



Archaeological Overview Assessment
RPA 1716: Terra Nova National Park Utility Systems Recapitalization
Terra Nova National Park (Newfoundland and Labrador)
Funding: To Be Determined

Prepared By: J. Higdon, Archaeologist, IACH Directorate
Date: May 15, 2019

1. Purpose

To conduct an archaeological overview assessment of Terra Nova National Park (NP) Utility Systems Recapitalization Project (RPA 1716). This large recapitalization project encompasses the following four large infrastructure projects: 1) Newman Sound Campground Underground Electrical Primary Recap; 2) Newman Sound Admin building to Maintenance Compound Water & Wastewater Recap; 3) Newman Sound Campground Water, Wastewater & Water Storage Tank Recap; 4) Malady Head Campground Wastewater Recap. In addition to summarizing the objectives of each project, this assessment will take into account existing archaeological data and the archaeological potential of each area to determine potential impacts on surface and sub-surface cultural resources.

2. Background

Terra Nova National Park is situated on the northern coast of the Island of Newfoundland and has a cultural history stretching back more than 5000 years. As of Sept 2017, thirty-two known archaeological sites have been documented within the park limits (Higdon *in progress*). They represent Maritime Archaic, Paleoeskimo, Recent Indian occupations, as well as more recent European operations, including numerous 20th century forestry/sawmill related sites. While these sites are predominately located along the coast, recent surveys have shown there are also numerous sites in the interior of the park, along its rivers and ponds. A lack of known archaeological sites in a particular area does preclude the existence of archaeological sites in that area, it may simply be a function of whether or not that area had previously been systematically surveyed by an archaeologist.

3. Project Introduction and Objectives

According to the Request for Cultural Resource Impact Analysis (CRIA),

Terra Nova National Park is currently relying on 45+year-old utility systems which are beyond life expectancy. The utility systems include water distribution systems, waste water collection systems and a combination of underground/over ground primary electrical systems. The water treatment system from raw water to potable water including the Headquarter Pumphouse and Newman Sound trailer sanitary dumping station have been completely recapitalized via FII. Upon completion of the aforementioned, the Field Unit is now focused on recapitalizing the remaining TNNP utility system



infrastructure that includes, potable water distribution system and waste water collection system throughout the entire of TNNP coupled with the primary electrical feeder systems throughout Newman Sound Campground. The proposed project will be implemented over four years to minimize interruptions to campground services and address assets in order of condition and priority. This project objective is a three step planning approach beginning with the now completed condition assessments, concepts, pre-design and 100% tender ready packages for the aforementioned areas. This will be followed by phasing the tendering and complete replacement of the existing water distribution systems, sanitary sewage collection and treatment systems and primary electrical feeder systems in Newman Sound Campground. Finally, rehabilitation of any disturbed areas.

Parks Canada 2019:1

The Request for CRIA explicitly states that “the footprint of the excavations will be limited to previously disturbed areas, where possible” and construction will be scheduled to commence when they receive project funding (Parks Canada 2019:1).

A review of the background information provided with the Request for CRIA indicates that the Terra Nova NP Utility Systems Recapitalization Project encompasses the following four large scale infrastructure projects (Figure 1, Table 1):

Table 1: Terra Nova NP Utility Systems Recap Projects.

Project Name	Reference Document
Newman Sound Campground Underground Electrical Primary Recap	15003 - Newman Sound Campground Underground Electrical Primary Recap.pdf
Newman Sound Admin building to Maintenance Compound Water & Wastewater Recap	15003-20 - 100% CLIENT REVIEW - 03-29-29.pdf
Newman Sound Campground Water, Wastewater & Water Storage Tank Recap	15003-21-CVR-DW04 100% Client Review.pdf
Malady Head Campground Wastewater Recap	15003-23 - 100% CLIENT REVIEW - 03-29-29.pdf

While there is overlap in many of the project areas, each project will described and assessed separately with archaeological recommendations and requirements summarized in Section 4.

3.1 Newman Sound Campground Underground Electrical Primary Recapitalization (Figure 2)

Reference Document: 15003 - Newman Sound Campground Underground Electrical Primary Recapital...pdf (Crandall 2019c).

This Newman Sound Campground Underground Electrical Primary Recapitalization portion of the project involves the removal of existing underground cable and infrastructure, as well the as the installation of new underground cables. Installation of new underground cables require the excavation of trenches a



minimum of 0.4m – 0.7m wide and a minimum average 1.25m deep. See Project Drawings 15003-22, Drawing Number E14 (Crandall 2019c) for more details. Table 2 highlights the activities that will have an impact on the ground surface / sub-surface. Figure 2 highlights the areas in which these activities will impact previously undisturbed areas of the park.

Table 2: Summary of Newman Sound Campground Underground Electrical Primary Recap Activities, comments and AIA Recommendations (Crandall 2019c)

Sheet	Activity Impacting Ground Surface / Sub-Surface	Comments	AIA Required?
E02, E03, E04	Removal of existing underground cable and infrastructure	Occurring within disturbed areas / existing roadway.	No
E05	Removal of existing Transformer	Existing underground wiring is to remain in place. While the area has archaeological potential due to its proximity to the shore, the work appears to be within the previously disturbed areas.	No
E06	Installation of new underground cable. (Figure 3)	Bulk of work occurring within previously disturbed area / existing roadway, with the exception of the underground cable (4160) highlighted in Figure 3. Comparison of plans with satellite imagery suggests that this may be a parking lot / an area that has been previously disturbed	Yes. Site Visit to see if judgemental test pitting is required.
E07	Installation of new underground cable. (Figure 4)	Bulk of work occurring within previously disturbed area / existing roadway, with the exception of the underground cable (4160) highlighted in Figure 4. Comparison of plans with satellite imagery suggests that this may be a parking lot / an area that has been previously disturbed. This area is approximately 250m west of the shores of Newman Sound.	Yes. Site Visit to see if judgemental test pitting is required.
E08	Installation of new underground cable.	Bulk of work occurring within previously disturbed area / existing roadway, with the exception of one portion of 600 underground cable..	No
E09	Installation of new transformer.	While the area has archaeological potential due to its proximity to the shore, the work appears to be within the previously disturbed areas.	No

In sum, while some of the project areas are within 250m of Newman Sound, the bulk of the proposed work is set to occur within previously disturbed areas associated with existing power lines, related infrastructure and roadways. **An archaeological impact assessment is required, as two areas shown on E06 and E07 (Figures 2, 3 & 4) have been highlighted as areas of moderate potential. A site visit is required to determine if test pitting is needed.**

3.2 Newman Sound Administration Building to Maintenance Compound Water & Wastewater Recapitalization

Reference Document: 15003-20 - 100% CLIENT REVIEW - 03-29-29.pdf (Crandall 2019a)



The Newman Sound Administration Building to Maintenance Compound Water & Wastewater Recapitalization project involves work in three locations: 1) Maintenance Compound; 2) Administration Head Quarters and Eco-Science Centre; and the 3) Housing Area (Figure 5). This project involves the replacement of septic fields and lines, watermains, chain link fences, concrete pads, and other related infrastructure, including new asphalt. The proposed impacts of the work in these project areas is low because much of the project footprints lie within previously disturbed areas. **An archaeological impact assessment is not needed for activities associated with this portion of the overall project.**

3.3 Newman Sound Campground Water, Wastewater & Water Storage Tank Recapitalization

Reference Document: 15003-21-CVR-DW04 100% Client Review.pdf (Crandall 2019d)

The Newman Sound Campground Water, Wastewater & Water Storage Tank Recapitalization can be further divided into two main projects. They include: 1) Sanitary Sewer (Sheets CS01-CS17, DS01-DS05 & MS01) and, 2) Watermains (CW01-CW42 & DW01 – DW04). While there is some overlap between the two, due to the volume of plans, each will be discussed separately.

3.3.1 Sanitary Sewer Infrastructure

While most of the lines associated with the sanitary sewer infrastructure lie within footprint of the existing roadways and sewer infrastructure, the following table highlights areas that required additional analysis. New sanitary sewer line and combination watermain and sanitary sewer line installations require excavation of trenches approx. 2 meters wide and 2-3 m deep. Septic Fields are excavated to a depth of an average of 2.0m. Discussions about specific installations are summarized in Table 3.

It is worth noting that there is an issue with the numbering of some of the sheets in the document. Drawing CS11 in Overall Site Plan (CS01) is labelled as 11 15003-21D-CS11 in the pdf table of contents, but CS10 on the sheet itself.



Table 3: Summary of Newman Sound Campground Sanitary Sewer Infrastructure Recap Activities, comments and AIA Recommendations (Crandall 2019d) (Figure 6)

Sheet	Activity Impacting Ground Surface / Sub-Surface	Comments	AIA Required?
CW06	PVC Sanitary Pipe	Adjacent to existing waterline.	No
CS10 / CS11	New Watermain and Sanitary force main (~70m) (Figure 7)	Located 6m southeast of campground trail / parking lot. Unclear if this area was grubbed/graded as part of the construction of this campground / picnic area. Less than 50m west of Newman Sound.	Yes. Site Visit to see if judgemental test pitting is required.
CS12	New Septic Field (~20x25m)	~700m west of shoreline. Approx. 75% of the proposed field overlaps existing field, to be replaced, as needed. Area seems to have been disturbed with construction of existing field.	No
CS13	New Septic Field (~ 12x12m)	Over existing seepage pit. While the proposed area is over twice the size of the old pit, excavation in proximity to the septic area may pose health risks.	No
CS14	New Septic Field (~ 20 x 20m) & New Line (~ 40m) (Figure 8)	Located in seemingly undisturbed area.	Yes. Site Visit to see if judgemental test pitting is required.
CS15	New Septic Field (~ 20 x 25m) & new lines (~30m) (Figure 9)	Located in seemingly undisturbed area.	Yes. Site Visit to see if judgemental test pitting is required.
CS16	New Septic Field (~25x40m) & new lines (~40m)	New Septic Field atop existing septic field. Area disturbed. While one new line appears to be in an undisturbed area, the slope suggests that this area is of lower archaeological potential. The remaining sections of the line intersect previously disturbed areas.	No
CS17	New Septic Field (~15x25) (Figure 10)	South half overlaps with existing septic field.	Yes. Site Visit to see if judgemental test pitting is required.

3.3.2 Watermain Infrastructure

In an effort to reduce impacts to undisturbed areas of the park, the bulk of the watermain related infrastructure work has been planned to fall within previously disturbed areas associated with existing roadways and watermain trenches (Figure 11). That being said, there are still a number of areas where undisturbed ground will have to be excavated for the installation of watermain pipes and fireboxes. New watermain pipes require excavation of trenches approximately 2 meters wide and 2-3 m deep. Fireboxes require the installation of a 1.5m x 0.75m x 0.15m concrete slab and pipe connecting to watermain at a depth of a minimum of 0.6m (Crandall 2019d).



