canadian society.”<sup>221</sup> The constitutional doctrines, such as pith and substance, double aspect, paramountcy *etc.*, were developed by Canadian courts to interpret the division of powers.

The constitutional doctrines permit an appropriate balance to be struck in the recognition and management of the inevitable overlaps in rules made at the two levels of legislative power, while recognizing the need to preserve sufficient predictability in the operation of the division of powers. ... constitutional doctrine must facilitate, not undermine what this Court has called ‘co-operative federalism’.<sup>222</sup>

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power plants in Canada see Ahab Abdel-Aziz & Matthew Benson, “Regulation of Cooling Water Intake Structures: A Case for Consultative Policy Making” in Stanley Berger & Dianne Saxe, eds, *Key Developments in Environmental Law* (Aurora: Cartwright Group, 2009) 41 at 45-51.

<sup>216</sup> See e.g. *United Taxi Drivers’ Fellowship of Southern Alberta v Calgary (City)*, 2004 SCC 19 at para 8; *Bell ExpressVu Ltd Partnership v Rex*, [2002] SCC 42 at para 26; Maureen F Fitzgerald, *Legal Problem Solving: Reasoning, Research and Writing*, 4<sup>th</sup> ed (Markham: LexisNexis, 2007) at 245-247; Elmer A Driedger, *The Construction of Statutes*, 2d ed (Toronto: Butterworths, 1983) at 87.

<sup>217</sup> *Oldman River*, *supra* note 148.

<sup>218</sup> Patrick Monahan & Byron Shaw, *Constitutional Law*, 4<sup>th</sup> ed (Toronto: Irwin Law, 2013) at 114.

<sup>219</sup> *Reference re Secession of Quebec*, [1998] 2 SCR 217 at para 55.

<sup>220</sup> *Canadian Western Bank v Alberta*, [2007] 2 SCR 3 at para 22 [*Canadian Western Bank*].

<sup>221</sup> *Canadian Western Bank*, *ibid* at para 23; *Edwards v Canada (Attorney General)*, [1930] AC 124 (Canada PC) at para 136.

<sup>222</sup> *Canadian Western Bank*, *ibid* at para 24.

The constitutional assessment of statutes involves three aspects: validity, applicability and operability of the law. The validity of a law is challenged if “the matter of the law (or its pith and substance) comes within a class of subjects that is outside the jurisdiction of the enacting legislative body.”<sup>223</sup> A law is inapplicable if it is valid but has to “be interpreted so as not to apply to the matter that is outside the jurisdiction of the enacting body.”<sup>224</sup> The law is then inapplicable to the extra-jurisdictional matter. This understanding is technically achieved by reading it down (reading down doctrine). Thirdly, the doctrine of paramountcy might lead to the result that a law is inoperative. Where a provincial law is inconsistent with a federal law the federal law will prevail and the provincial law is inoperative but only to the extent of the inconsistency.<sup>225</sup>

To determine the division of powers between the federal and provincial governments the “pith and substance” doctrine must be applied first. In order to determine the validity of legislation the first doctrine to apply is “Pith and Substance”.<sup>226</sup> This doctrine follows two main steps. The first step asks for the determination of the essential character or core of the law.<sup>227</sup> To determine the true meaning the court has to analyze the purpose and the legal effect of the impugned law.<sup>228</sup> “The purpose of the legislation may be revealed by reference to a purpose clause inserted in the statute itself, or through consideration of extrinsic material such as debates in Parliament or the relevant legislature ....”<sup>229</sup>

In the second step “the court matches the legislation as characterized through the first stage into the appropriate category of legislative power. If a statute is in relation to a head of power that is within the jurisdiction of the enacting legislature, the fact that it may have effects on another head of power outside of that jurisdiction is irrelevant for division of powers purposes.”<sup>230</sup> This doctrine is understood as recognizing that in practice the jurisdiction over a matter will also affect matters within the power of the other level of government.<sup>231</sup>

Also, some matters are by their very nature impossible to categorize under a single head of power: they may have both provincial and federal aspects. Thus the fact that a matter may for one purpose and in one aspect fall within federal jurisdiction does not mean that it cannot, for another purpose and in another aspect, fall within provincial competence: *Hodge v. R.* (1883), (1883-84) L.R. 9 App. Cas. 117 (Ontario P.C.), at p. 130; *Québec (Commission de la santé & de la sécurité du travail) v. Bell Canada*, [1988] 1 S.C.R. 749 (S.C.C.) (“Bell Canada (1988)”), at p. 765. The double aspect doctrine, as it is known, which applies in the course of a pith and substance analysis, ensures that the policies of the elected legislators of both levels of government are respected.<sup>232</sup>

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<sup>223</sup> Hogg, *supra* note 117 at 15-28.

