

**Water Body
Site Investigation Report**

**Napanee TS Taylor Kidd
Solar Energy Project**

prepared for
Axio Power Canada Inc./SunEdison Canada

DRAFT



ECOLOGICAL SERVICES

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Date

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1. Introduction

1.1. Project Description

Axio Power Canada Inc. (Axio Power) is proposing to develop a 10 megawatt (MW) solar photovoltaic project titled Napanee TS Taylor-Kidd Solar Energy Project. The Project Location¹ is a 36 hectare parcel situated on Part of Lots 27 and 28, Concession 1, Township of Loyalist (lower tier municipality) within the County of Lennox and Addington (upper tier municipality and within Picton Site Region 6E-15 (Figure 1.1). The property in which the Project Location is situated has been zoned Industrial by Loyalist Township.

1.2. Renewable Energy Approval Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, (herein referred to as the REA Regulation), came into force on September 24, 2009 and identifies the Renewable Energy Approval (REA) requirements for renewable energy generation facilities in Ontario. The REA Regulation has since been amended by O. Reg. 521/10, which came in effect as of January 1, 2011.

As per the REA Regulation (Part II, Section 4), ground-mounted solar facilities with a nameplate capacity greater than (>) 12 kilowatts (kW) are classified as Class 3 solar facilities and require an REA. Part IV, subsection 29 (1) of the REA Regulation requires proponents of Class 3 solar projects to conduct a water assessment consisting of a *Water Body Records Review* (Hatch Ltd., 2011) and a *Water Body Site Investigation*.

Subsection 1 (1) of the REA Regulation defines a “water body” as a lake, permanent stream, intermittent stream or seepage area, but does not include:

- a) grassed waterways
- b) temporary channels for surface drainage, such as furrows, or shallow channels that can be tilled or driven through
- c) rock chutes and spillways
- d) roadside ditches that do not contain a permanent or intermittent stream
- e) temporarily ponded areas that are normally farmed
- f) dugout ponds, or
- g) artificial bodies of water intended for the storage, treatment or recirculation of runoff from farm animal yards, manure storage facilities and sites and outdoor confinement areas.

Further, intermittent streams are defined as “a natural or artificial channel, other than a dam, that carries water intermittently and does not have established vegetation within the bed of the channel,

¹ “Project Location means, when used in relation to a renewable energy project, a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposed to engage in the project” (O. Reg. 359/09, s. 1 (1)).

except vegetation dominated by plant communities that require or prefer the continuous presence of water or continuously saturated soils for their survival” (O. Reg. 359/09).

Seepage areas are defined as “a site of emergence of groundwater where the water table is present at the ground surface, including a spring” (O. Reg. 359/09).

As amended by O. Reg. 521/10, subsection 31 (1) requires an investigation of the land and water within 120 metres of the Project Location, either by visiting the site or by alternative investigation of the site, in order to determine the following:

- a) whether the results of the analysis summarized in the Water Body Records Review Report (Hatch Ltd., 2011) prepared under subsection 30 (2) are correct or require correction, and identifying any required corrections;
- b) whether any additional water bodies exist, other than those that were identified in the Water Body Records Review Report (Hatch Ltd., 2011) prepared under subsection 30 (2);
- c) the boundaries, located within 120 m of the Project Location, of any water body that was identified in the Water Body Records Review Report (Hatch Ltd., 2011) or the site investigation; and
- d) the distance from the Project Location to the boundaries determined under clause (c).

Subsection 31 (2) of the REA Regulation has specific requirements if designated lake trout lakes are present within 300 m of the Project Location. These requirements were not deemed applicable to the Project as no such lakes were found in the Water Body Records Review Report (Hatch Ltd., 2011).