While any undisturbed area has some potential for unknown archaeological resources, areas within 300m of the ocean have been flagged as having moderate and high archaeological potential (Figures 11 & 12, Table 4)

Table 4: Summary of impacts that Watermain related excavations may have on surface and sub-surface cultural resources (Crandall 2019d).

Sheet	Activity Impacting Ground Surface / Sub-Surface (approx. length)	Comments	AIA Required?
CW23	Watermain (60m) and Firebox (Figure 13).	Moderate archaeological potential. <250m west of Newman Sound.	Yes. Site Visit to see if judgemental test pitting is required.
CW26	Watermain & Forcemain (75m, 20m, 20m, 40m), and 2 Fireboxes (Figure 14).	High archaeological potential. Located at the Day Use Area, southeast of the trail and parking lot and 20-40m east of Newman Sound. Portions of proposed work lie outside of existing watermain footprint. That being said, this area could have been grubbed during the levelling of the area for use as a day use area. <i>The areas of concern in this area overlap with the areas of concern listed in Table 3, Sheet CS10 / CS11.</i>	Yes. Site Visit to see if judgemental test pitting is required.
CW27	Watermain (2 x 50m, 2 x 20m, 10m) and 4 Fireboxes (Figure 15).	Moderate archaeological potential. ~250m west of Newman Sound	Yes. Site Visit to see if judgemental test pitting is required.
CW28	Watermain/water service (3 x 30m, 3 x 40m, 50m, 100m) & Fire Box; 4 Fireboxes (Figure 16).	Moderate archaeological potential. ~250m west of Newman Sound	Yes. Site Visit to see if judgemental test pitting is required.
CW33	Watermain/water service (2x 10m, 20m, 30m, 40m, 60m), Sanitation line (30m), Power line (20m) & 6 Fire boxes (Figure 17).	Moderate archaeological potential. ~250m west of Newman Sound	Yes. Site Visit to see if judgemental test pitting is required.
CW34	Watermain/water service (20m, 2 x 30m, 3 x 50m, 60m), Sanitation line (90m) & 4 fire boxes (Figure 18).	Moderate archaeological potential. Less than 250m west of Newman Sound.	Yes. Site Visit to see if judgemental test pitting is required.



3.4 Malady Head Campground Wastewater Recapitalization

Reference Document: 15003-23 - 100% CLIENT REVIEW - 03-29-29.pdf (Crandall2019a)

Located at the northern extent of the park, Malady Head Campground is situated 4.0km northeast of where Highway 30 intersects the Trans-Canada Highway and 2km southeast of Traytown (Figures 1 & 19). The Malady Head Campground Wastewater Recapitalization project can be broken down into three main areas. They will involve excavations associated with the installation of:

- 1) Sewer lines within existing roadways and sewer line related trenches (Crandall2019a:CS02 – CS06);
- 2) New Raised Sanitary Disposal Field at northeastern extent of the campground area (Crandall2019a: CS02);
- 3) New Septic Field Associated with Existing Kitchen Shelter (Crandall2019a: CS06);
- 4) New washroom buildings and septic tank at the day use area located along the shores of Beach Cove (Crandall2019a: CS07).

3.4.1 Sewer lines within existing roadways and sewer line related trenches (Crandall2019a: CS02-CS06)

Excavations associated with the replacement / installation of sewer lines within existing roadways and sewer line related trenches have already been assessed as part of the *Archaeological Overview Assessment for RPA 601: Malady Head Campground Water Distribution System Recapitalization (Higdon 2017)*.

During a brief visit to the project area in May 2016, Resource Management Officer, Rod Cox, indicated that the waterline upgrades would largely be confined to areas beneath the existing roadways and along areas with existing pipes (Figure 2). Not only does this reduce the footprint of the project, but it coincides with Visitor Experience recommendations to avoid unnecessary disturbing vegetated areas between campsites. In areas where the previous pipes cut through the forest, Cox indicated that efforts will be made to have the waterlines follow along the existing roadways, where possible (Pers. Comm. 2016).

Higdon 2017: 2

Given that the Request for CRIA indicates that they are keeping within the confines of previously disturbed zones, based on previous conversations and drawings, it is reasonable to assume that the same actions will be taken for the installation of the sewer lines outlined in the Malady Head Campground Wastewater Recapitalization Project. **An Archaeological Impact Assessment is not required for this portion of the project.**

3.4.2 New Raised Sanitary Disposal Field at northeastern extent of the campground area (Crandall2019a: CS02)

A New Raised Sanitary Disposal Field is proposed for the northeastern extent of the Malady Head Campground Area (Figure 19 & 20). Located approximately 220 m away from the ocean, the proposed disposal field will be approximately 20m x 50m and excavated at a depth of 2-3 meters. A review of the plans suggests that the southern two thirds of the project footprint overlays the existing sewage trickling



plant and parking area. The profile of the project footprint, detailing existing ground surface and extent of excavations indicates that this disposal field will be built along an existing slope. While this area is of low archaeological potential, it will involve excavation in previously undisturbed areas. **An Archaeological Impact Assessment in the form of a site visit to determine if judgmental test pitting is required.**

3.4.3 New Septic Field Associated with Existing Kitchen Shelter (Crandall2019a: CS06)

Drawing CS06 shows the proposed location of a new 2300L septic tank and related system to the north of the existing kitchen shelter (Figure 21). Excavation associated with the septic tank and associated infiltrators and distribution box will impact an area approximately 10m x 20m and 2-3m deep. While this area is of low archaeological potential, it will involve excavation in previously undisturbed areas. **An Archaeological Impact Assessment in the form of a site visit to determine if judgmental test pitting is required.**

3.4.4. New washroom buildings and septic tank at the day use area located along the shores of Burnt Point / Beach Cove (Crandall2019a: CS07).

Located within 40m of the current beach, this portion of the project includes the removal of existing washroom / outhouse buildings and the installation of a new washroom building and associated septic tank system (Figure 22). While the specific dimensions of the washroom facility have not been given, the drawings show an area approximately 10m x 10m. A sewage pipe connects the facility to a 2300L septic tank and associated 10m x 20m septic field containing infiltrators and a distribution box. Excavations for the septic tank and infiltrators involve excavations at depths of 2-3m.

The general area associated with the proposed new washroom facilities and associated septic tank system is of **high archaeological potential**. While the likelihood of locating intact cultural features and deposits in this area may be reduced because of construction associated with existing washroom infrastructure, **an archaeological impact assessment is required to determine if judgemental testing is needed. Also more information about the nature and extent of washroom building is needed to complete this portion of the AOA.**

4. Archaeological Requirements

4.1 Archaeological Impact Assessments (AIA) are required for project activities that intersect previously undisturbed areas.

The required AIA can be broken down into two main categories. 1) High Archaeological Potential Areas that require site visit and test pitting, and 2) Moderate Archaeological Potential Areas that require a site visit to determine if the test pitting is required.

4.1.1 High Archaeological Potential Areas that require site visit and test pitting

There are two main areas that are of high archaeological potential because of their proximity to the ocean. While some areas may have been cleared and grubbed in the past, test pitting is required to determine whether or not there are cultural resources in these areas. The two areas of note include:



4.1.1.1 Newman Sound Campground Day Use Area

- **Project:** Newman Sound Campground Water, Wastewater & Water Storage Tank Recap (Crandall 2019c)
- **Summary:** Watermain, sanitary force main and fire boxes to be installed in previously undisturbed area.
- Project activities are outlined in section 3.3; Crandall 2019c: CS10/11 (Table 3, Figure 7) and Crandall 2019c:CW26 (Table 4, Figure 14).

4.1.1.2 Malady Head Campground Wastewater Recap at Burnt Point Day Use Area.

- **Project:** Malady Head Campground Wastewater Recap Newman Sound ([Crandall2019a](#))
- **Summary:** Installation of new washroom building and septic day at Burnt/Point / Beach Cove Day Use area (Figure 22).
- Project Activities are outlined in Section 3.4.3 and Crandall 2019, Sheet CS07 (Figure 22).
- **More information about the nature and extent of washroom building is needed to complete this portion of the AOA.**

4.1.2 Moderate Potential Areas that require site visits to determine if test pitting is required.

While these areas are not of as high archaeological potential as those within 100m of the coast, site visits are required in the following areas to determine if test pitting is required (Sorted By Section / Project and Project Drawing):

Section 3.1-Newman Sound Campground Underground Electrical Primary Recap ([Crandall2019b](#))

- E06 - Installation of new underground cable (Table 2, Figure 3).
- E07 - Installation of new underground cable (Table 2, Figure 4).

Section 3.3 - Newman Sound Campground Water, Wastewater & Water Storage Tank Recap ([Crandall2019c](#))

[Section 3.3.1 Sanitary Sewer Infrastructure](#)

- CS14 - New Septic Field & Waterline (Table 3, Figure 8).
- CS15 - New Septic Field & Waterline shown in CS15 (Table 3, Figure 9).
- CS17 - New Septic Field (north half) shown in CS17 (Table 3, Figure 10).

[Section 3.3.2 Watermain Infrastructure](#)

- CW23 - Watermain and Firebox installation (Table 4, Figure 13).
- CW27 - Watermain and firebox installation (Table 4, Figure 15).
- CW28 - Watermain / water service & Fire Box (Table 4, Figure 16).
- CW33 - Watermain / water service, sanitation line, power line and fireboxes (Table 4, Figure 17).
- CW34 - Watermain / water service, sanitation line and fireboxes (Table 4, Figure 18).



Section 3.4 - Malady Head Campground Wastewater Recap Newman Sound (Crandall2019a)

- CS02 - New raised sanitary disposal field at northern eastern extent of campground area (Section 3.4.2, Figure 20).
- CS06 - New septic field associated with existing kitchen shelter (Section 3.4.3, Figure 21).

The work must be undertaken by a qualified archaeologist with an approved Research and Collections Permit issued by the Field Unit research coordinator. The work will be completed in two phases. The first phase is field reconnaissance to delineate high potential areas within the project area, and the second phase is shovel test pitting to a sterile level (undisturbed glacial soil or beach pebbles/cobble. In identified high potential zones (water crossings, areas adjacent to watercourses, plateaus) the tests will occur at 5m intervals while testing in lower potential zones will be at 10m intervals.

The utility systems recapitalization excavations and development activities are restricted to areas presented in the design concept. If landscaping is required beyond these excavation limits, please consult with Parks Canada's Terrestrial Archaeology section to determine if an additional AOA is required for these activities. Based on the AOA, an AIA and/or additional mitigation measures may be required prior to the continuation of excavation activities.