<sup>224</sup> Hogg, *ibid* at 15-28.

<sup>225</sup> Hogg, *ibid* at 15-28.

<sup>226</sup> *Reference re Securities Act*, 2011 ABCA 77, [2011] AWLD 1584 at 14.

<sup>227</sup> *Reference Re Firearms Act*, [2000] 1 SCR 783 at paras 15-16.

<sup>228</sup> *Canadian Western Bank*, *supra* note 220 at para 27.

<sup>229</sup> *Monahan & Shaw*, *supra* note 218 at 124.

<sup>230</sup> *Monahan & Shaw*, *ibid* at 125.

<sup>231</sup> *Canadian Western Bank*, *supra* note 220 at para 29.

<sup>232</sup> *Canadian Western Bank*, *ibid* at para 30.

After the matter or pith and substance of a law has been identified, it has to be determined to which classes of subjects (heads of legislative power) the matter belongs. As discussed earlier, sections 91 and 92 of the *Constitution Act, 1867* and section 92A of the *Constitution Act, 1982* list classes of subjects which are exclusive to the respective legislative body. The exclusiveness of the lists does not mean that identical laws may not be enacted by the federal government and a provincial government.

The Court in *Reference re Securities Act* pointed out that “[t]he division of powers in the Constitution Act does envision that some legislative provisions will overlap. The ‘double aspect doctrine’ recognizes that similar provincial and federal legislation may all be constitutional, because they fall within both a provincial and a federal head of power.”<sup>233</sup> The double aspect doctrine requires that both the provincial and federal legislation in question are valid. In *Reference re Securities Act*, J.A. Slatter pointed out that the double aspect doctrine was only applied when both statutes overlapped at the periphery but never where both acts would be wholesale duplications of each other: “[t]he doctrine is usually applied where the federal and provincial legislation is ‘enacted for different purposes and in different legislative contexts which give them distinct constitutional characterizations’.”<sup>234</sup> Although the double aspect doctrine is a recognized doctrine it is not a “desirable situation to have both levels of government regulating in a particular area.”<sup>235</sup> According to the double aspect doctrine,<sup>236</sup> it is possible that both levels of government may enact laws relating to the same matter.<sup>237</sup> However:

provincial laws may validly extend to federal subjects unless the law “bear upon those subjects in what makes them specifically of federal jurisdiction”. The rule that emerged from this formulation was this: if the provincial law would affect the ‘basic, minimum and unassailable’ core of the federal subject, then the interjurisdictional immunity doctrine stipulated that the provincial law must be restricted in its application (read down) to exclude the federal subject. If, on the other hand, the provincial law did not affect the core of the federal subject, then the pith and substance doctrine stipulated that the provincial law validly applied to the federal subject.<sup>238</sup>

The doctrine of interjurisdictional immunity provides that “certain persons or undertakings that are specifically assigned to federal jurisdiction are immune from the application of provincial laws that affect an ‘essential or vital part’ of their management and operations.”<sup>239</sup> Provincial law may not be applied to a federal undertaking if such an

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<sup>233</sup> *Reference re Securities Act*, *supra* note 226 at 43.

<sup>234</sup> *Reference re Securities Act*, *ibid* at 45.

<sup>235</sup> *Reference re Securities Act*, *ibid* at 46.

<sup>236</sup> The “double aspect” doctrine has its roots in the Privy Council decision in *Hodge v R* (1883), 9 App Cas 117, 130: “subjects which in one aspect and for one purpose fall within s 92, may in another aspect and for another aspect purpose fall within s. 91”. In other words, some laws can have both a federal and a provincial matter and thus assign jurisdiction to both the federal and the provincial government.

<sup>237</sup> Monahan & Shaw, *supra* note 218 at 127, 128; Hogg, *supra* note 117 at 15-38.3, 38.4.

<sup>238</sup> Hogg, *ibid* at 15-38.3.

