Hullcar Aquifer Contamination From a Water Purveyor Perspective

Experiences with Groundwater Licensing

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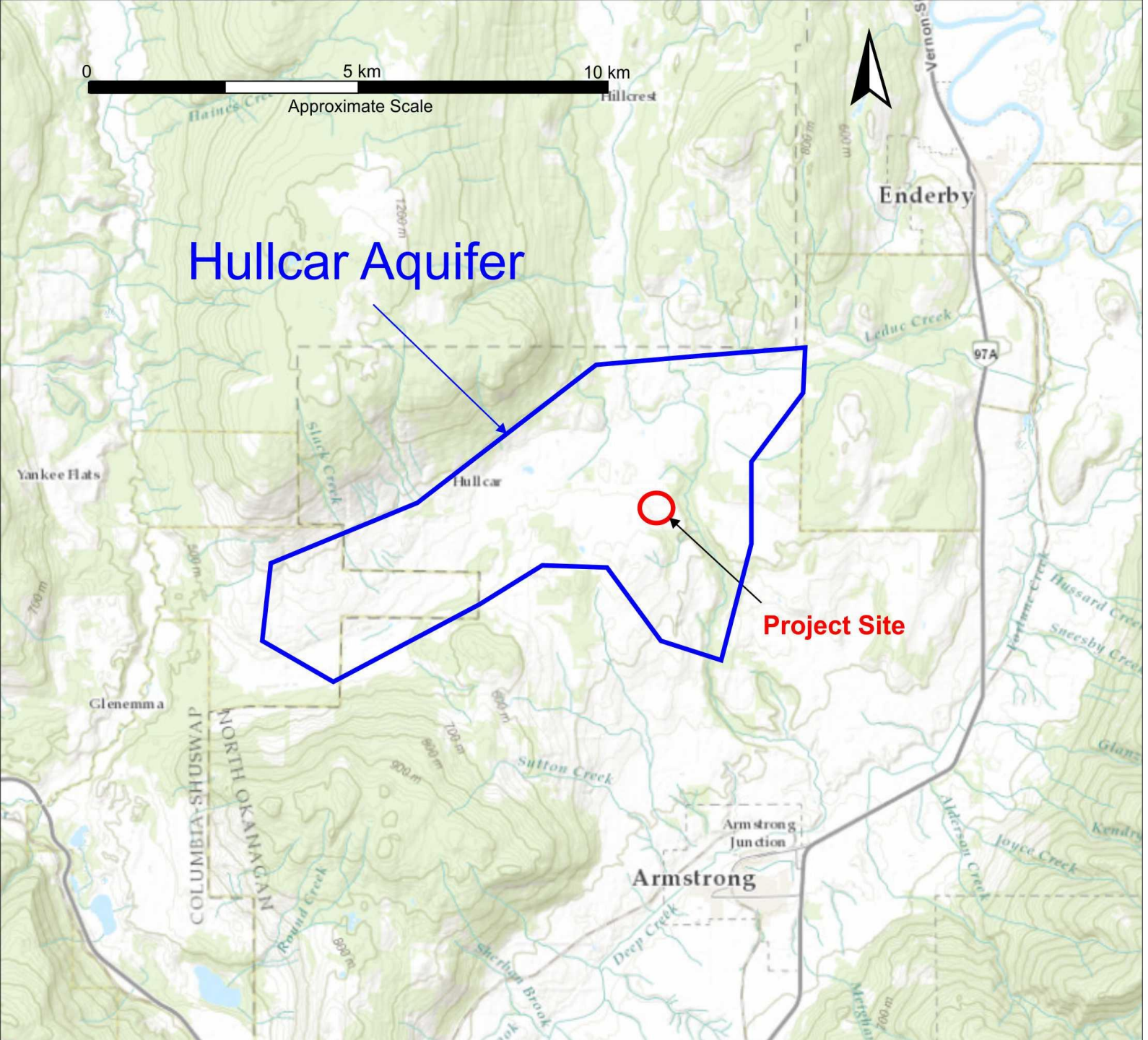
Consultants in Hydrogeology and Water Resources Management