4.2 Archaeological Impact Assessments (AIA) are NOT required for excavations that explicitly fall within the footprint of existing roadways and trenches associated with the following projects:

- Newman Sound Campground Underground Electrical Primary Recap (Crandall2019c).
- Newman Sound Admin building to Maintenance Compound Water & Wastewater Recap (Crandall2019b)).
- Newman Sound Campground Water, Wastewater & Water Storage Tank Recap (Crandall2019d).
- Malady Head Campground Wastewater Recap Newman Sound (Crandall2019a).

Only the areas discussed in Section 4.1 and 4.2 require archaeological impact assessments.

The utility systems recapitalization excavations and development activities are restricted to areas presented in the design concept. If landscaping is required beyond these excavation limits, please consult with Parks Canada's Terrestrial Archaeology section to determine if an additional AOA is required for these activities. Based on the AOA, an AIA and/or additional mitigation measures may be required prior to the continuation of excavation activities.

While an AIA is not required in these areas, there could be a chance, however low, that cultural resources, such as features or artifact concentrations may be encountered during construction activities. If cultural resources features, are encountered, work should cease in the immediate area. The work area in relation to the findings photo documented and geo-referenced, and the Parks Canada project manager informed. The project manager should then contact Parks Canada's Terrestrial Archaeology section for advice and assessment of significance, which will in turn determine what will be required to mitigate the chance find.



5 Contacts

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6 REFERENCES

Crandall

2019a Malady Head Campground Wastewater Recapitalization Glovertown, NL (PCA Project No. 15003-23). Electronic Document: 15003-23 - 100% CLIENT REVIEW - 03-29-29.pdf. Prepared for and on file with Parks Canada, Terra Nova National Park, Glovertown, NL.

2019b Newman Sound Administration Building to Maintenance Compound Water & Wastewater Recapitalization Glovertown, NL (PCA Project No. 15003-20). Electronic Document: 15003-20 - 100% CLIENT REVIEW - 03-29-29.pdf. Prepared for and on file with Parks Canada, Terra Nova National Park, Glovertown, NL.

2019c Newman Sound Campground Underground Electrical Primary Recapitalization (PCA Project No. 15003-22). Electronic Document: 15003 - Newman Sound Campground Underground Electrical Primary Recapital....pdf. Prepared for and on file with Parks Canada, Terra Nova National Park, Glovertown, NL.

2019d Newman Sound Campground Water, Wastewater & Water Storage Tank Recapitalization Glovertown, NL (PCA Project No. 15003-21). Electronic Document:



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Heritage Foundation of Terra Nova National Park

n.d. Map. *Electronic Document* <http://www.hftnnp.ca/map/>. Accessed May 17, 2019.

Higdon, John

2017 Archaeological Overview Assessment for RPA 601: Malady Head Campground Water Distribution System Recapitalization. On file with Parks Canada, Terrestrial Archaeology Branch, Dartmouth, NS.

In Archaeological Impact Assessments and Test Excavations in Terra Nova National Park 2016. On file with Parks Canada, Terrestrial Archaeology Branch, Dartmouth, NS.

5. Figures

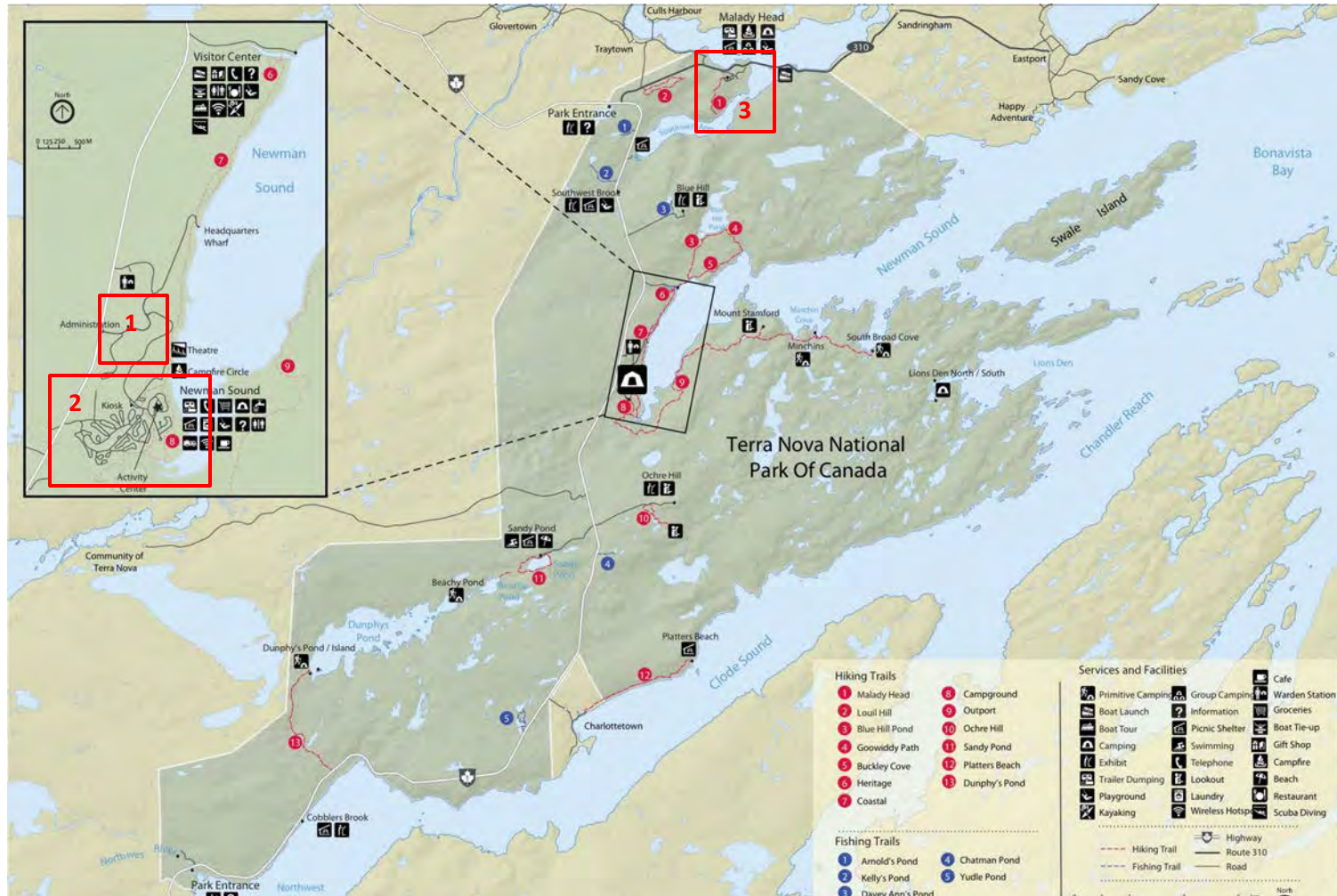


Figure 1: Map of Terra Nova National Park showing locations of projects. 1) Newman Sound Administration 2) Newman Sound Campgrounds, 3) Malady Head Campground (Heritage Foundation of Terra Nova National Park n.d.).



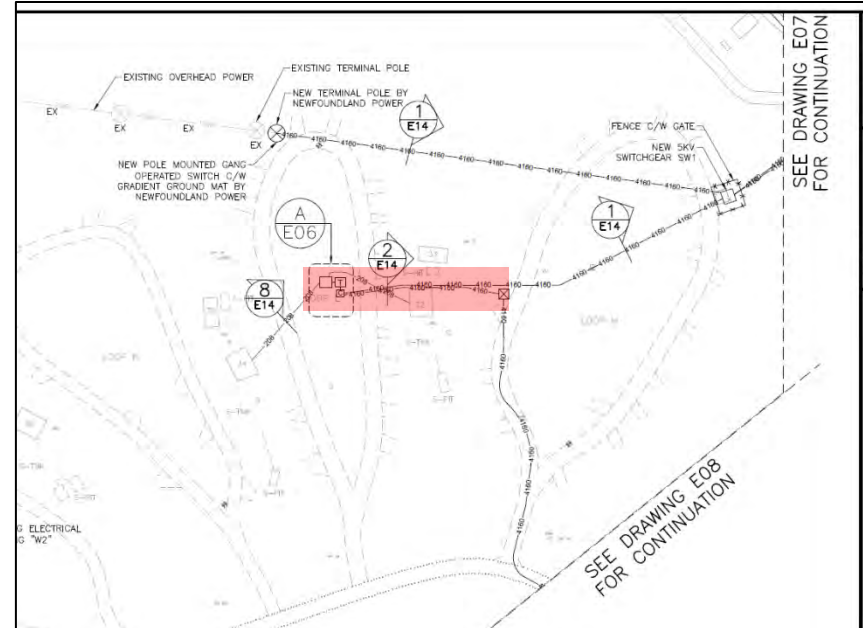
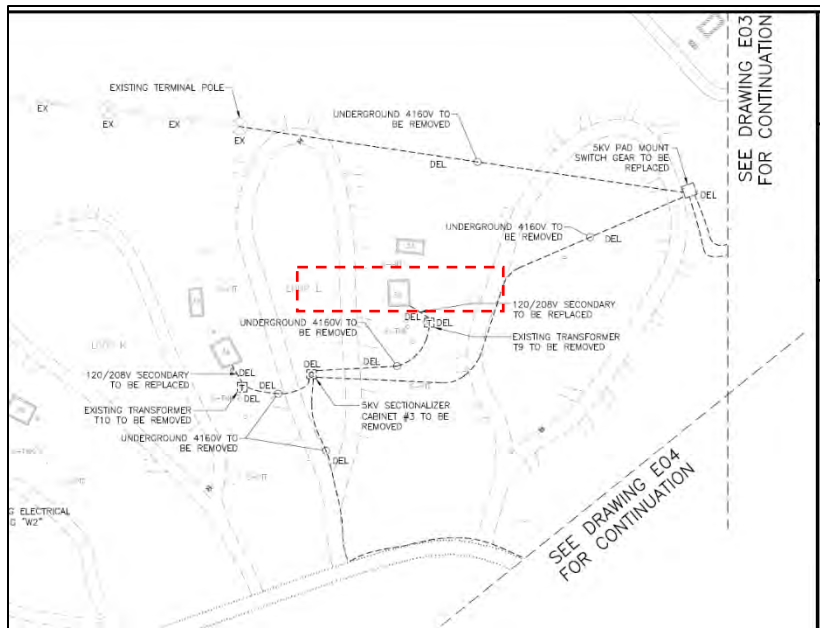


Figure 3: Newman Sound Campground Underground Electrical Primary Recapitalization. Left: Location of existing underground cables (Sheet E02) with dashed box showing area void of existing underground cables. Right: Proposed location of new underground cable and transformer pad installation (Sheet E06) with red rectangle shows proposed excavations in previously undisturbed area (Crandall 2019c).