<sup>239</sup> See also regarding interjurisdictional immunity and nuclear facilities Ian Richler, “The Continuing Uncertainty over the Applicability of Provincial Environmental Law to Nuclear Facilities” in Stanley Berger, ed, *Key Developments in Environmental Law* (Aurora: Thomson Reuters, 2010) 73-87.

application would ‘bear upon the undertaking in what makes it specifically of federal jurisdiction’.”<sup>240</sup>

However, not in all situations are federal undertakings exempt from all provincial laws. Monahan points out that “[f]ederal undertakings are still subject to provincial statutes of general application as long as the application of these provincial laws ‘does not bear upon those subjects in what makes them specifically of federal jurisdiction’.”<sup>241</sup> Whether provincial laws can be applied to federal undertakings depends on whether they affect a vital aspect of the federal undertaking or not. In particular, in the environmental area the question is to what extent can provincial environmental laws validly apply to federal undertakings? In *R. v. Canadian Pacific Ltd.* the SCC decided that Canadian Pacific had to comply with provisions of the Ontario *Environmental Protection Act*.<sup>242</sup>

#### 4.4.2.3.2 Thermal Electrical Power Generating Plants

EPEA prompts consideration of different constitutional issues. The purpose of section 2 of the EPEA sets out that the objective of the Act is to support and promote the protection, enhancement and wise use of the environment. As illustrated above, the environment is not a specific matter which belongs to one head of power only. Generally, the provinces may enact environmental legislation which is related to processes in nuclear power plants. But, EPEA in conjunction with the *Mandatory Activities Regulation* prescribes an EA process for an Alberta nuclear power plant in its entirety. The environmental assessment of nuclear power plants belongs to the core of the federal power over nuclear energy. Consequently, EPEA and the *Mandatory Activities Regulation* affect the core of the federal power. The act and its *Mandatory Activities Regulation* should be read down. Section 44 of EPEA in conjunction with Schedule 1(k) of the *Mandatory Activities Regulation* apply to thermal electrical power generating plants but exclude nuclear power plants. EPEA and its *Mandatory Activities Regulation* are valid but inapplicable to nuclear power plants. No mandatory provincial EA is triggered by Schedule 1(k) of the *Mandatory Activities Regulation*.

#### 4.4.2.3.3 Water Diversion Structure

Do water diversion structures fall under exclusive federal jurisdiction according to section 92(10)(c) of the *Constitution Act, 1867* in conjunction with section 18 of the NEA,<sup>243</sup> or are they activities that can be separated from a federally regulated undertaking and thus be a project under provincial jurisdiction? The general constitutional principles will be addressed after analyzing the relevant case law.

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<sup>240</sup> Monahan & Shaw, *supra* note 218 at 132.

<sup>241</sup> Monahan & Shaw, *ibid* at 132.

<sup>242</sup> *R v Canadian Pacific Ltd.*, [1995] 2 SCR 1028. Canadian Pacific offence under the Ontario *Environmental Protection Act* was to discharge contaminants into the natural environment which likely had environmental impacts.

<sup>243</sup> NEA, *supra* note 116.

In order to define the scope of the exclusive federal power over nuclear energy, the landmark decision of the SCC in *Society of Ontario Hydro Professional & Administrative Employees v. Ontario Hydro*<sup>244</sup> provides important guidance. The Court had to decide whether labour relations in a nuclear power plant fell under federal or provincial jurisdiction. In a split decision (4/3) the Court found that labour relations in a nuclear power plant could fall under exclusive federal jurisdiction. Following the preamble of the former AECA<sup>245</sup> and the NSCA,<sup>246</sup> the federal government, acting in the national interest, has to consistently apply national and international standards to the development, production and use of nuclear energy. The Court found that the control and supervision of the application and use of nuclear energy includes labour relations at nuclear facilities. Chief Justice Lamer noted that federal government jurisdiction over a declared work must be limited in order to maintain the constitutional division of powers; but the federal interests involved have to be appropriately recognized.<sup>247</sup> Under POGG the jurisdiction of the federal government is limited to the national concern aspects of atomic energy being nuclear production and the associated safety concerns.<sup>248</sup> An examination of the national and international regulatory frameworks applicable to the production of nuclear energy and the effects of section 92A(1)(c) of the *Constitution Act, 1867* led the majority in *Ontario Hydro* to the conclusion that the federal Parliament's declaratory power and POGG were triggered.<sup>249</sup>

[T]he federal Parliament's jurisdiction over a work subject to a declaration includes some level of control over the activities which occur on or in connection with it.<sup>250</sup> The effect of a declaration "must surely be to bring within federal authority not only the physical shell or facility but also the integrated activity carried on therein; in other words, the declaration operates on the work in its functional character."<sup>251</sup>

The jurisdiction to "regulate a work and its related integrated activity, here the production of nuclear energy, *prima facie* includes jurisdiction to make laws respecting its labour relations."<sup>252</sup> The Court, *inter alia*, referred to the *Northern Telecom Canada Ltd. v. Communication Workers of Canada*<sup>253</sup> decision where the activity at issue was assessed by the "normal or habitual activities" test as "a going concern".<sup>254</sup>

Applying the same test to employees involved in the production of nuclear energy at Ontario Hydro's nuclear facilities, I think it is clear that their "normal or habitual activities" are intimately related to the federal interests in nuclear energy, since the extent of the federal government's interest

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<sup>244</sup> *Ontario Hydro*, *supra* note 112.

