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# NUTRIENT MANAGEMENT PLAN

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## LEEKY TRACTOR FARM

Norma and Abigail Laedie

4147 Riverside Road

Duncan, BC, V9L6N1

Prepared for the 2024 season, dated March 15, 2024

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## EMERGENCY PROCEDURES & CONTACT INFORMATION

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In the event of a spill, the following actions should be taken:

1. Stop the source of the spill/leak
  - Stop and turn off all pumps, valves, and siphons from the structure
  - Move liquid fertilizer into another structure if necessary
  - Plug or close the source of the spill/leak if possible
2. Contain the spill/leak
  - Prevent the movement of liquid fertilizer across the soil surface by constructing an earthen berm using agricultural equipment, such as backhoes or front-end loaders on tractors
  - Try to prevent entry into water bodies, ditches, or seasonally-high water tables
  - Plug drainage intakes and tile drain outlets
  - Contact any contractors and/or equipment operators that may assist in containing the spill/leak (see the contact table below)
3. Report the spill/leak to the Provincial Emergency Program (PEP)/Emergency Management British Columbia (EMBC)
  - If spill/leak is greater than:
    - 50 kg of granular fertilizer
    - 50 L of liquid fertilizer
    - 200 kg of solid manure
  - Be prepared to provide:
    - The contact information for:
      - The individual making the report
      - The responsible person in relation to the spill
      - The owner of the substance spilled
    - The date and time of the spill
    - The location of the spill site
    - A description of the spill site and the surrounding area
    - A description of the source of the spill
    - The type and quantity of the substance spilled
    - A description of the circumstances, cause, and adverse effects of the spill
    - Details of any actions taken and planned to contain the spill/leak
4. Clean up the spill/leak
  - If possible, pump the contained liquids into a functional storage facility
  - Use absorbent materials to soak up the liquid fertilizer (e.g., sawdust mulch, sand, soil amendments)
  - Check tile drains and other drainage pipes/pathways for contamination (use a pump to clear out contaminated lines if necessary)
5. Review the [Spill Reporting Factsheet](#) and document the spill/leak and actions taken

Name	Type of contact	Phone number
Provincial Emergency Program (PEP)/Emergency Management British Columbia (EMBC)	Spill Reporting	1-800-663-3456
	Municipality contact	
	Fire Department	
	On-farm Equipment Operator	
	Excavation Contractor	
	Manure Hauler	
	Septic Tank Pumping Truck	
	Neighbour	
	Neighbour	
	Neighbour	

\*In the event of other emergencies, call 911 immediately.

## APPLICATION SCHEDULE SUMMARY

Field: West Back		Area: 12.3 ac	Crop: Potatoes-midseason
Nutrient Source	Application Timing	Method	Rate
Chicken-broiler manure (general)	Spring 2024	Broadcasted	3 yards <sup>2</sup> /ac
Muriate of potash (0-0-62)	May 2024	Banded	100 lb/ac
Urea (46-0-0)	May 2024	Banded	150 lb/ac

Field: West Front		Area: 8.3 ac	Crop: Beets
Nutrient Source	Application Timing	Method	Rate
Muriate of potash (0-0-62)	June 2024	Banded	50 lb/ac
8-18-22	June 2024	Banded	150 lb/ac

Field: Main Back		Area: 13.20 ac	Crop: Squash-zucchini, other
Nutrient Source	Application Timing	Method	Rate
Muriate of potash (0-0-62)	May 2024	Broadcasted	50 lb/ac
8-18-22	May 2024	Broadcasted	300 lb/ac
Urea (46-0-0)	June 2024	Side-dress	75 lb/ac

Field: Main Front		Area: 19.6 ac	Crop: Broccoli
Nutrient Source	Application Timing	Method	Rate
Chicken-broiler (general)	Spring 2024	Broadcast	4 yards <sup>2</sup> /ac
Muriate of potash (0-0-62)	April 2024	Broadcast	50 lb/ac
Urea (46-0-0)	June 2024	Side-dress	125 lb/ac

Field: East		Area: 25.1 ac	Crop: Peas
Nutrient Source	Application Timing	Method	Rate
Muriate of potash (0-0-62)	April 2024	Broadcast	100 lb/ac

## FARM DESCRIPTION

Leeky Tractor Farm is a mixed vegetable farm located at 4147 Riverside Rd, Duncan, BC. The farm is owned and operated as a general partnership by Norma and her wife Abigail. This farm was previously used as a dairy farm, but has been converted and operated as a vegetable farm for the last 7 years.

### LOCATION

As defined by the Agricultural Environmental Management Code of Practice (AEM CoP), the farm is located in the following high-risk areas:

#### VULNERABLE AQUIFER RECHARGE AREA:

Starting July 15, 2024, all horticulture operations  $\geq 5$  ha, will require a nutrient management plan if post-harvest nitrate soil tests are greater than or equal to 100 kg N/ha (89 lb N/ac) for any field.

#### PHOSPHORUS-AFFECTED AREA:

Starting July 15, 2024, all agricultural operations  $\geq 5$  ha, will require a nutrient management plan if soil test phosphorus levels are greater than or equal to 200 ppm (Kelowna extractant) for any field.

#### HIGH-PRECIPIATION AREA:

As the farm is located in a high-precipitation area, nutrient applications are prohibited during November, December, and January. Additionally, an application risk assessment must be completed prior to application in October, February, and March. Field stored manure piles must also be covered from October 1<sup>st</sup> through April 1<sup>st</sup>.