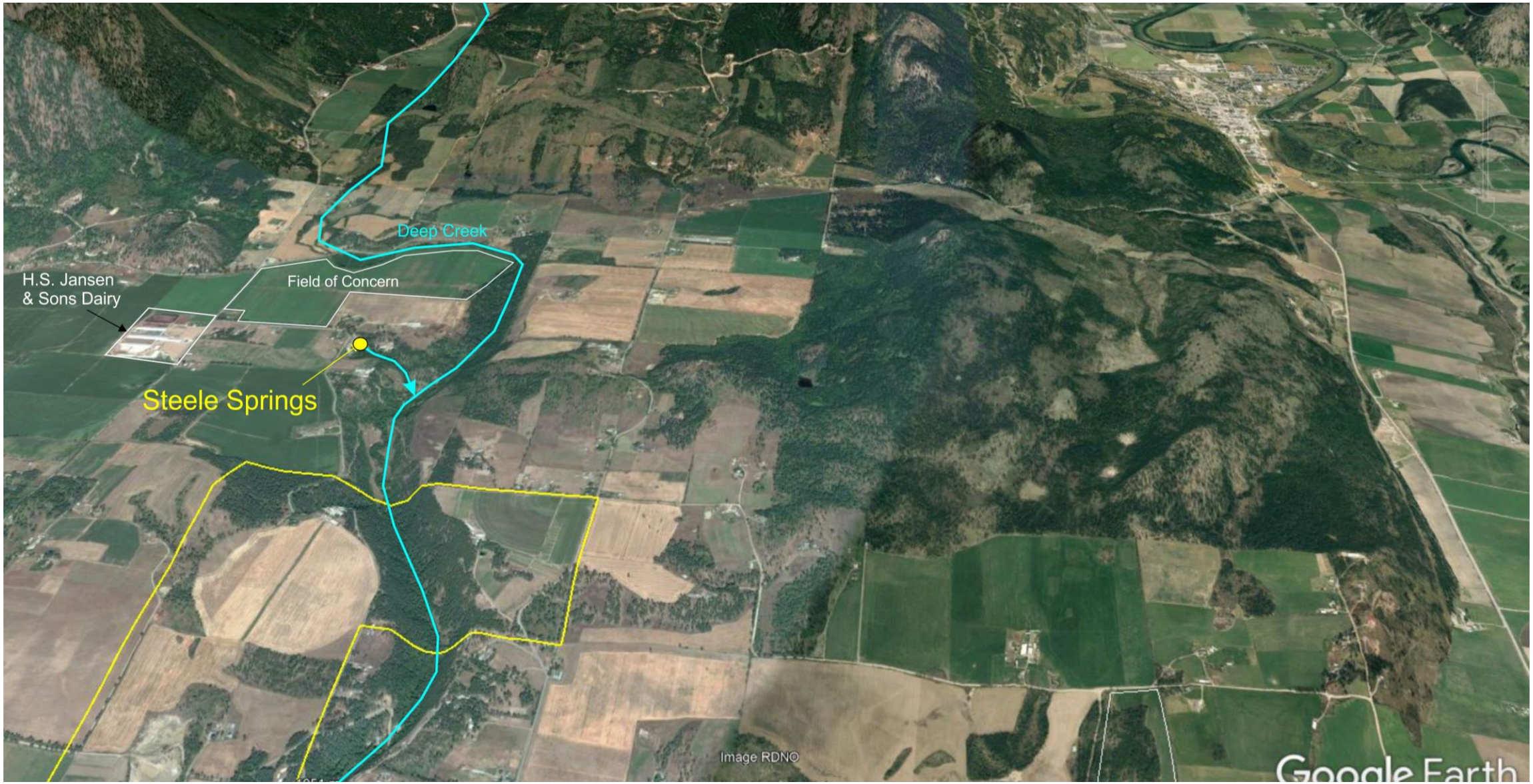


Steele Springs Waterworks District

- Established in 1924 as a water purveyor under the Water Act.
- 59 connections, supplies a population of ~200.
- Water demand on the order of 3.8 L/s (60 US gpm).
- Supplies rural residential properties of ~5-10 acres.

Water Source

- Source of water is Steele Springs. Water licenses on Springs date back to 1896.
- Springs emerge in a ravine, where they are immediately captured in building constructed over the spring.
- Chlorine injected near source. Distributed to connections on the way to reservoir.


Deep Creek
H.S. Jansen
& Sons Dairy
Field of Concern
Steele Springs
Image RDNO
Google Earth

So What Happened?

- In 2008, a large diary farm operation relocated from the Fraser Valley to Hullcar. ~670 cows beginning 2008.