<sup>245</sup> AECA, *supra* note 115.

<sup>246</sup> NSCA, *supra* note 29.

<sup>247</sup> *Ontario Hydro*, *supra* note 112 at para 2.

<sup>248</sup> *Ontario Hydro*, *ibid* at para 2.

<sup>249</sup> *Ontario Hydro*, *ibid* at para 3.

<sup>250</sup> *Ontario Hydro*, *ibid* at para 28.

<sup>251</sup> Neil Finkelstein, *Laskin's Canadian Constitutional Law*, 5<sup>th</sup> ed (Toronto: Carswell, 1986) at 629.

<sup>252</sup> *Ontario Hydro*, *supra* note 112 at para 29.

<sup>253</sup> *Northern Telecom Canada Ltd v Communication Workers of Canada*, [1983] 1 SCR 733.

<sup>254</sup> *Ontario Hydro*, *supra* note 112 at para 30.

in nuclear power production is its interest in health, safety and security, matters completely within the daily control of those operating nuclear facilities. The IAEA materials make this clear.<sup>255</sup>

Therefore, I would conclude under both the declaratory jurisdiction and the p.o.g.g. jurisdiction, that the labour relations of Ontario Hydro's employees involved in the production of nuclear energy, related as it is to the federal interest in atomic energy, is an integral and essential part of Parliament's jurisdiction, as it was found to be in previous cases like the trilogy in connection with other integrated activities connected to federally declared works.<sup>256</sup>

The key comments in *Ontario Hydro* are:

... those employees actually employed on or in connection with facilities for the production of nuclear energy are federally regulated. ... The source of energy at nuclear facilities is a nuclear fission reaction, which generates heat energy, which is then used to turn water into steam. That steam drives the turbine, which spins the generator, which produces the electricity by means of an electromagnet and wire coils. The affidavit makes it clear that, once the steam is produced, there is no difference between thermal (i.e., fossil-fuel) and nuclear electrical generation. ... I am of the view that it is only those employees involved in the first of the three parts of the generation phase who would be federally regulated. That is, those employees engaged in using nuclear reactors to generate heat energy would be covered by the federal legislation, while those who are involved with using that heat energy to run the turbine, which in turn runs the generator, would be provincially regulated. The former employees are employed in the production of nuclear (heat) energy, and come under federal jurisdiction under both the declaratory and p.o.g.g. powers; the latter employees are employed in the production of electricity, and the management of their activities falls to the provinces under s. 92A(1)(c).<sup>257</sup>

The judgement separates a nuclear power plant into two plants: one plant for the production of nuclear (heat) energy and the other for the generation of electricity which uses the heat energy.<sup>258</sup> Accordingly, the moment when the heat energy is produced marks the important point where jurisdiction shifts from the federal to the provincial government.

Justices La Forest, L'Heureux-Dubé and Gonthier came to the same conclusion as C.J. Lamer but they adopted a slightly different reasoning. They started with the declaratory power. Pursuant to section 92(10)(c) of the *Constitution Act, 1867* Parliament may declare local works which are within the provincial power, as being for the general advantage of Canada. The effect of such a declaration is that those works fall by virtue of section 91(29) of the *Constitution Act, 1867* within the jurisdiction of the federal Parliament. Provincial jurisdiction over the work is then ousted.<sup>259</sup> *Ontario Hydro* concluded that a declaration incorporated a work as a functioning unit.<sup>260</sup> The declaration is expressed in section 18 of the NEA and comprises works and undertakings for the production, use and application of nuclear energy. However, La Forest and colleagues found that the declaration did not cover

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<sup>255</sup> *Ontario Hydro*, *ibid* at para 31.

<sup>256</sup> *Ontario Hydro*, *ibid* at para 32.

<sup>257</sup> *Ontario Hydro*, *ibid* at para 42.

<sup>258</sup> *Ontario Hydro*, *ibid* at para 43.

<sup>259</sup> *Ontario Hydro*, *ibid* at para 57.