As amended by O. Reg. 521/10, subsection 31 (4) of the REA Regulation requires the proponent to prepare a report setting out the following:

1. A summary of any corrections to the Water Body Records Review Report (Hatch Ltd., 2011) and the determinations made as a result of conducting the site investigation.
2. Information relating to each water body identified in the Water Body Records Review Report (Hatch Ltd., 2011) and in the site investigation, including the type of water body, plant and animal composition and the ecosystem of the land and water investigated.
3. A map showing,
 - i. the boundaries mentioned in clause 31 (1) (c),
 - ii. the location and type of each water body identified in relation to the Project Location, and
 - iii. all distances mentioned in clause 31 (1) (d).
4. A summary of methods used to make observations for the purposes of the site investigation.
5. The name and qualifications of any person conducting the site investigation.
6. If an investigation was conducted by visiting the site:
 - i. the dates and times of the beginning and completion of the site investigation

- ii. the duration of the site investigation
 - iii. the weather conditions during the site investigation
 - iv. field notes kept by the person conducting the site investigation.
7. If an alternative investigation of the site was conducted:
- i. the dates of the generation of the data used in the site investigation
 - ii. an explanation of why the person who conducted the alternative investigation determined that it was not reasonable to conduct the site investigation by visiting the site.

This *Water Body Site Investigation Report* has been prepared to meet these requirements. A physical examination of the site was completed, and therefore, clause (3) (7) does not apply.

2. Summary of Records Review Results

The following table (Table 2.1) provides a summary of the determinations made in the *Water Body Records Review Report* (Hatch Ltd., 2011) with respect to water body features in and within a specified distance from the Project Location.

Table 2.1 Summary of Records Review Determinations

Determination to be Made	Yes/No	Description
Is the Project Location in a water body?	No	No water bodies were identified on or within 120 m of the Project Location.
Is the Project Location within 120 m of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity?	No	No lakes were identified on or within 120 m of the Project Location.
Is the Project Location within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity?	No	No lake trout lakes were identified in the vicinity of the Project Location.
Is the Project Location within 120 m of the average annual high water mark of a permanent or intermittent stream?	No	No permanent or intermittent streams were identified on or within 120 m of the Project Location. Cooke's Creek is the closest watercourse that was identified, and it is situated approximately 140 m north of the project location.
Is the Project Location within 120 m of a seepage area?	No	No seepage areas were identified on or within 120 m of the Project Location during the Records Review.

As outlined in Table 2.1, the *Water Body Records Review Report* (Hatch Ltd., 2011) did not identify any permanent and/or intermittent streams with the high water mark occurring within 120 m of the Project Location. The presence/absence of these and any additional water body features not identified in the *Water Body Records Review Report* (Hatch Ltd., 2011) is discussed in the following sections. Any corrections required to the *Water Body Records Review Report* (Hatch Ltd., 2011), particularly with respect to Table 2.1, is discussed in Section 5.

3. Site Investigation Details and Methodology

3.1. Site Investigation Details

Two separate site investigations were conducted on the Project Location and surrounding area, in accordance with subsection 31 (3), clauses (5) and (6) of the REA Regulation. These site investigations were undertaken to:

- verify information obtained in the *Water Body Records Review Report* (Hatch Ltd., 2011)
- document existing conditions, including the type of water body, plant and animal composition and the ecosystem of the land and water investigated
- identify any corrections required to the *Water Body Records Review Report* (Hatch Ltd., 2011) and determinations made as a result of conducting the site investigation.

3.1.1. Weather Conditions during the Site Investigations

- **Site Investigation 1** – The first site investigation was completed on June 17, 2010 from 1330 to 1630 hours for a total duration of 3 hours. The weather conditions during the site investigation were sunny and a temperature of approximately 26°C. Wind strength was estimated as light.
- **Site Investigation 2** – The second site investigation was completed on April 12, 2011 from 1145 to 1245 hours for a total duration of 1 hour. The weather conditions during the site investigation were partly cloudy with a temperature of approximately 12°C. There was no wind.

3.1.2. Qualifications of Investigator

The site investigations were completed by Dale Kristensen, MSc. a terrestrial ecologist for Ecological Services since 1988. Ecological Services specializes in the provision of services relating to ecological management and research and has been in operation in eastern Ontario since 1985. Their core personnel combine education and experience to give a strong focus on land use planning and management as they relate to natural resources. Dale's experience includes species recovery, environmental impact assessments, management plans, wetland evaluations, and municipal land use planning. He has research experience in forest fragmentation and avian ecology. Dale is a member of the COSEWIC Species Recovery Teams for Deerberry (*Vaccinium stamineum*) and Cerulean Warbler (*Dendroica caerulea*), and is a Certified Butternut Health Assessor for the Province of Ontario.