Figure 4: Newman Sound Campground Underground Electrical Primary Recapitalization. Left: Area in Sheet E07 showing the installation of new underground cable outside existing roadway. Right: Google Earth image of same area showing the approximate location of project activity area (Crandall 2019c).





RPA 1716: Terra Nova NP Utility Systems Recapitalization AOA

J Higdon (May 2019)

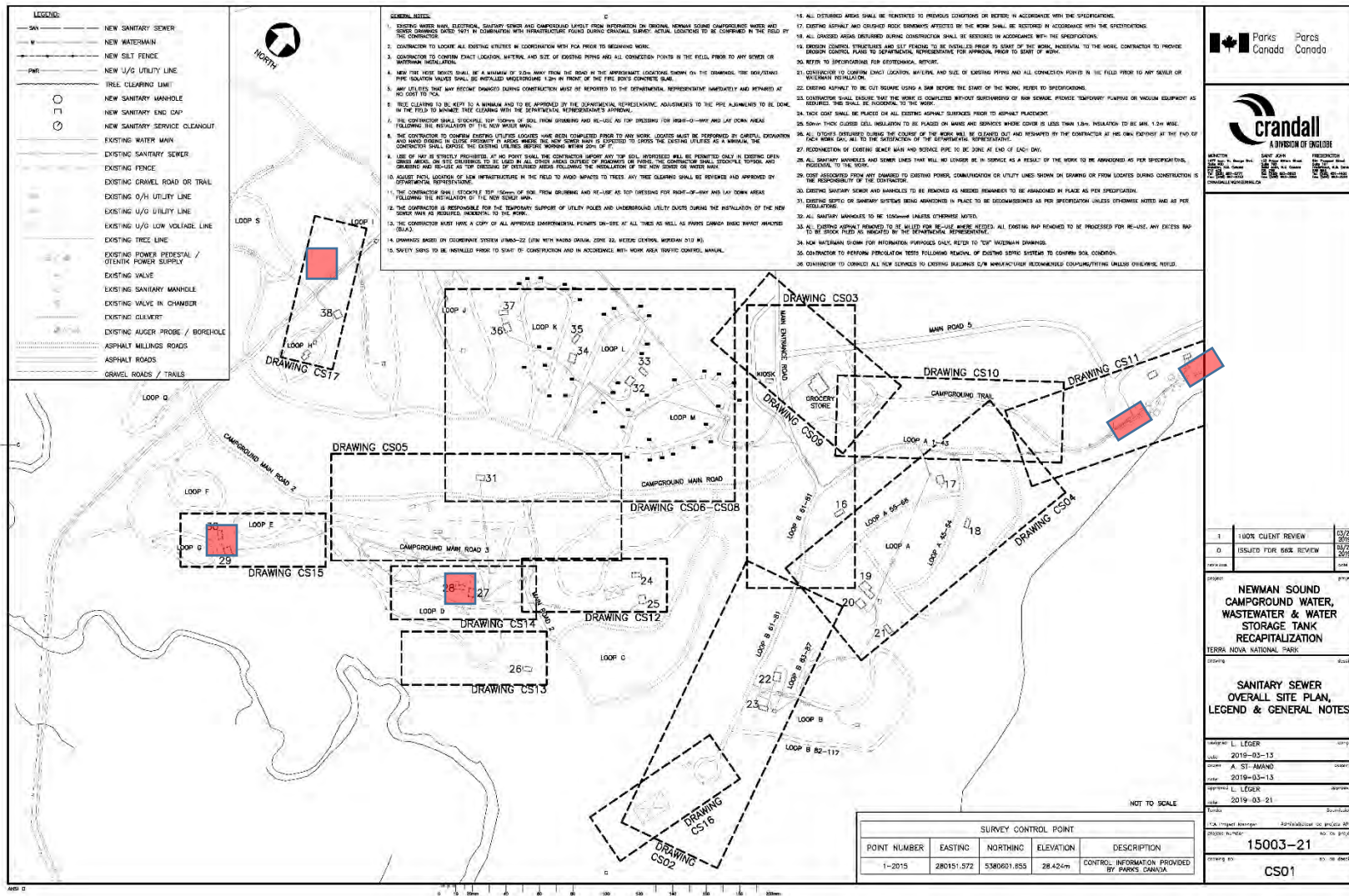
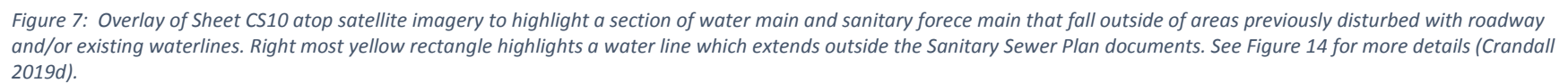


Figure 6: Newman Sound Campground Water, Wastewater & Water Storage Tank Recapitalization – Sanitary Sewer Overall Site Plan, Legend and General Notes. Red rectangles highlight approximate areas of interest. (Crandall 2019d:CS01)





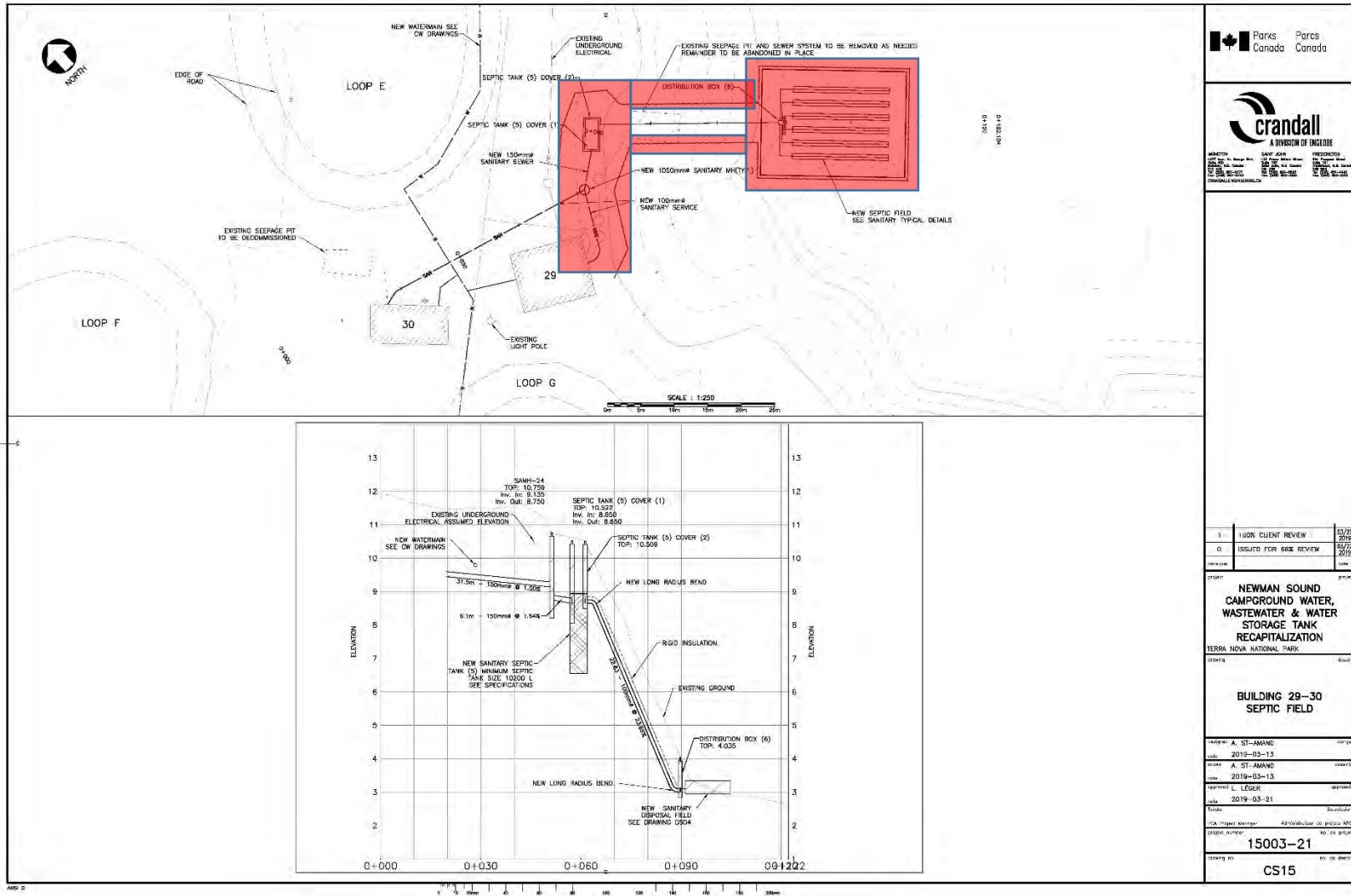


Figure 9: New septic field and related lines. Red rectangles highlight project areas outside disturbed roadway and other previously disturbed areas (Crandall 2019d: CS15).