<sup>260</sup> *Ontario Hydro*, *ibid* at para 58.

the whole undertaking of Ontario Hydro and thus “is confined to facilities *constructed for the production, use and application of atomic energy*, not to those constructed for the production of electrical energy by other means.”<sup>261</sup> The Court noted that is no reason to interpret the declaratory power narrowly.

Quite the contrary. It might, I suppose, have been possible to interpret s. 92(10)(c) so as to confine it to works related to communications and transportation such as those specifically listed in s.92(10)(a) and (b) but the courts, including this Court, have never shown any disposition to so limit its operation, and a wide variety of works, railways, bridges, telephone facilities, grain elevators, feed mills, atomic energy and munition factories — have been held to have been validly declared to be for the general advantage of Canada.<sup>262</sup>

In *Mudjatik Thyssen Mining Joint Venture*<sup>263</sup> the Saskatchewan Labour Relations Board had to decide similar issues of whether employee relations in a uranium mine were governed by federal or provincial jurisdiction. The Board considered *Ontario Hydro* and noted: “[h]owever, those employees involved in using the heat energy produced by the reactors to produce steam to run the turbines, which in turn run the generator, are provincially regulated since they are engaged in the production of electricity no differently than persons engaged in producing electricity by use of non-nuclear means to power turbines or generators.”<sup>264</sup> Furthermore, the Board referred to the Supreme Court of Canada decision in *Construction Montcalm Inc. v. Quebec (Minimum Wage Commission)*<sup>265</sup> in which the Court compared nuclear energy and aeronautics as being both subject to exclusive federal jurisdiction. “The majority of the Supreme Court of Canada held that the labour relations of the persons involved in the construction of the airport were not an integral part of federal competence over aeronautics, which included such core activities as aerial navigation and airport operation, but not construction before such core activities commenced.”<sup>266</sup> The Court in *Montcalm* also assumed that labour relations must be an integral element of federal competence.<sup>267</sup> However, the Board in *Mudjatik Thyssen Mining* generally confirmed the criteria developed in *Ontario Hydro* but found that these criteria articulated by the Supreme Court of Canada cannot be applied in a rigid manner, “but must be flexible and sensitive to the particular facts of the case — uranium mining is very different from telecommunications, aeronautics, trucking, railroading and shipping, and even nuclear power generation.”<sup>268</sup>

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<sup>261</sup> *Ontario Hydro*, *ibid* at para 66.

<sup>262</sup> *Ontario Hydro*, *ibid* at para 69.

<sup>263</sup> *International Brotherhood of Electrical Workers, Local 529 v Mudjatik Thyssen Mining Joint Venture*, [2003] Sask LRBR 242 [*Mudjatik Thyssen Mining*].

<sup>264</sup> *Mudjatik Thyssen Mining*, *ibid* at para 68.

<sup>265</sup> *Construction Montcalm Inc v Quebec (Minimum Wage Commission)* (1978), [1979] 1 SCR 754 (SCC) [*Montcalm*].

<sup>266</sup> *Montcalm*, *ibid* at 132.

<sup>267</sup> *Montcalm*, *ibid* at 132.

<sup>268</sup> *Mudjatik Thyssen Mining*, *supra* note 263 at para 73.

The criteria of the test set out in *Ontario Hydro*, can be summarized as follows: the activity has to be a normal or habitual activity and be an integral part of a functioning unit in order to fall under the federal power.

The test applied in *Ontario Hydro* is relevant to the analysis of the jurisdictional reach of provincial EAs of a proposed nuclear power plant in Alberta. Water use in a nuclear power plant is an essential process within the heat and steam production stage. The intake of water from a water body, use for the cooling system and the final discharge of used water into a water body can be characterized as a normal and habitual activity in a (nuclear) power plant. These activities are integral to the nuclear energy production process. However, in *Ontario Hydro* the Court found that once the steam is produced, there is no difference between thermal (i.e., fossil-fuel) and nuclear electrical generation. The Court shifted jurisdiction over labour relations from the federal government towards the provinces at the moment the steam was produced. If this test is strictly applied in the case of a nuclear power plant, then jurisdiction related to water use will be assessed as follows. Water use is part of the production of nuclear energy which can be described as being a normal or habitual process within a thermal electrical power plant. Water intake and use in the nuclear power plant would fall within exclusive federal jurisdiction until the steam is produced. The discharge of the used water would then be governed by the province of Alberta. But the federal government also has jurisdiction over the water discharge if the water is frequented by fish as defined in the *Fisheries Act*.<sup>269</sup>

The question is whether this rule or distinction can and should be applied in such a rigid manner. The concern is that strictly applying the test would artificially dismember a functionally linked unit — water use. The interpretation must not lead to the result that the federal power extends only to a physical shell. Another concern is that the purpose of an environmental assessment as an information gathering and planning process, that should ideally consider all aspects related to the specific activity, will be compromised.