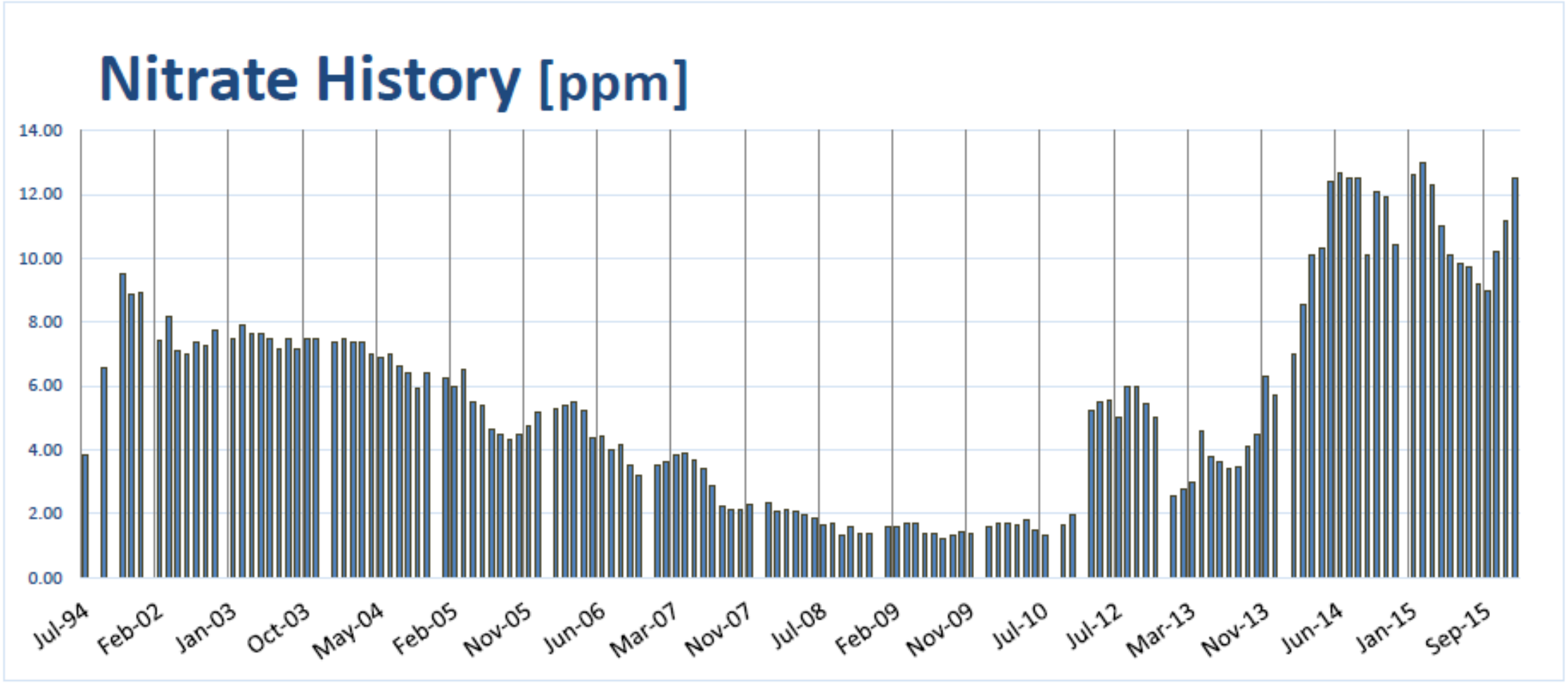
- Dairy operation includes main milking barns and infrastructure, as well as associated fields.

- Operation uses “flush barn” system. Generates a significant liquid and solid manure waste stream.

Image Source: Globe and Mail

Liquid Manure Application

- Effluent stored in lined ponds on site during fall through spring.
- Liquid manure applied to fields in the Hullcar area using tractor and ambilocal cord system.
- Solids separated, some applied to fields in the Hullcar area. At present, most or all solids transported out of the valley for application.


Nitrate History [ppm]
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Jul-94
Feb-02
Jan-03
Oct-03
May-04
Feb-05
Nov-05
Jun-06
Mar-07
Nov-07
Jul-08
Feb-09
Nov-09
Jul-10
Jul-12
Mar-13
Nov-13
Jun-14
Jan-15
Sep-15

Response Timeline

Image Source: Ryan Rhodes Photo

- In Feb/March 2014, Nitrate Concentrations in Steele Springs Reach 10 mg/L.
- March 2014: MoE issues compliance order to stop liquid effluent spreading
- March 2014: Interior Health puts SSWD on a Water Quality Advisory, which remains in place today.
- Following MoE Compliance Order, MoE continues to allow the farm to spread effluent at reduced rates in 2014 and 2015