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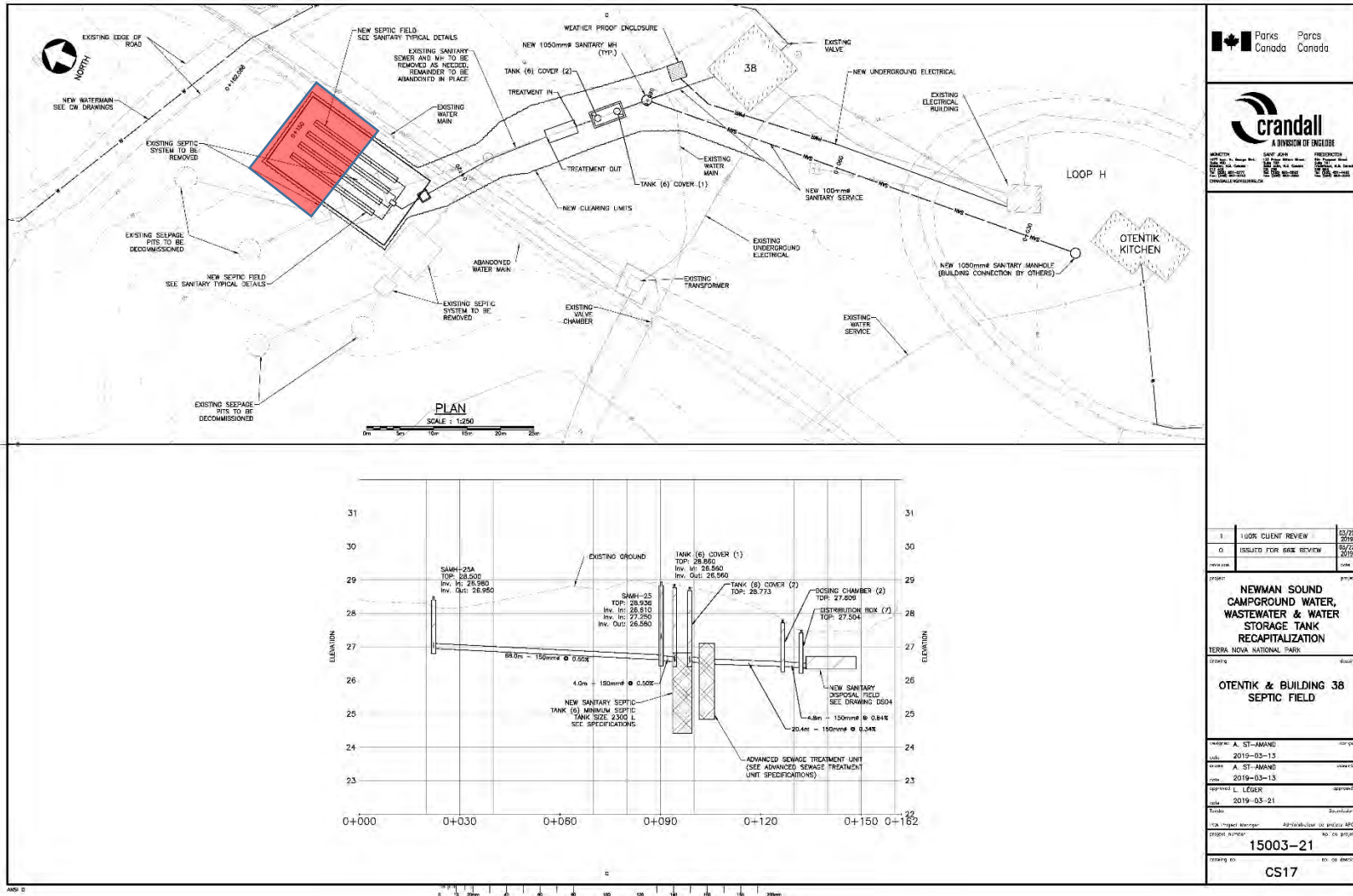


Figure 10: New septic field and related lines. Red rectangles highlight project areas outside disturbed roadway and other previously disturbed areas (Crandall 2019d: CS17).



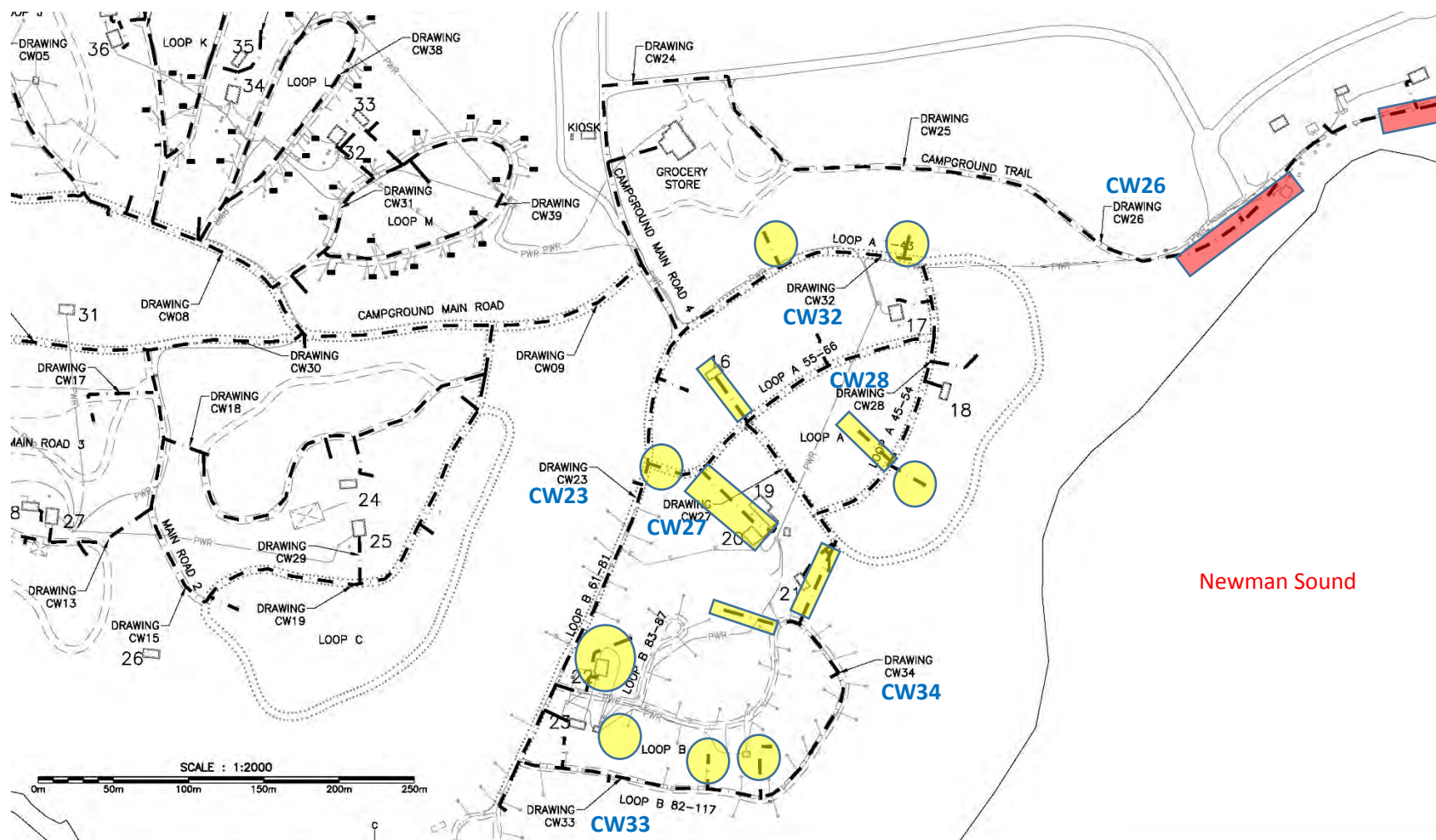


Figure 12: Watermain Overall Site Plan (Newman Sound Campground Water, Waterwater & Water Storage Tank Recapitalization) (Crandall 2019d: CW01). Close up of areas of archaeological potential areas. Red = High, Yellow = Moderate.

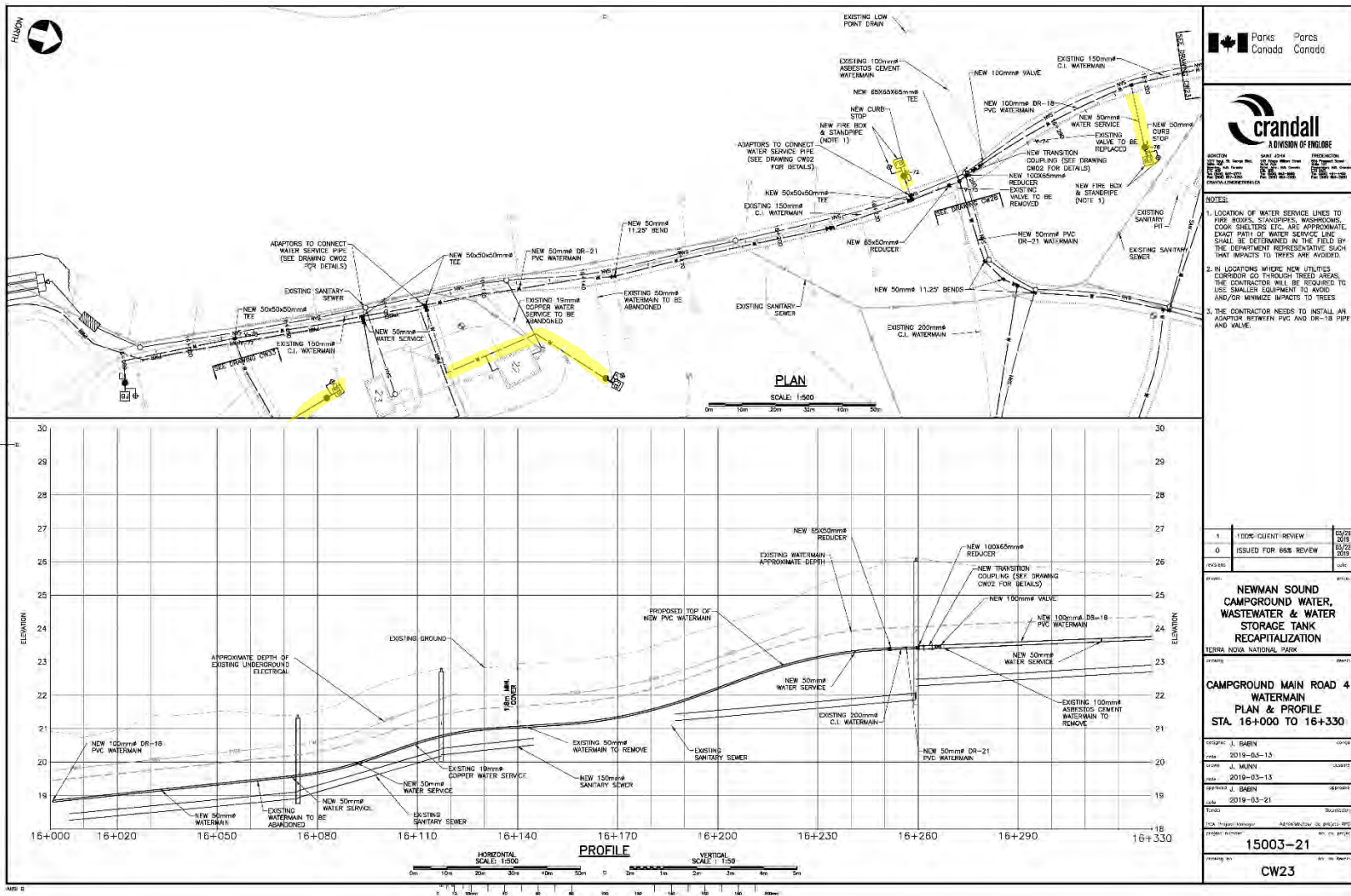


Figure 13: Campground Main Road 4 Watermain Plan and Profile. Yellow lines highlight proposed excavations in undisturbed locations of moderate archaeological potential. (Crandall 2019d: CW23)