3.2. Site Investigation Methodology

Prior to conducting the site investigations, background information and available hydrological mapping was reviewed to determine water body features on and within 120 m of the Project Location. Satellite imagery produced by Google Earth Pro was also accessed to identify potential water body features not captured by the information sources reviewed in the *Water Body Records Review Report* (Hatch Ltd., 2011).

Following the desktop exercise, those features identified in the *Water Body Records Review Report* (Hatch Ltd., 2011) or through an interpretation of satellite imagery were ground-truthed during the site investigations. This involved walking the entire Project Location to document existing environmental conditions and to verify the presence of water body features on and within the 120 m setback. A field book was used to keep records of all observations made during the site investigations and photographs were taken to show the existing conditions on the Project Location. A copy of the field notes are provided in Appendix 1.

The location of each water body observed during the site investigations was recorded using a Garmin GPS-12 handheld Global Positioning System (GPS) device. Waypoint accuracy during the site investigation was ± 5 m. The handheld GPS device was also used to demarcate the annual high water mark for each water body. Biophysical characteristics of topography and vegetation communities were used as the primary indicators of annual flooding. The type of water body (i.e., lake, permanent or intermittent stream, seepage area), and the associated plant and animal communities were investigated and documented. This included information such as the rate of water flow, direction of flow, physical characteristics of the water, in-stream habitat types (e.g., channel morphology, substrate, water depth), riparian habitat conditions (e.g., bank height, bank vegetation and substrate, presence of overhanging vegetation or undercut banks) and evidence of wildlife use. Features such as temporarily ponded areas, channel-like features and dug-out ponds were also investigated to assess if they meet the definition of a water body according to subsection 1 (1) of the REA Regulation.

4. Results of the Site Investigation

This section documents the results of the site investigations and discusses specific water body features observed on and within 120 m of the Project Location. Water body features that meet the definition of a water body according to the REA Regulation are shown on Figure 4.1. Other water features that were identified during the site investigations but don't meet the definition of a water body are also shown on Figure 4.1. The boundaries and distances of each water body feature (this excludes water features that do not meet the definition of a water body) confirmed during the site investigations are shown on Figure 4.1, including a 120 m setback from the Project Location, as per the requirements of subsection 31 (3) of the REA Regulation.

4.1. Site Description

The Project is located within a small subwatershed associated with Cooke's Creek that covers approx. 25 km². The watershed region is flat and composed primarily of woodland and abandoned agricultural lands bordering a transportation artery for the City of Kingston (Taylor Kidd Blvd). Cooke's Creek flows approx. 6 km southeast from its headwaters to empty into Lake Ontario via Parrott's Bay.

The Project Location is situated north of Taylor Kidd Blvd in a rural area dominated by early-mid successional woodlands, conifer plantation and cultural thicket on abandoned agricultural lands (Figure 4.2). The City of Kingston is located approx. 15 km to the east.

Surface run-off from the Project Location is ultimately conveyed north to Cooke's Creek or south across Taylor Kidd Blvd and eventually to Lake Ontario. There are no watercourses or water bodies present on or within 120 m of the Project Location. Cooke's Creek is located approx. 123 m to the north of the Project Location at its closest point.