Regarding the first concern it can be argued that the Court in *Ontario Hydro* split up labour relations of one power plant without dismembering a unit. From a theoretical perspective, the water use can also be separated into two main activities: the water intake and the water discharge. But the purpose of determining who has the jurisdiction to carry out an EA over water use for generating nuclear power may require a different result which does not just schematically chop one whole into several possibly contrivable pieces. The assigned purpose and envisaged function of an environmental assessment process has to be preserved.

The rule was set up to clarify the division of power regarding labour relations in a nuclear power plant. Labour relations is a completely different process than water use. Water use is a process which is similar at each power plant, independent of which fuel is burned. However, there are minor differences between nuclear and other thermal power plants with respect to water use. The fact that water use is similar at any power plant could lead to the conclusion that this whole process of water use is not a specific feature of nuclear power plants. Only those specific activities which are related to the production of

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<sup>269</sup> *Fisheries Act*, *supra* note 139 at ss 30 & 35.

nuclear energy are covered by the exclusive federal power in order to preserve provincial jurisdiction over local works and undertakings and the development and management of facilities for the generation and production of electrical energy. On the other hand, the test in *Ontario Hydro* does not require that the activity at issue be very different and special compared with other activities taking place at a power plant. Recalling the criteria of the test, the activity has to be a normal or habitual activity and an integral part of a functioning unit. Water use is a normal activity and an important part of the whole process of generating electricity at a nuclear power plant. This interpretation suggests that water use and thus the water supply facilities are subject to the federal exclusive power. Consequently, the federal government also has the power to carry out an EA regarding water use. This interpretation conflicts partly with the wording of EPEA and the *Mandatory Activities Regulation*. Thus, the next discussion will assess the validity of both acts by applying the general constitutional doctrines. With these doctrines we can consider whether the water intake and discharge can validly be covered by EPEA and its *Mandatory Activities Regulation*.

In order to determine the validity of provincial laws potentially applicable to nuclear power generation, the Pith and Substance and the Double Aspect doctrine will be considered. The current federal EA trigger is based on the federal power over nuclear energy which includes water use. The provincial EA trigger is based on Alberta's jurisdiction over property and civil rights and matters of a merely local or private nature in the province (ss. 92(13) & (16) of the *Constitution Act, 1867*). The Government of Alberta is entitled to enact legislation concerning environmental protection of water, water intake, discharge and activities that are subject to an EA process. Such a trigger was identified in EPEA and the *Water Act*. In other words, the federal and provincial EA triggers derive from two different subject matters. In *Bell Canada* Justice Beetz set out that:

[w]orks, such as federal railways, things, such as land reserved for Indians, and persons, such as Indians, who are within the special and exclusive jurisdiction of Parliament, are still subject to provincial statutes that are general in their application, ... provided however that the application of these provincial laws does not bear upon those subjects in what makes them specifically or federal jurisdiction.<sup>270</sup>

Based on the double aspect doctrine the federal and provincial EA processes are triggered under different heads of power and thus there is no duplication, no overlap and generally speaking no infringement of the constitutional division of powers. The provincial laws also do not affect the core of the federal power over nuclear energy. The provisions in EPEA, the *Mandatory Activities Regulation* and the *Water Act* which require an EA process are valid provisions. However it has to be stressed that the Alberta EA process is limited to water intake and discharge activities and may not apply to activities for the construction and operation of the nuclear power plant.<sup>271</sup>

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<sup>270</sup> *Bell Canada v Quebec*, [1988] 1 SCR 749 at 29.

<sup>271</sup> The previous analysis might seem to be overly deep. However, in light of common statements made in the literature which oversimplify and thus could be considered incorrect it appeared to be necessary to

## 4.5 Summary

Consequently, the *Mandatory Activities Regulation* is valid, applicable and operative. EPEA's provisions for EA regarding water use in a nuclear power plant do not infringe the exclusive federal power over nuclear energy. The federal and provincial EA provisions regarding water may coexist. Water use and in particular water discharge is an important process in a nuclear power plant that has to be regulated by the federal government. The rigid interpretation of Ontario Hydro would dismember a functionally linked unit and prevent the federal government from satisfying international standards.