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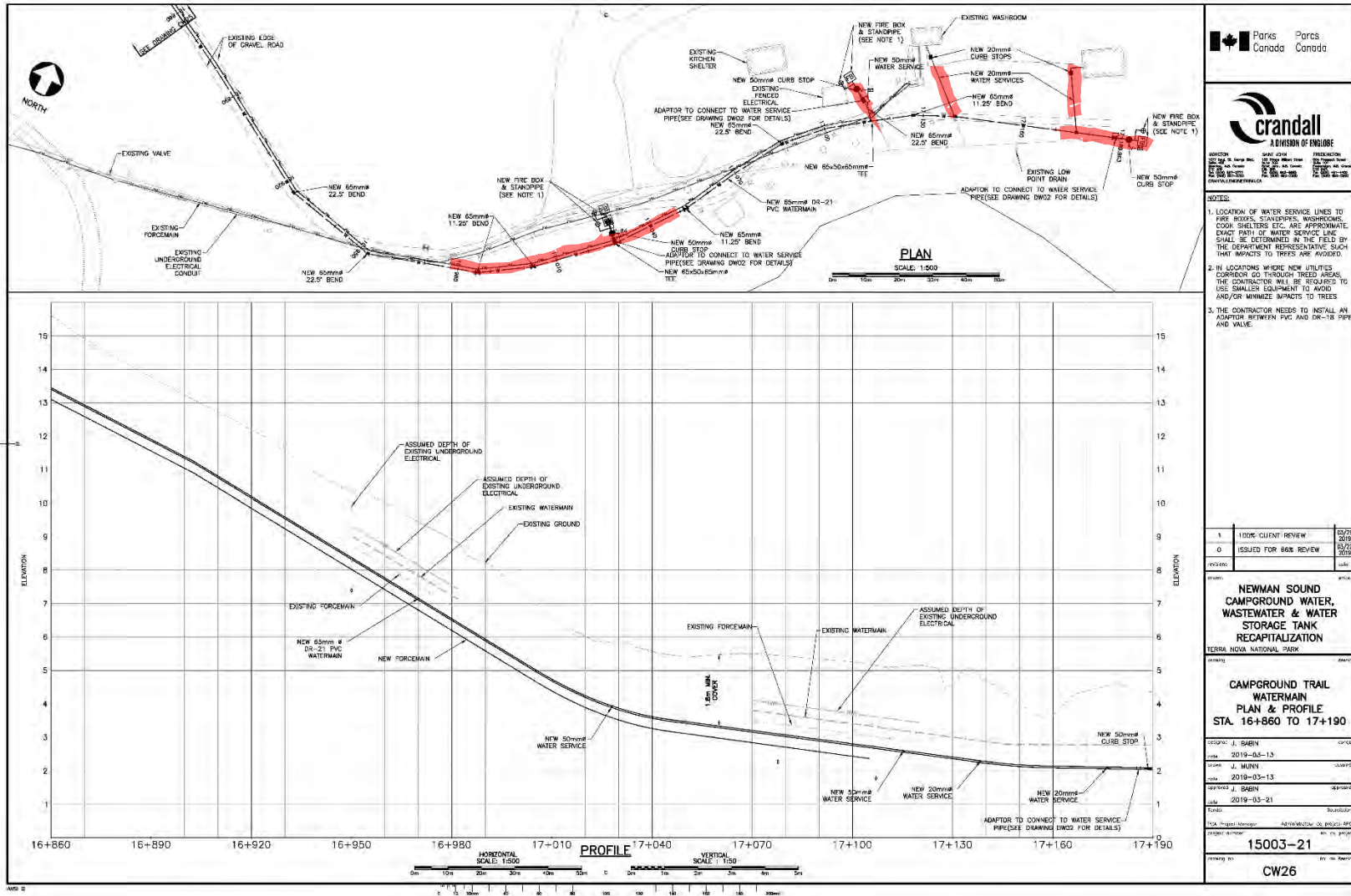


Figure 14: Campground Trail Watermain. Red lines highlight proposed excavations in undisturbed locations of low archaeological potential. (Crandall 2019d: CW26)



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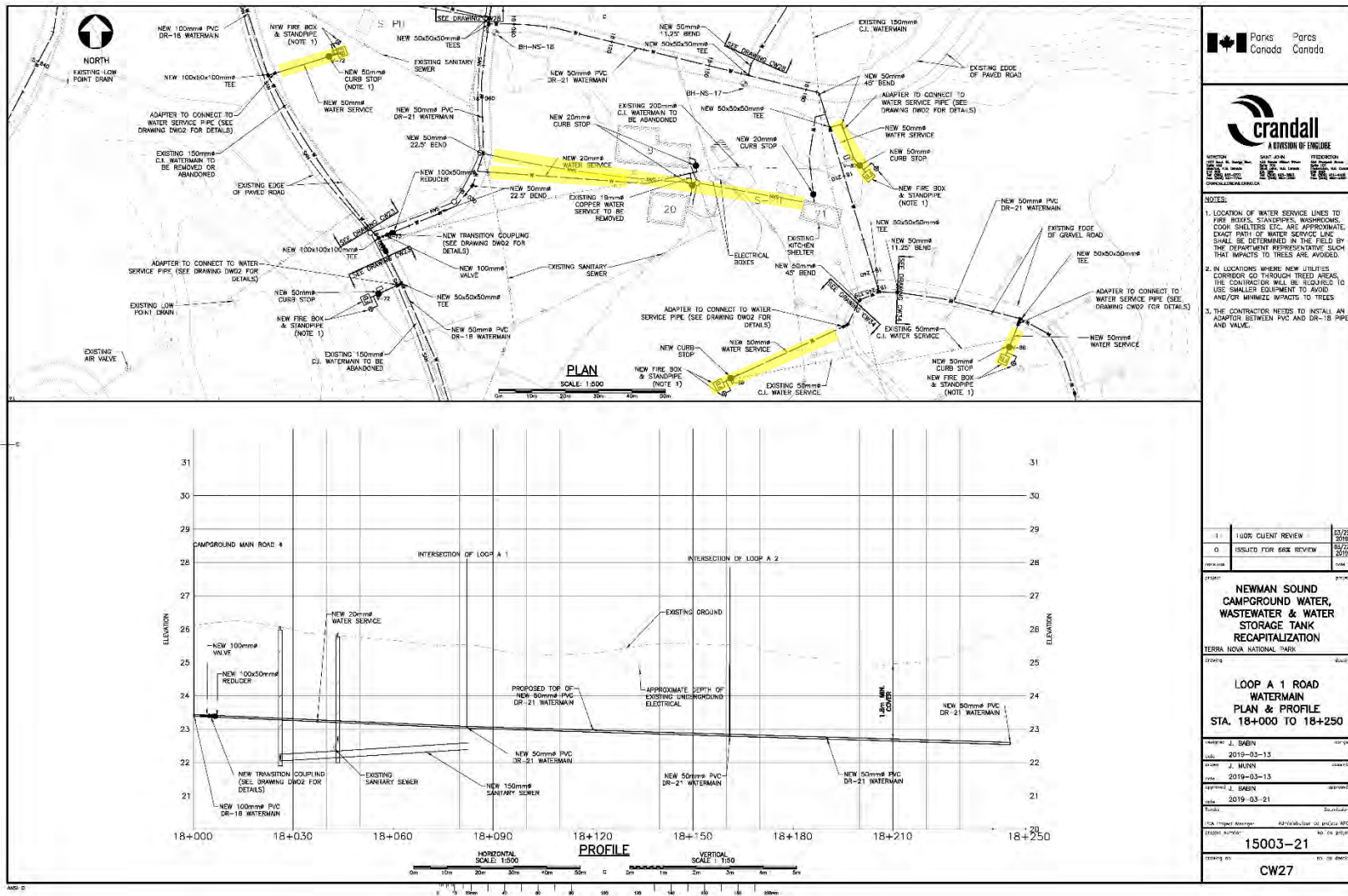


Figure 15: Loop A 1 Road Watermain. Yellow lines highlight proposed excavations in undisturbed locations of moderate archaeological potential. (Crandall 2019d: CW27).

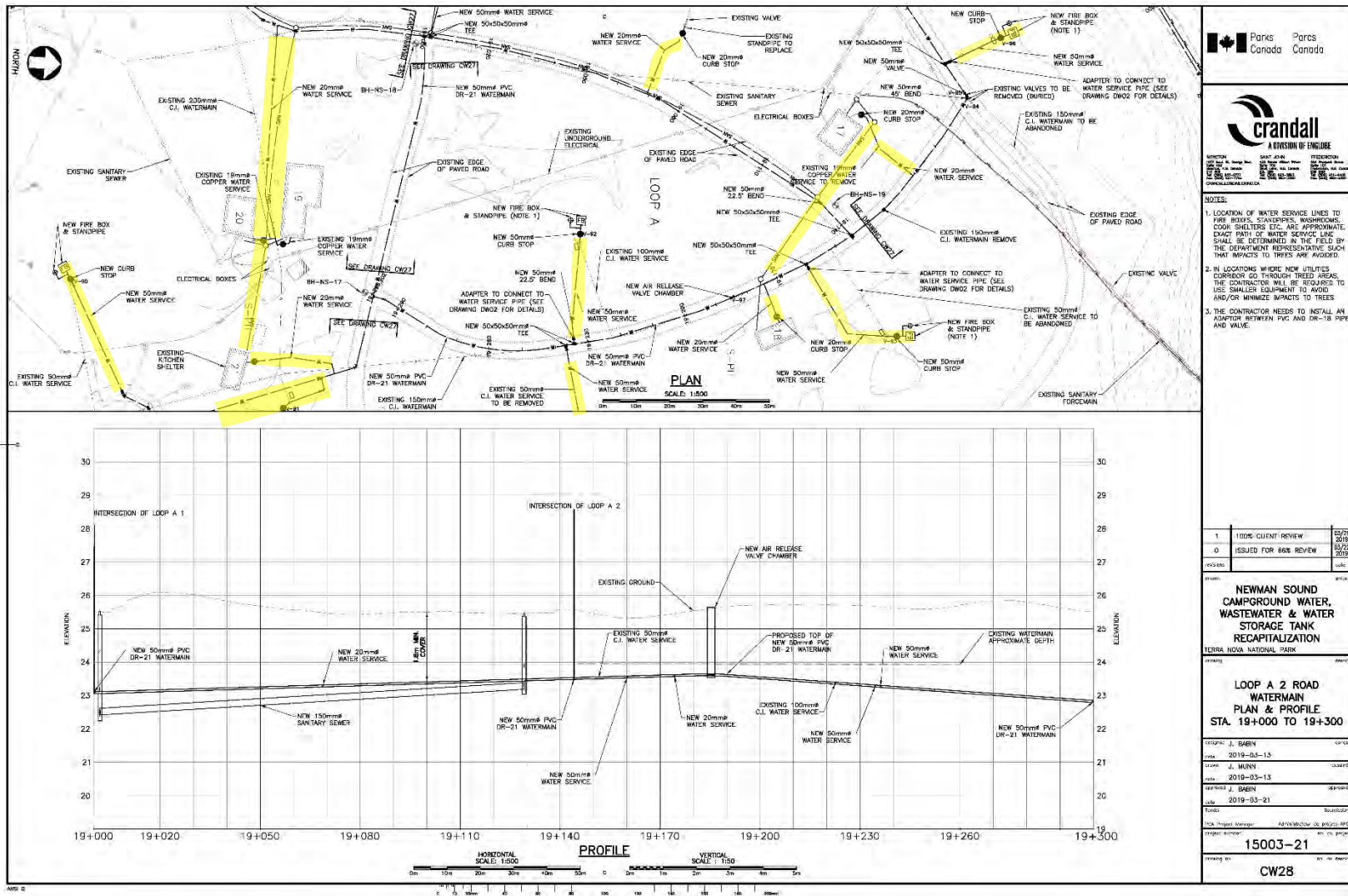


Figure 16: Loop A 2 Road Watermain. Yellow lines highlight proposed excavations in undisturbed locations of moderate archaeological potential. (Crandall 2019d: CW28).