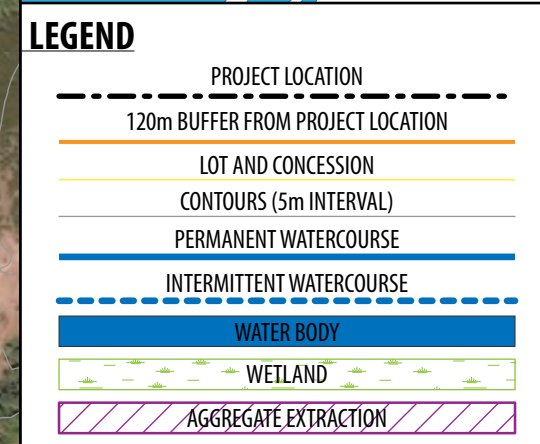
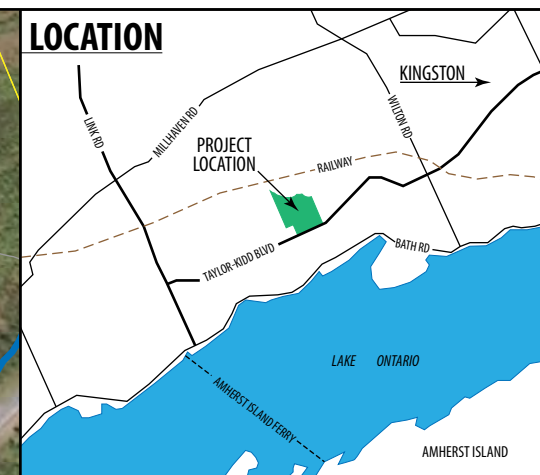
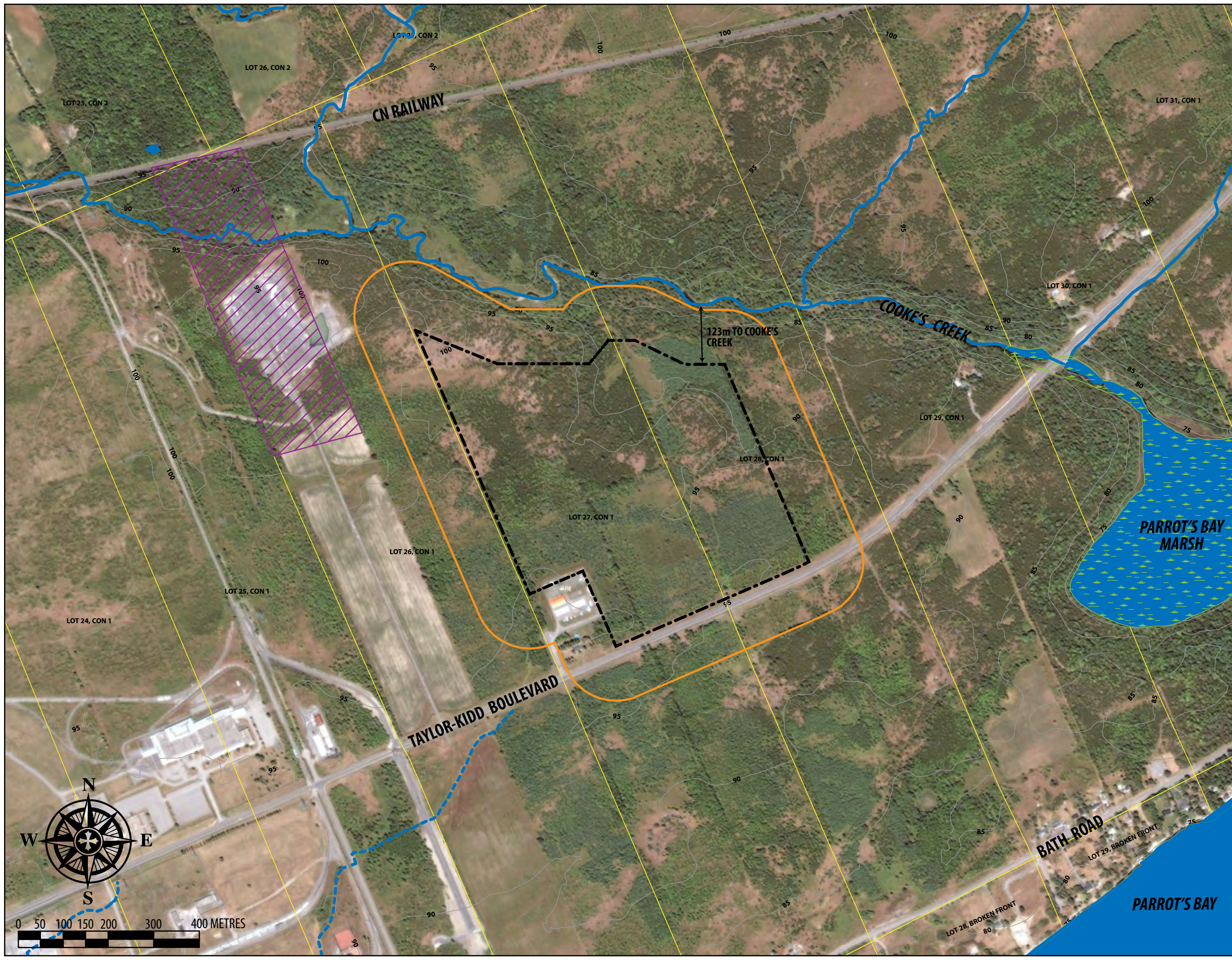
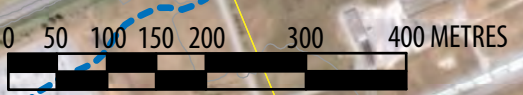