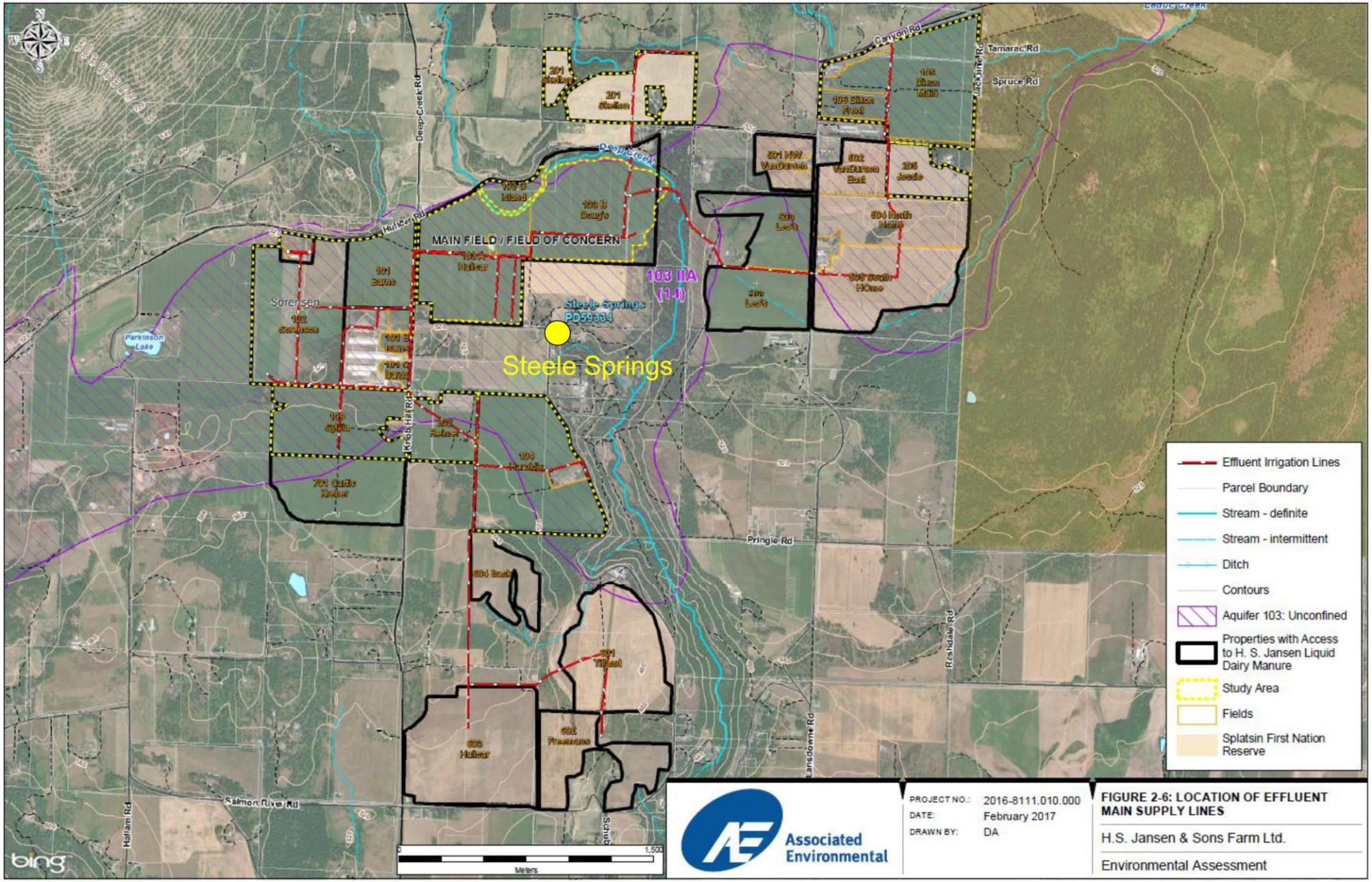
Response Timeline (Continued)

- 2014-2015: Local resident outrage with issue increases. Several Public Meetings in the area are held.

- March 2016: MoE issues a more serious Pollution Abatement Order. Orders Jansen and Sons Farms to complete an Environmental Assessment.
  - MOE also issues Pollution Abatement Orders to multiple other farm operations in the area.

- Separate Consultants retained by the Farm and the MoE to complete studies and assessments. Both find that the source of nitrate in the spring is from manure, and that over-application on the field of concern is the source of contamination.

- Since 2014, the farm has purchased more land or entered into agreements with other land owners to increase the area on which liquid effluent is applied.


MAIN FIELD / FIELD OF CONCERN
103 IIA
(14)
Steele Springs
PD59334
Steele Springs
Parkinson Lake
Deep Creek Rd
Hulbert Rd
Kobb Hill Rd
Pringle Rd
Salmon River Rd
Hallam Rd
Tamarac Rd
Spruce Rd
Carlyon Rd
Jackpine Rd
Rosedale Rd
Lansdowne Rd
Effluent Irrigation Lines
Parcel Boundary
Stream - definite
Stream - intermittent
Ditch
Contours
Aquifer 103: Unconfined
Properties with Access to H. S. Jansen Liquid Dairy Manure
Study Area
Fields
Splatsin First Nation Reserve
Associated Environmental
PROJECT NO.: 2016-8111.010.000
DATE: February 2017
DRAWN BY: DA
FIGURE 2-6: LOCATION OF EFFLUENT MAIN SUPPLY LINES
H.S. Jansen & Sons Farm Ltd.
Environmental Assessment