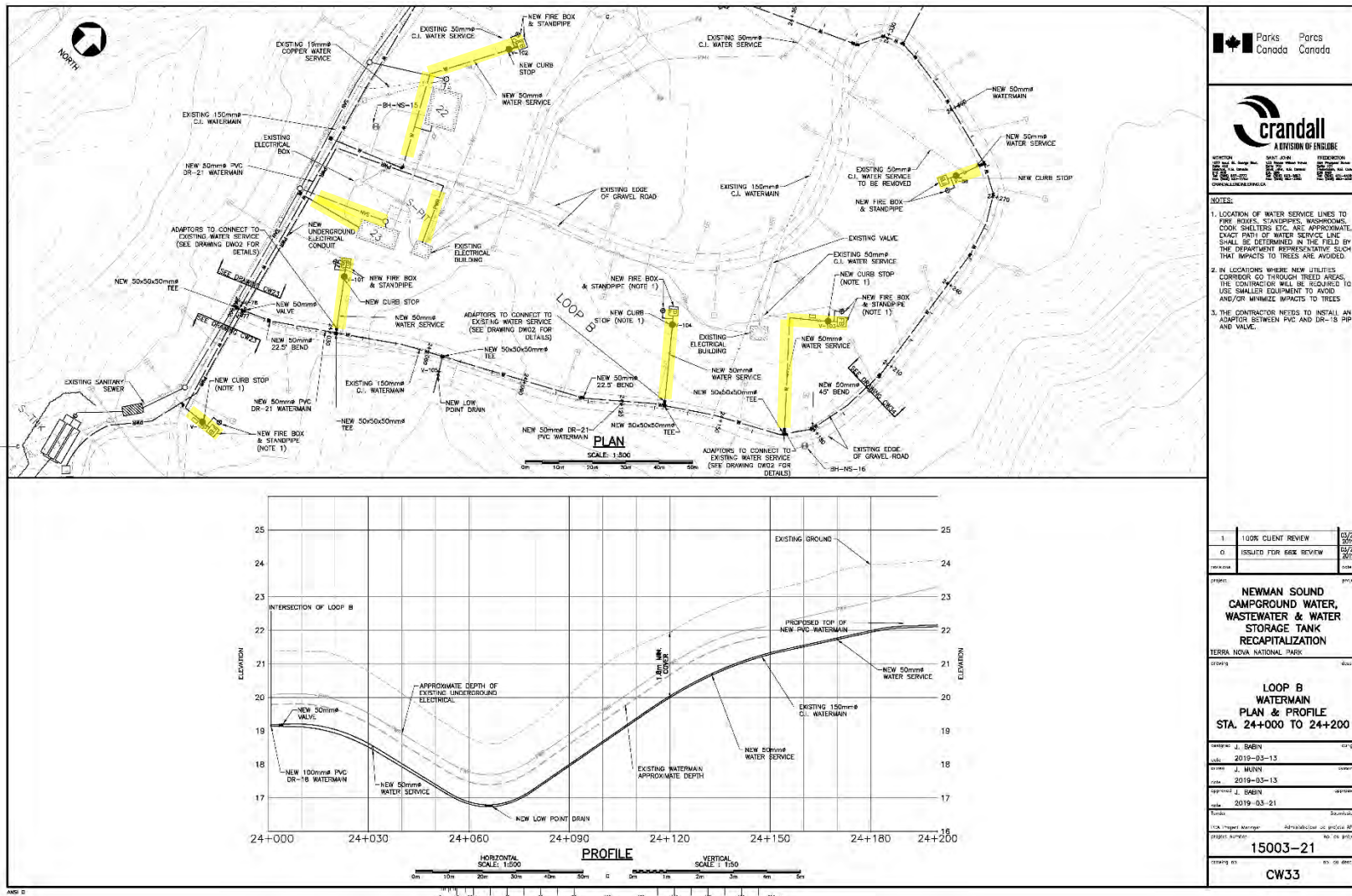


Figure 17: Loop B Watermain. Yellow lines highlight proposed excavations in undisturbed locations of moderate archaeological potential. (Crandall 2019d: CW33).



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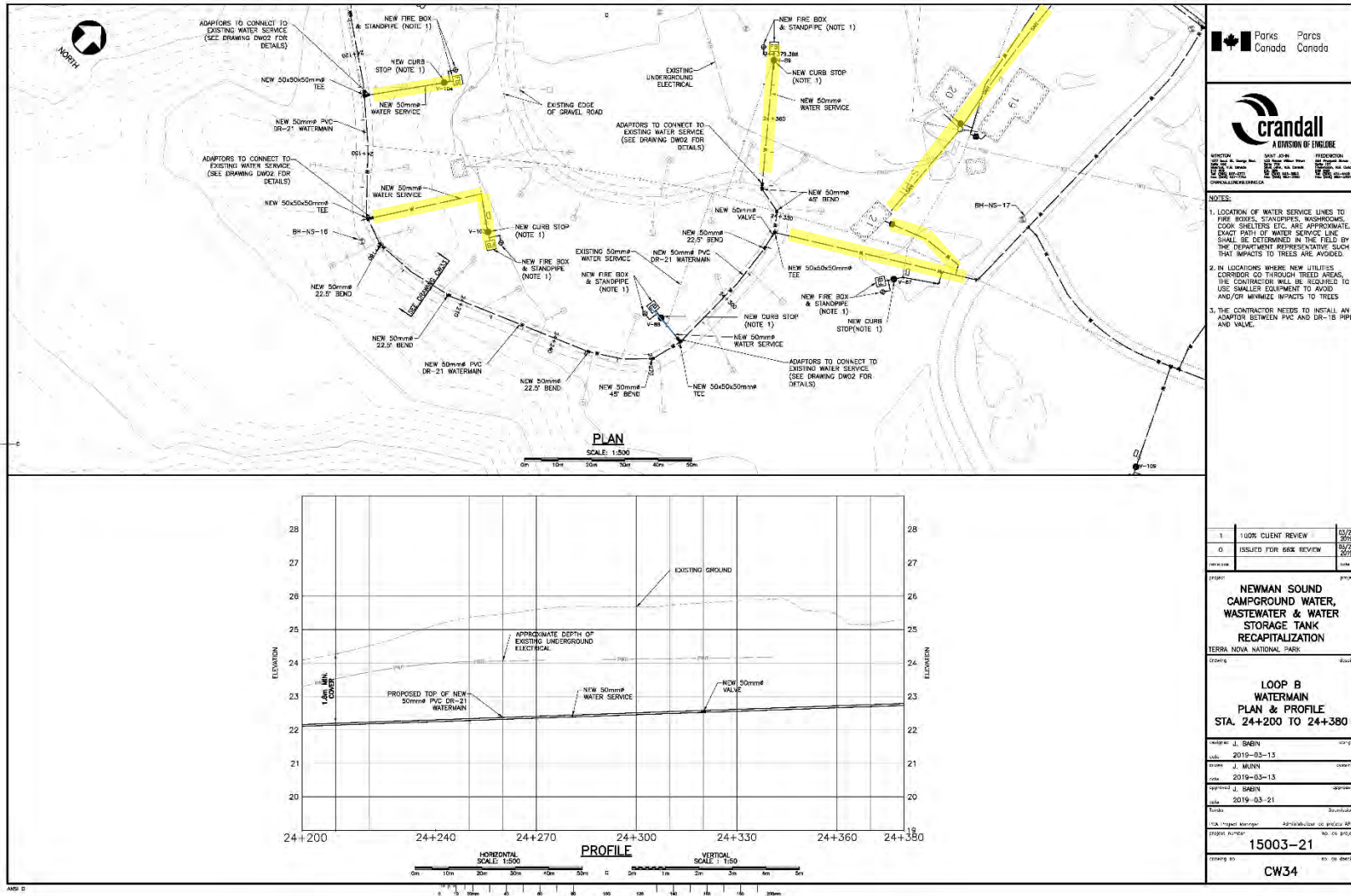


Figure 18: Loop B Watermain. Yellow lines highlight proposed excavations in undisturbed locations of moderate archaeological potential. (Crandall 2019d: CW34).