FIGURE 4.1

axiopower



TITLE	NAPANEE TS TAYLOR-KIDD PROJECT BOUNDARIES AND WATER BODY SITE INVESTIGATION	
DATE	JULY 19, 2011	PROJECT No. KP-11-626
		FIGURE

4.2. Water Body Features

4.2.1. Permanent Streams

A permanent stream is considered a water body, and is defined in subsection 1 (1) of the REA Regulation as a “*stream that continually flows in an average year*” (O. Reg. 359/09).

The *Water Body Records Review Report* (Hatch Ltd., 2011) did not identify any permanent streams on or within 120 m of the Project Location. This was confirmed during a site investigation completed on June 17, 2010. Most of the site is represented by conifer plantation and red cedar dominated woodland (Figure 4.2). Cooke’s Creek, a permanent stream, is located approx. 123 m north of the Project Location at its closest point (Figure 4.3).

4.2.2. Intermittent Streams

An intermittent stream is considered a water body, and is defined in Subsection 1 (1) of the REA Regulation as “*a natural or artificial channel, other than a dam, that carries water intermittently and does not have established vegetation within the bed of the channel, except vegetation dominated by plant communities that require or prefer the continuous presence of water or continuously saturated soil for their survival*” (O. Reg. 359/09).

The *Water Body Records Review Report* (Hatch Ltd., 2011) did not identify any intermittent streams on or within 120 m of the Project Location. This was confirmed during a site investigation completed on June 17, 2010.

4.2.3. Lakes

The *Water Body Records Review Report* (Hatch Ltd., 2011) did not identify any lakes on or within 120 m of the Project Location. This was confirmed during a site investigation completed on June 17, 2010.

4.2.4. Seepage Areas

Seepage areas are defined as “*a site of emergence of ground water where the water table is present at the ground surface, including a spring*” (O. Reg. 359/09). The information sources reviewed in the *Water Body Records Review Report* (Hatch Ltd., 2011) did not identify any seepage areas on or within 120 m of the Project Location. This was confirmed during a site investigation completed on June 17, 2010 and April 12, 2011, where no evidence of seepage areas on or within 120 m of the Project Location was found.

4.3. Other Water Features

Other water features that were observed during the site investigation, but do not meet the definition of a water body as outlined in the REA Regulation were considered in this report for the Project Location and 120 m adjacent lands. Accordingly, no other water features were observed within 120 m of the Project location during either of the site investigations on June 17, 2010, or April 12, 2011.



Figure 4.2 Typical thicket and red cedar woodland communities within Taylor Kidd Project Location.



Figure 4.3 Cooke's Creek.

5. Conclusions

Subsection 31 (1) of the REA Regulation requires that the *Water Body Site Investigation Report* include a summary of any corrections to the *Water Body Records Review Report* (Hatch Ltd., 2011), as well as the determinations made as a result of conducting the site investigations. The following table (Table 5.1) identifies the corrections required (if any) and determinations made for the water body features identified in the *Water Body Records Review Report* (Hatch Ltd., 2011) and documented during the site investigations.