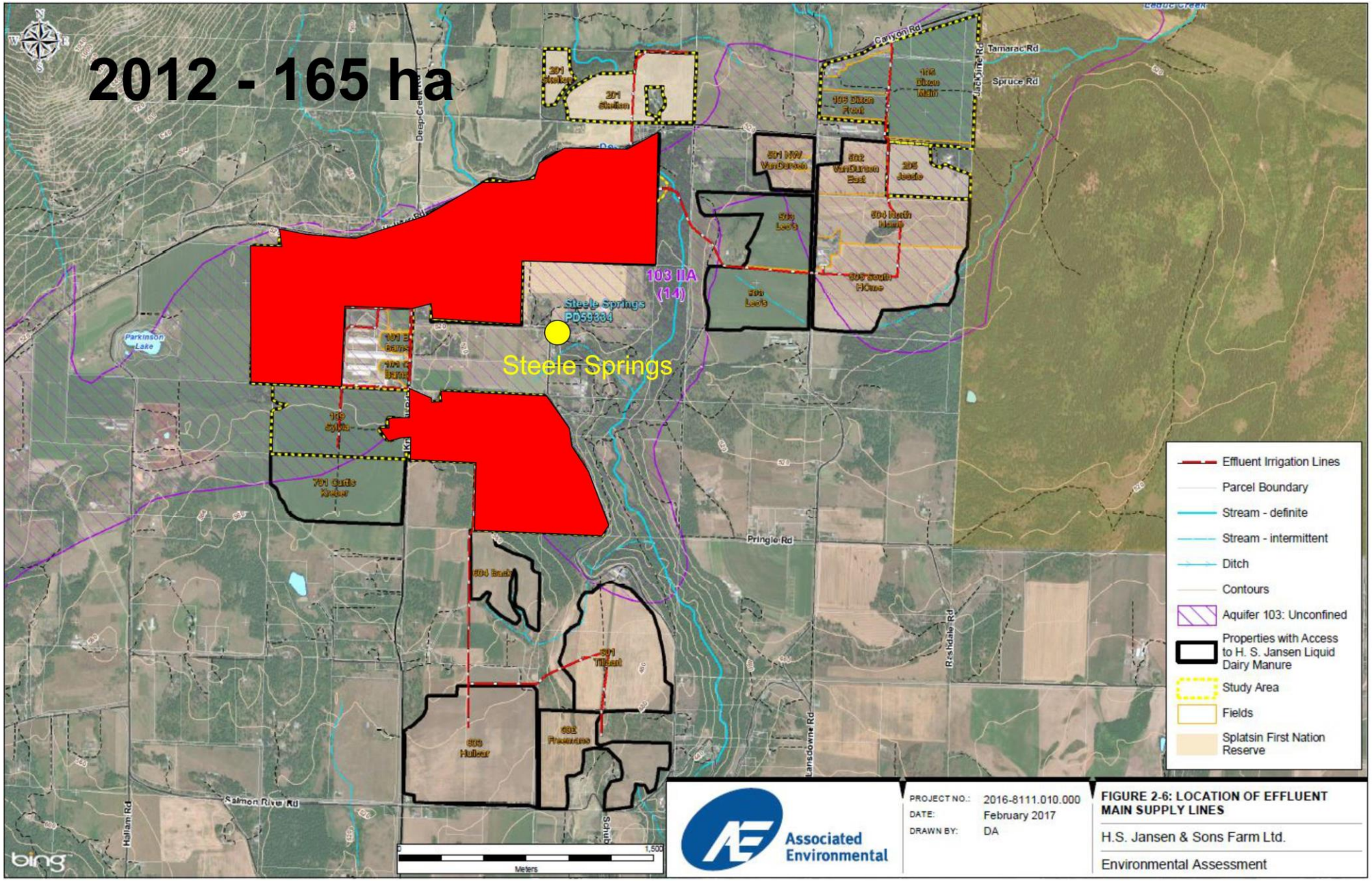

2012 - 165 ha
103 IIA (14)
Steele Springs
Steele Springs PD59334
Parkinson Lake
Pringle Rd
Salmon River Rd
Hallam Rd
Lansdowne Rd
Rosedale Rd
Tamarac Rd
Spruce Rd
Effluent Irrigation Lines
Parcel Boundary
Stream - definite