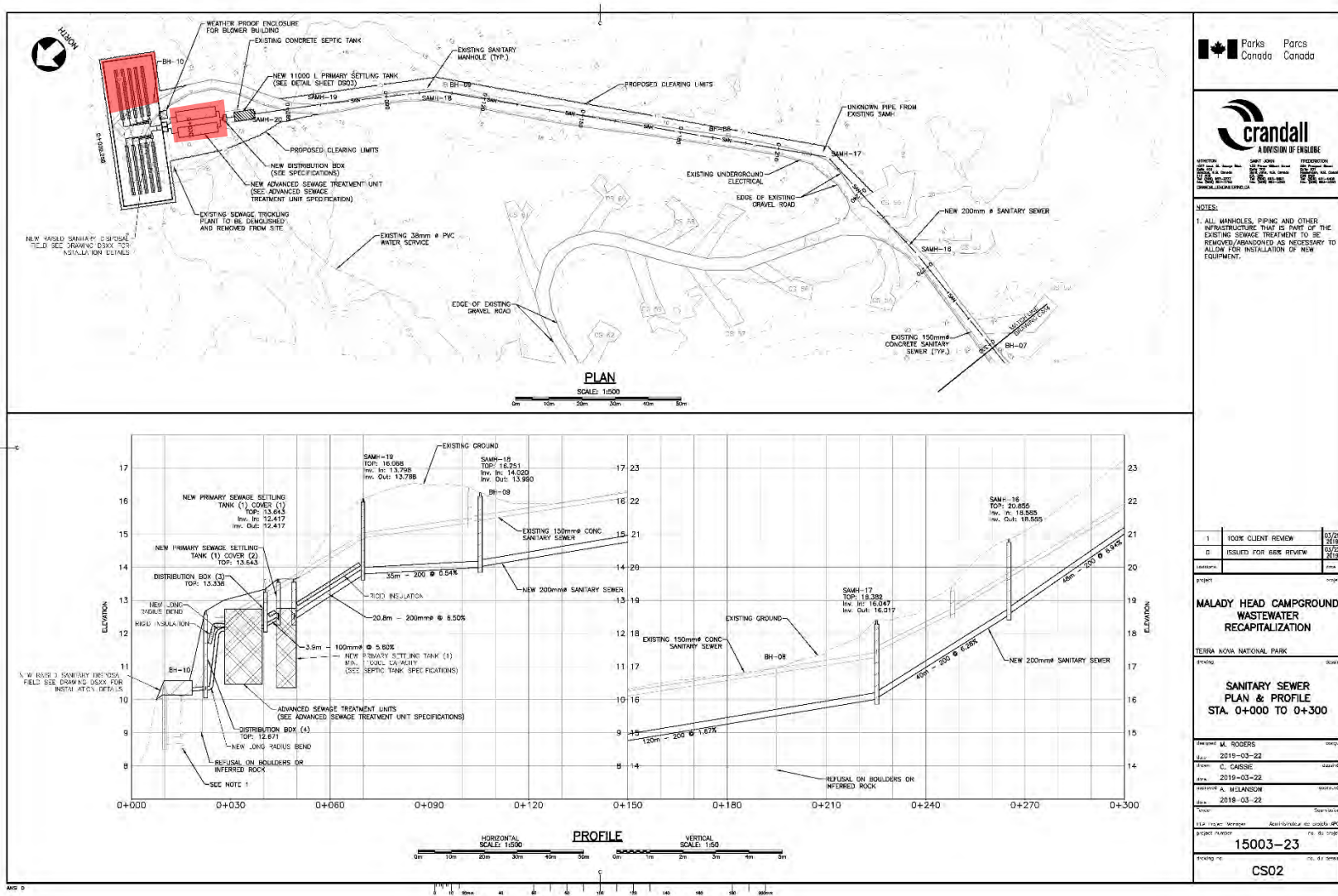


Figure 20: Sanitary Sewer Plan and Profile STA.0+000 to 0+300 with red rectangles showing project areas that may be located within previously undisturbed areas of the park (Crandall 2019a).



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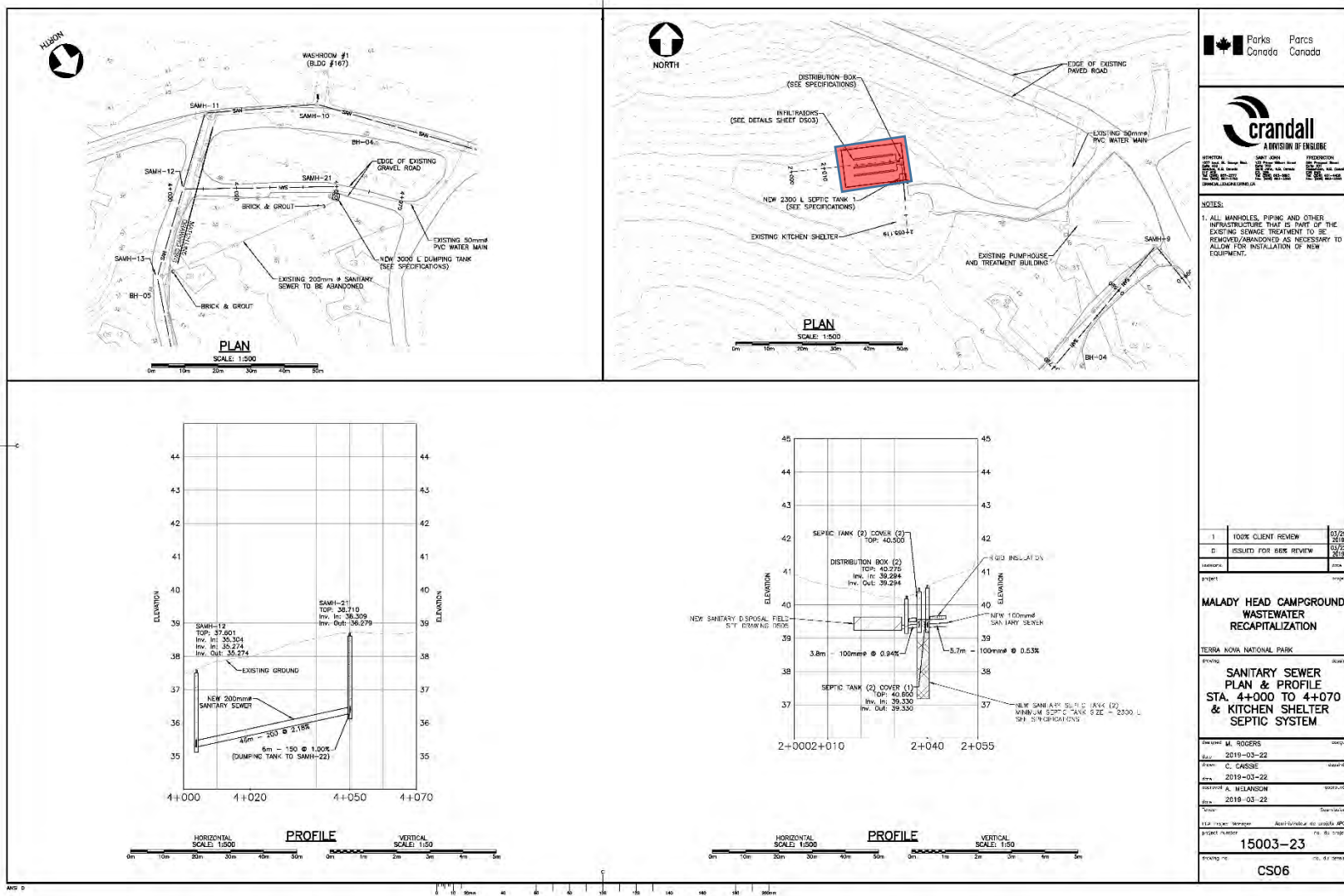


Figure 21: Sanitary Sewer Plan and Profile STA.4+000 to 4+070 & Kitchen Shelter Septic System. Red rectangles showing project areas that may be located within previously undisturbed areas of the park (Crandall 2019a).

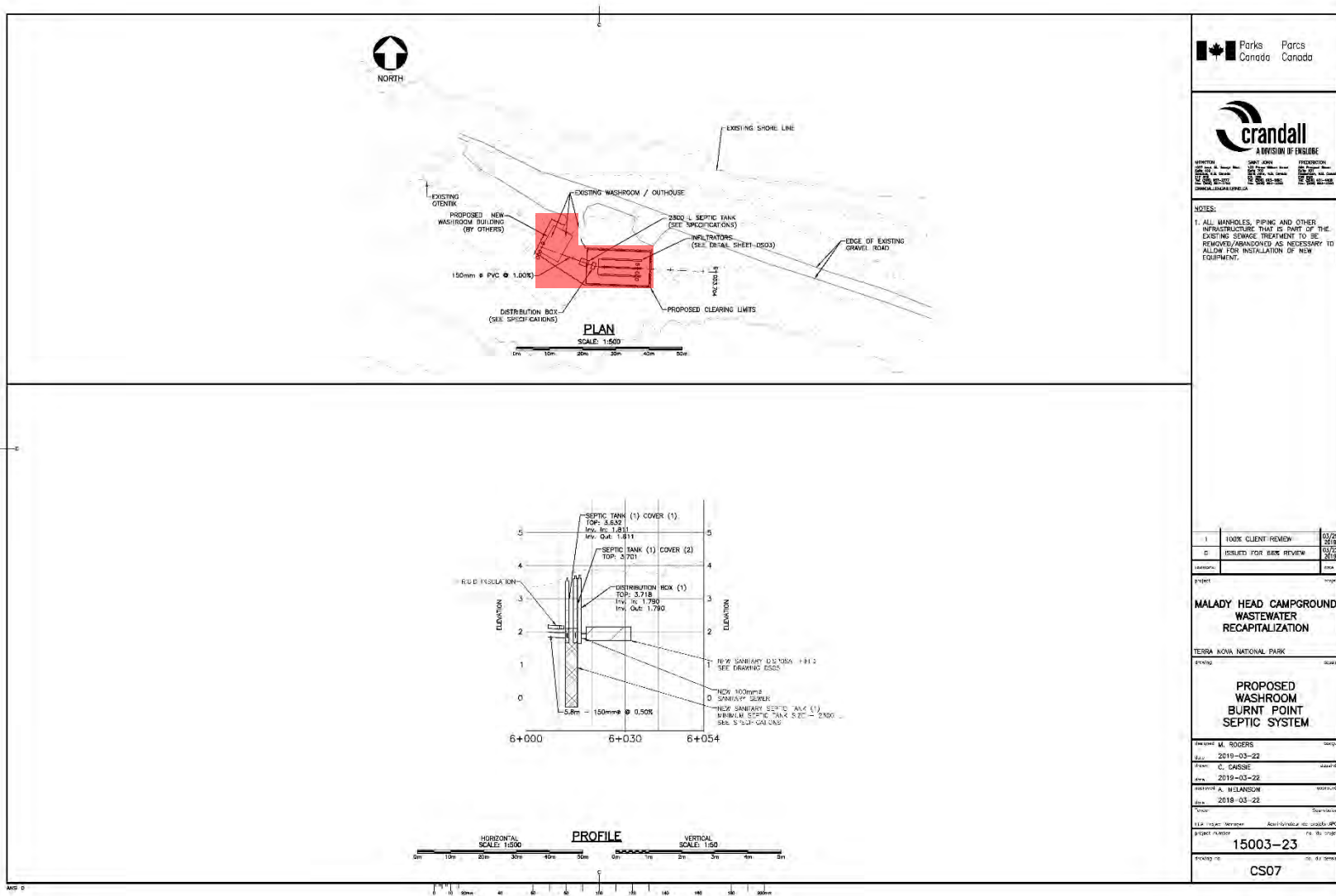


Figure 22: Proposed Washroom Burnt Point Septic System (Crandall 2019a)..