Table 5.1 Corrections required to the Taylor Kidd Solar Energy Project Water Body Records Review Report

Determination to be Made	Yes/No	Corrections Required?
Is the Project Location in a water body?	No	There are no corrections required to the <i>Water Body Records Review Report</i> (Hatch Ltd., 2011) with respect to water bodies. The site investigation confirmed that there are no water bodies within 120 m of the Project Location.
Is the Project Location within 120 m of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity?	No	There are no corrections required to the <i>Water Body Records Review Report</i> (Hatch Ltd., 2011) with respect to lakes. The site investigation confirmed that there are no lakes within 120 m of the Project Location.
Is the Project Location within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity?	No	There are no corrections required to the <i>Water Body Records Review Report</i> (Hatch Ltd., 2011) with respect to lake trout lakes. The presence/absence of lake trout lakes is the responsibility of the MNR and is not required for the site investigation.
Is the Project Location within 120 m of the average annual high water mark of a permanent or intermittent stream?	No	There are no corrections required to the <i>Water Body Records Review Report</i> (Hatch Ltd., 2011) with respect to permanent or intermittent streams. The site investigation confirmed that there are no watercourses within 120 m of the Project Location.
Is the Project Location within 120 m of a seepage area?	No	There are no corrections required to the <i>Water Body Records Review Report</i> (Hatch Ltd., 2011) with respect to seepage areas. The site investigation confirmed that there are no seepage areas within 120 m of the Project Location.

As there are no water bodies, watercourses or other water features identified under REA on or within 120 m of the Taylor Kidd Project Location a *Water Body Environmental Impact Study Report* is not required to address potential negative environmental effects.

6. References

Government of Ontario. 2009. Ontario Regulation 359/09 made under the Environmental Protection Act, Renewable Energy Approvals under Part V.0.1 of the Act. September 8, 2009 version. Printed in *The Ontario Gazette*: October 10, 2009. Available on-line at: http://www.elaws.gov.on.ca/html/source/regs/english/2009/elaws_src_regs_r09359_e.htm. Accessed September 15, 2010.

Government of Ontario. 2010. Ontario Regulation 521/10 made under the Environmental Protection Act, Renewable Energy Approvals under Part V.0.1 of the Act. December 15, 2010 version. Printed in *The Ontario Gazette*: January 8, 2011. Available on-line at: http://www.elaws.gov.on.ca/html/source/regs/english/2010/elaws_src_regs_r10521_e.htm. Accessed January, 2011.

Hatch Ltd. 2011. Taylor Kidd Solar Energy Project Water Body Records Review Report. Axio Power Canada Inc. and SunEdison Canada.

Appendix 1. Site Investigation field notes

June 17/10 22C
 Taylor-Kidd Site ~~light~~ 13:30-16:30
 Photo 1 scrub region near ~~high~~-kidd A.
 Ar/E-(Red Cedar) → damp meadow
 scrub - Cor. Vign., Sedge, Grass. similar
 to other sites. but more Red Cedar.
 Drier, Gorkh shale, Orange ~~shales~~
 → some exposed limestone escarpment.
 (Photo 2) - possible milkshake habitat!
 63929/7792

Pr. Ash, Catnip, Timothy, Parsnip
 → following escarpment w. into plantation
 Ow, In. Buckhorn, Frag, Sumac,
 (35cm DBH) Amelanchier sanguinea,
 An, Barren straub. Gal., Herb Robert
 Pr, Sm. Ch. Cherry, Do. Arbutus,
 20 yr. old.
 Plantation → ~~20 yr. old~~ Pr, Sm. RSTO.
 surrounding area dense Red Cedar region
 with patchy open meadow. (Photo 3)
 Teard. Mullen. Red Cedar white Cedar
 Spring Azalea, Yarrow, Tarla, St. Valde.
 B.E. Daphne. Cb. Virg. creeper
 Patchy mixedwood forest @ 6364/54007
 large remnant trees. Ow (55 DBH)
 (30) Barren, Buckhorn understory
 Pr, Ash & mixed scrub. white Cedar
 RIPARIAN EDGE (Photo 4)
 B. B. Fern, Virg. creeper, Pr. Ash
 Smilax, Willow, Podypodys,
 Wood Fern. Tar. ~~shales~~
 limestone escarpment borders creek
 Aquilegia, H. Ash, An

20 Location Taylor Kidd Date Apr 12/11
Project / Client Axio
B/C 11:45 - 12:45 cloud/sun
→ investigate potential hibernacula
& look for rattler nesting.
SURVEYORS: Dave Kristensen
Rob Smetaninger
→ escarpment priced surveilled
across pool location
→ no snakes
→ most one North Facing
→ no frogs