## 4.6 Consequences

The assessment of the environmental effects of a project, such as the construction and operation of a nuclear power plant in Alberta will trigger the federal EA process under CEAA (2012) and the Alberta EA process under EPEA. Consequently, the Alberta and federal governments need to arrange a joint environmental assessment. Environmental assessment harmonization<sup>272</sup> and cooperation<sup>273</sup> agreements are tools that are available if both, federal and provincial processes are triggered.<sup>274</sup> The objective of these agreements is to provide the federal and provincial governments with the flexibility to satisfy the legal requirements with a joint assessment process and then the project proponent is required to prepare only one EA report.<sup>275</sup> Cooperation agreements require the federal and the provincial governments to use the results of the joint assessment to reach a final decision, but either party is entitled to make its own decision independently from the other

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undertake a comprehensive interpretation. See e.g. Bowman: "The construction, operation or modification of a thermal electrical power generating plant that uses non-gaseous fuel and has a capacity of 100 megawatts (MW) or greater is designated as a mandatory activity. This description should apply to nuclear power reactors so long as they meet the 100 MW threshold." Laura Bowman, *Nuclear Power in the Prairies* (Edmonton: Environmental Law Centre, 2011) at 30.

<sup>272</sup> See e.g. the *Canada-Wide Accord on Environmental Harmonization* (29 January 1998), online: CCME <[http://www.ccme.ca/assets/pdf/accord\\_harmonization\\_e.pdf](http://www.ccme.ca/assets/pdf/accord_harmonization_e.pdf)>; *Sub-Agreement on Environmental Assessment*, online: CCME <[http://www.ccme.ca/assets/pdf/envtlassesssubagr\\_e.pdf](http://www.ccme.ca/assets/pdf/envtlassesssubagr_e.pdf)>; *Canada-Alberta Agreement on Environmental Assessment Cooperation [Cooperation Agreement]*, online: CEAA <<http://www.ceaa-acee.gc.ca/default.asp?lang=En&n=F93B8BF6-1>>.

<sup>273</sup> The history and development of federal-provincial cooperation is discussed in more detail in e.g. Kathryn Harrison, "Federal-Provincial Relations and the Environment: Unilateralism, Collaboration, and Rationalization" in Debora L VanNijnatten & Robert Boardman, eds, *Canadian Environmental Policy: Context and Cases*, 2d ed (Don Mills: Oxford University Press, 2002) 123 at 127-139; Blackman et al, *supra* note 111 at 526-532; Grace Skogstad & Paul Kopas, "Environmental Policy in a Federal System: Ottawa and the Provinces" in Robert Boardman, ed, *Canadian Environmental Policy: Ecosystems, Politics, and Process* (Don Mills: Oxford University Press, 1992) 43 at 51-58; Marshall Ogan, "An Evaluation of the Environmental Harmonization Initiative of the Canadian Council of Ministers of the Environment" (2000) 10 J Envtl L & Prac 15-37; Benidickson, *supra* note 148 at 44-51.

<sup>274</sup> Arlene Kwasniak, "Environmental Assessment, Overlap, Duplication, Harmonization, Equivalency, and Substitution: Interpretation, Misinterpretation, and a Path Forward" (2009) 20 J Envtl L & Prac 1 at 10.

<sup>275</sup> Kwasniak, *ibid* at 10.

government.<sup>276</sup> Generally, the question is whether the shared responsibility and a joint EA is the best solution in order to promote the previously described objectives of EAs and the objectives listed in the preambles of CEAA (2012) and EPEA. There is no real evidence about whether a joint federal-provincial EA process is effective in terms of achieving the highest environmental impact mitigation standards available from the two EA processes. Opinions about this issue diverge. Greenpeace, for example, has criticised the Ontario government's decision to not actively participate in the EA process regarding the proposed new nuclear power plant in Kincardine, Ontario thereby avoiding a joint EA. Greenpeace argues that the Ontario Government erroneously concluded that it is not legally obliged to carry out a provincial EA.<sup>277</sup> The environmental non-government organization argues that the Ontario government should have participated in the EA process. The environmental group has noted that the proposed nuclear power plant will be the first to be built in Canada in the last twenty five years; that the project has the potential to cause serious adverse environmental effects; and that the people of Ontario could be burdened with potential environmental and health effects for centuries.<sup>278</sup> On the other hand, in the case of future nuclear projects in Alberta, the provincial and federal governments will have to agree on a common standard applicable to the EA.