Stream - intermittent
Ditch
Contours
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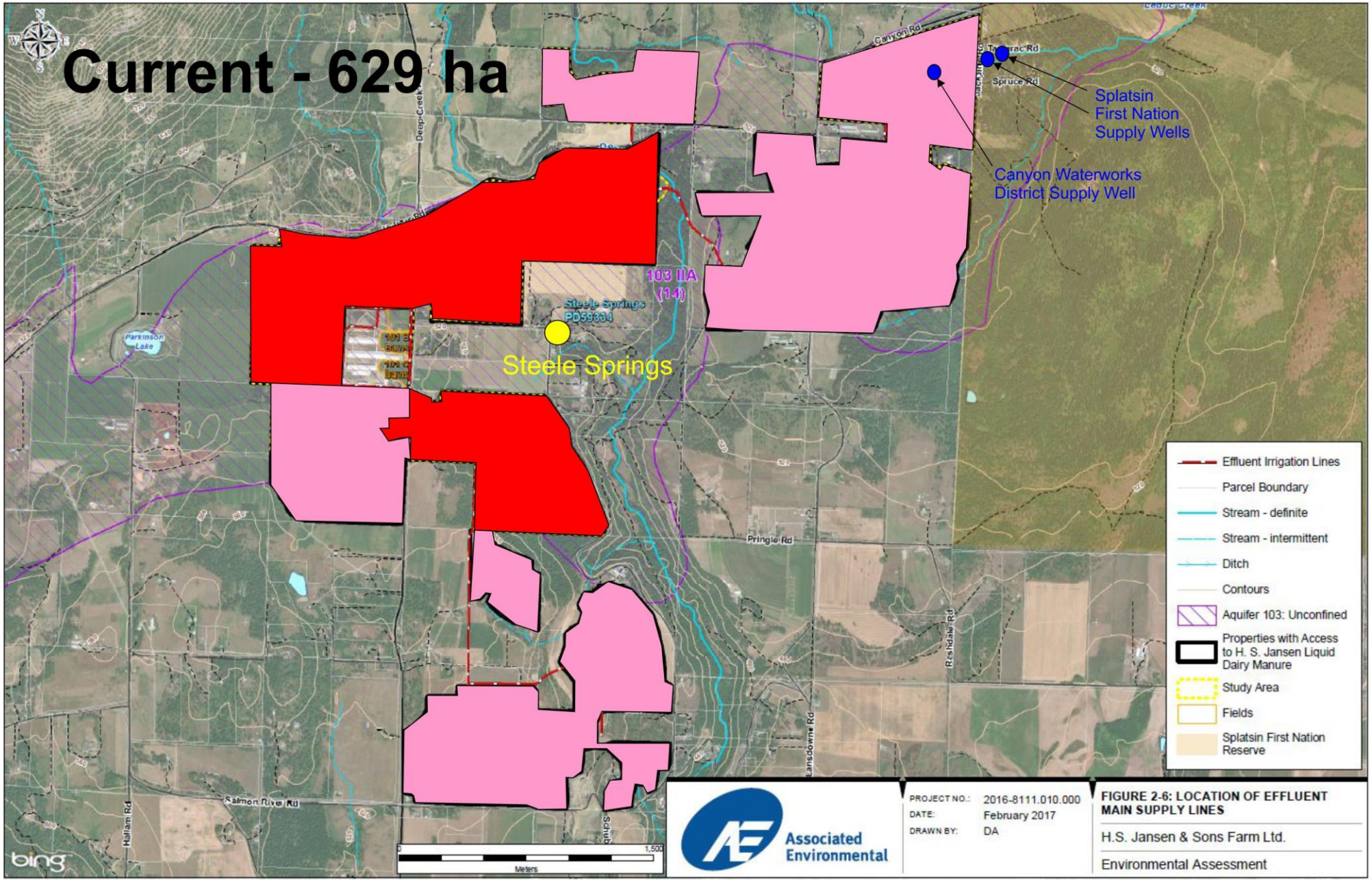
FIGURE 2-6: LOCATION OF EFFLUENT MAIN SUPPLY LINES
H.S. Jansen & Sons Farm Ltd.
Environmental Assessment
bing
Meters


Current - 629 ha
Splatsin First Nation Supply Wells
Canyon Waterworks District Supply Well
103 IIA (14)
Steele Springs
Steele Springs PD59334
Parkinson Lake
Deep Creek
Canyon Rd
Spruce Rd
Pringle Rd
Salmon River Rd
Hallam Rd
Lansdowne Rd
Rosedale Rd
Effluent Irrigation Lines
Parcel Boundary
Stream - definite
Stream - intermittent
Ditch
Contours
Aquifer 103: Unconfined
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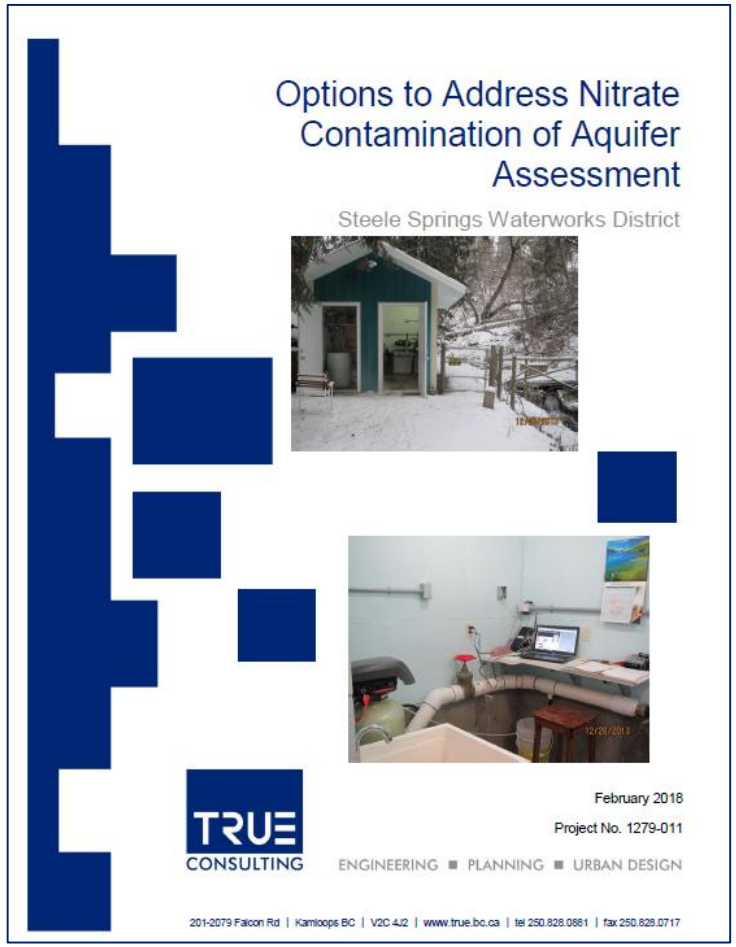
H.S. Jansen & Sons Farm Ltd.
Environmental Assessment
bing
Meters

Where are things At Now? (2018)

- Farm Continues to apply liquid manure to fields in the Hullcar, at what is considered "Appropriate Rates".
  - **This approach does not hold the protection of drinking water paramount.**
- Steele Springs still contaminated. Nitrate values still in the 10-14 mg/L range seasonally.
- In 2017, provincial government provides $950,000 of funding to address issues in Hullcar.
  - Steele Springs = $300,000
- The remaining money allocated to Splatsin First Nation and the farms that caused the problem.

Where are things At Now? (2018)



- 2017: SSWD commissions well feasibility study and engineering study for alternate water source ($40K)
- Several options considered: Treatment for nitrate, Connect to another water purveyor, drill a well.
- Engineering cost estimates for a basic municipal level alternate source range from $400K to $1.6M. New Well source is the least expensive option.

Where are things At Now? (2018)

- In spring 2018, a new well was drilled.
- Test pumped at 125 US gpm. Excellent well, could do 300+ gpm. No Nitrate.
- New use groundwater license application submitted July 5, 2018. Still Waiting…..
- SSWD proceeding with equipping well, pump building, connections etc. Not going to be to basic municipal quality to due funding constraints.