## Part 5 Conclusion

In the future Alberta may be faced with another application for the construction of a commercial nuclear power plant to generate more electricity to facilitate increased oil sands production. The provincial government's interest in promoting the commercial development of oil sands resources occurs at a time of increasing awareness of climate change. The provincial government may therefore decide that nuclear power plants represent a more attractive lower carbon intensive technology than natural gas or coal for electricity generation that could assist the province in meeting its CO<sub>2</sub> emission targets.

This analysis indicates the exclusive federal power over nuclear energy is not an all-encompassing power and the constitutional division of powers has to be discerned at the limit of the federal power, as was discussed in the context of the environmental assessment of the proposed nuclear power plant in Alberta.

In addition to the need for more clarity with respect to the division of powers, other aspects, such as the effectiveness of cooperative EA processes prompts further research. Further research on the effectiveness of the EA process should focus on the ability of federal and provincial processes to achieve the highest potential for mitigation of

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<sup>276</sup> Kwasniak, *ibid* at 10.

<sup>277</sup> Greenpeace, *Politics over Precaution: Canada's Approach to New Nuclear Stations Comments on the Draft Environmental Assessment Guidelines for New Nuclear Power Plants at the Bruce Site in Ontario* (Toronto: Greenpeace Canada, June 2008) at 17, online: CEAA <<http://www.ceaa.gc.ca/050/documents/27768/27768E.pdf>>.

<sup>278</sup> Greenpeace, *ibid* at 17.

environmental, social and cultural impacts and the standard to be achieved from the combined EA processes in order to accomplish the objectives of a sound EA system.

Another issue in connection with the environmental assessment of nuclear power plants in Alberta is whether the introduction of a new type of energy generating technology for electricity production can be best addressed by carrying out only a project-based assessment or whether a strategic environmental assessment should be used. Thus far a strategic environmental assessment is employed on a limited basis. The single project-centred approach does not consider the interrelationship between nuclear energy and the oil sands industry. The definition of a project or proposed activity in CEAA (2012) and EPEA, at present, do not consider the association between nuclear energy and oil sands extraction which should be assessed together, with a focus on cumulative effects, in particular from a long-term perspective. Consistent with the sustainable development policy of the Alberta Government the issues arising solely from the oil sands, such as water use, tailings management and greenhouse gases are a challenge in themselves. As Kennett notes in the context of rapid oil sands developments in Alberta: “[t]he potential environmental implications of this massive increase in production over a relatively short time period are, to say the least, significant.”<sup>279</sup> A report<sup>280</sup> written by Golder Associates for Bruce Power emphasises the advantages of nuclear power during the construction and operation period, which are estimated to last 60 years. But the assessment ends then — only after 60 years. No comments are made about how the remote and relatively undeveloped area near Peace River will be affected after a nuclear power plant is decommissioned. Issues, such as, future unemployment or reduction in oil sands production have not been explored. A broad assessment of fundamental decisions, such as whether the introduction of nuclear power plants in the province of Alberta is feasible and advisable needs to be completed. Large-scale commercial introduction of nuclear energy in Alberta should prompt rethinking the established process for environmental assessments. The frequently cited *Brundtland Report* on sustainable development concludes that “[t]he generation of nuclear power is only justifiable if there are solid solutions to the presently unsolved problems to which it gives rise.”<sup>281</sup> Nuclear power plants in Alberta and elsewhere demand the consideration of many important issues, including long-term waste disposal, security and area development which cannot be handled properly by a single project-centred assessment. A strategic environmental assessment of nuclear power plants in Alberta with a broad focus on cumulative effects and sustainability promises to be a better starting point. However, in addition to such a broad assessment, the project based assessment of each proposed nuclear facility and related activity are of crucial importance.

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<sup>279</sup> Steven A Kennett, *Closing the Performance Gap: The Challenge for Cumulative Effects Management in Alberta's Athabasca Oil Sands Region*, Occasional Paper #18 (Calgary: Canadian Institute of Resources Law, 2007) at 1.

<sup>280</sup> Golder Associates, *supra* note 28 at ii.

<sup>281</sup> World Commission on Environment and Development, *Our Common Future* (Oxford: Oxford University Press, 1987) at ch III, para 63 [*Brundtland Report*].



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<b>Add GST/HST for orders placed in Canada</b> (CIRL GST No. 11883 3508 RT )			
<b>Total</b> (All prices subject to change without notice)			

**\*Add Shipping and Handling**

Within Canada: first book \$5.00; each additional book \$2.00

Outside Canada: first book \$10.00; each additional book \$4.00

December 2013