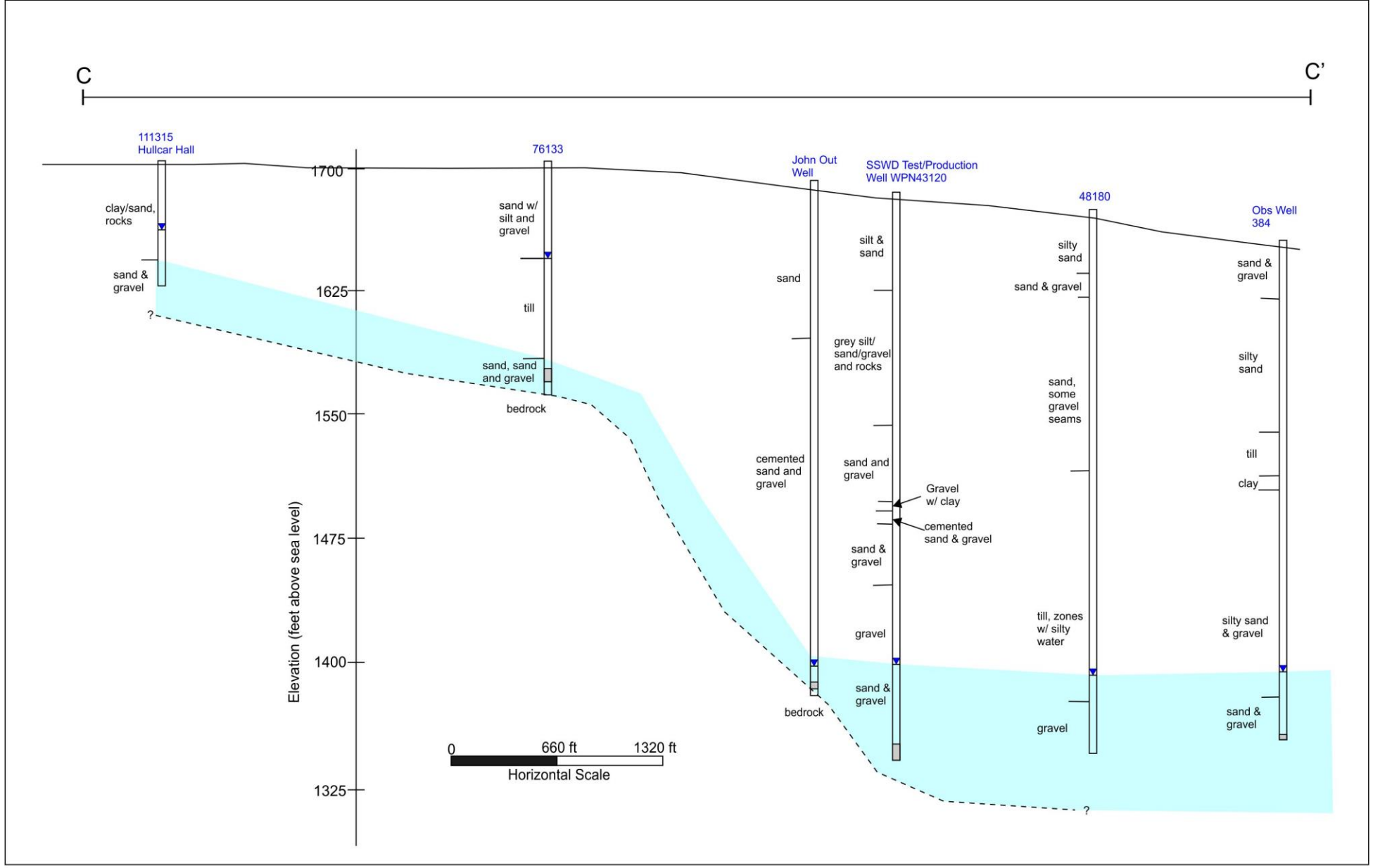


Figure 6 - Conceptual Cross-section C - C'

Land Surface Elevation obtained from Google Earth Pro elevation profile.Wells Labelled with Well Tag # unless otherwise noted.

Date: June 2018	Cross-Section Trace from Figure 2	WWAL Project: 15-046-04
Drawn by: RR	Checked by: DG	Client: Steele Springs Waterworks District

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Take Away for Water Purveyors

- When the SSWD saw nitrate levels increasing, they did several things:
  - Notified Interior Health
  - Notified MOE and MFLNRO
  - Engaged to the University of Victoria Environmental Law Center to prepare a submission to Interior Health requesting a hazard abatement order (Feb 2016)
  - Contacted MLA, Township of Spallumcheen, City of Armstrong, BC Groundwater Association, all of whom provided letters of support to have the issue addressed quickly.
  - Had a consultant to help identify the source of the contamination.

- **Four years later, Steele Springs still contaminated and is still source for the water system**

Take Away for Water Purveyors

- Township of Spallumcheen motto is “Farming Comes First”. While they are publicly concerned about the issue, they didn’t do much about it. Approved expansion to the farm in 2016.

- Interior Health in particular had a poor response.
  - Did not take advantage of the array of powers available to them to stop the contamination.
  - Drinking Water Protection Act does not require proof before actions can be taken.

Take Away for Water Purveyors

- Like many small rural water purveyors, the SSWD run by volunteers or near so. The time and effort spent by them was far above what is normally expected.

What is their advice to other water purveyors:

- Pay attention to land use changes. If there is a referral process get on that list.
- Have a baseline for water quality. Test more often than required.
- Be more aggressive. SSWD did not retain a lawyer and still hasn't, but in hindsight they might have.

GROUNDWATER LICENSING

Experience with the process this far.

Groundwater Licensing

- There are two licensing streams: Existing-Use and New-Use.
- **Existing-Use** allows water user to continue to use water as normal until their application is reviewed and approved.
    - Key date related to this quickly approaching (Feb 28, 2019). After this, Existing-Use Applications will be treated as new uses.
- **New-Use**: not lawfully allowed to use the water until you get your license.

New-Use Licensing

- New-Use applications the major hurdle.
- As a company, we have done about 60 license applications (both types).
- To date, we have received about 8 licenses, and had one rejected.
- Ministry states an internal processing target timeline of 140 days.
    - In our experience, this has been met once, for a carwash here in Prince George.
- Most New-Use applications take more than a year. Some approaching 2 years now.

BCGWA Actions

- We need to advocate for faster processing of applications.
- As important as turn-around time is consistency and dependability.
- 6 months seems reasonable. Even 9 months. But we need to be able to accurately advise our clients to help them plan projects.
- The Ministry is aware of our concerns and have reached out to me.
- BCGWA should prepare a position paper on licensing.

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THANK YOU