### FARMSTEAD AND CROP PRODUCTION AREAS

Farm Details	Total Acreage	Spreadable Acreage
Total Farm Size	149.8	-
Vegetables	80.2	78.5
<b>Total Crop Acreage</b>	<b>80.2</b>	<b>78.5</b>

Spreadable area is the total crop production area that can receive nutrient applications. Minimum setbacks for applying nutrient sources adjacent to watercourses is specified at 1.5 m for commercial fertilizer, or 3 m for other nutrient sources. The east field is observed to be bisected by a waterway, with restrictions on setbacks dependent on nutrient sources. Setback restrictions apply on the East field.

All drinking water sources were observed to be  $> 30$  m from the crop production area receiving nutrients. The location of these drinking water sources does not affect the spreadable area.

### FERTILIZER HANDLING & STORAGE

Granular fertilizer is stored in the shop, just south of the processing and cold storage building. The shop has a concrete floor and only stores roughly the fertilizer needed for the current season's application. An irrigation well is shown to be  $> 30$  m from the storage structure. The natural watercourse is a considerable distance from the storage site.

Granular fertilizers are loaded into the spreader at the shop, during the time of application. The proximity of the natural watercourse and drinking wells equate to a very low risk associated with groundwater or surface water contamination from spillage.

## **MANURE HANDLING & STORAGE**

All of the fields have received poultry manure (broiler-breeder) over the past two years. The poultry manure is delivered periodically over the winter from a neighboring poultry operation, and is stored east of the processing and cold storage buildings as temporary field storage, on a moderately well drained silty loam. Between October 1<sup>st</sup> and April 1<sup>st</sup>, the temporary field manure storage is covered with a tarp to reduce potential leaching and runoff.

## **NUTRIENT APPLICATION SUMMARY**

### **POTATO (MIDSEASON)**

Manure applications are broadcasted following ploughing, using a dual axel, 5 – 8 m<sup>3</sup> capacity, horizontal beating manure spreader. The manure is then incorporated within 1 – 2 days during the final discing. Since the variety Russet Norkotah requires more initial nutrients, a single application of granular fertilizer is banded at the time of planting, approximately 5 cm to the side and 5 cm below the seed piece.

### **BEETS**

Granular fertilizer is broadcasted using a 3-pt hitch fertilizer spreader, and disced in at the time of seeding.

### **SQUASH**

In the spring, prior to planting, granular fertilizer is broadcast using a 3-pt hitch fertilizer spreader and tilled into the seed beds. Side-dress the remaining urea nitrogen when the plants are 7 – 12 cm tall, or when plants begin to flower

### **BROCCOLI**

In the spring, prior to transplanting into the field, manure is broadcasted using a dual axel, 5 – 8 m<sup>3</sup> capacity, horizontal beating manure spreader. Additional granular fertilizers are broadcasted using a 3-pt hitch fertilizer spreader, and then are disced in along with the manure before planting. Around the time of last cultivation, a second application of granular fertilizer is side-dress in the field.

### **PEAS**

Little to no fertilizer is required. When deficiencies are present, granular applications are broadcasted and incorporated into the soil before planting.

## **CROP PRODUCTION & IRRIGATION SUMMARY**

### **MIDSEASON POTATO**



### West Back (Russet Norkotah) – 12.3 Acres

Approximately 1800 lb/ac of seed pieces are planted between mid to late May, at an average depth of 10 cm. The field is irrigated using a reel and irrigation boom. Commercial mechanical top-beaters are used to effectively beat off potato tops. Harvest is expected 80 – 100 days following planting, approximately mid-August to late September. A cover crop of fall rye is planted after harvest to reduce soil erosion over the winter.

## BEETROOT

### West Front (Red Ace) – 8.3 Acres

Approximately 6 lb/ac of seed sowed at 1.5 – 2.0 cm deep in rows 30 to 38 cm apart, will be planted in June, resulting in a plant population of 160 000/ac. The field is irrigated using a reel and irrigation boom. Harvest is expected in 60 – 80 days following planting, and is typically harvested between mid-September and the end of October.

## SQUASH

### Main Back (Dark Star) – 13.2 Acres

The summer squash is direct seeded between mid-May to mid-June. The seed is planted 2.5 – 4 cm deep, 45 – 90 cm apart, with spacing between rows 90 – 100 cm apart. Before planting the soil is disc and raised beds 12 – 20 cm high are created. During bloom, 8 colonies of bee are brought in to aid with pollination, although this field is also surrounded by extensive pollinator habitat. The field is irrigated using a reel and irrigation boom. The first harvests are typically 50 – 60 days following planting, and occur between mid-July and mid-September.

## BROCOLLI

### Main Front (Emerald City) – 19.6

The broccoli plants are started in a greenhouse, 4 – 7 weeks after seeding. They are transplanted in a high-density double row arrangement with rows spaced 30 cm apart, and pairs of rows on 60 – 70 cm centres. For a continuous harvest, a portion of the field is transplanted every 2 – 3 weeks from early spring until mid-July. The field is irrigated using a reel and irrigation boom. The first harvest typically occurs around late June, and continues through the summer and into the fall.

## PEAS

### East (Super Sugar Snap) – 25.1

The peas are planted into a plowed, harrowed and lightly culti-packed seed bed in early spring (late March through April). The seeds are drilled at a uniform depth of 4 to 5 cm, dropping 5 – 10 seeds per 50 cm of row, aiming for a plant population of 485 000/ac. The field does not have access to irrigation. The first harvests typically occur around early to mid-June, and continue through the summer.

## APPLICATION NOTES

Between the West and Main fields there is a waterway running Southwestward; however, headlands and access roads are present on either side of the top of the bank, spanning beyond the 1.5 – 3.0 m

setback distance. A more significant waterway is present bisecting the East field, with setback requirements dependent on nutrient source. Please refer to the following setback section for details regarding this waterway.

No drain tiles are present on this property.

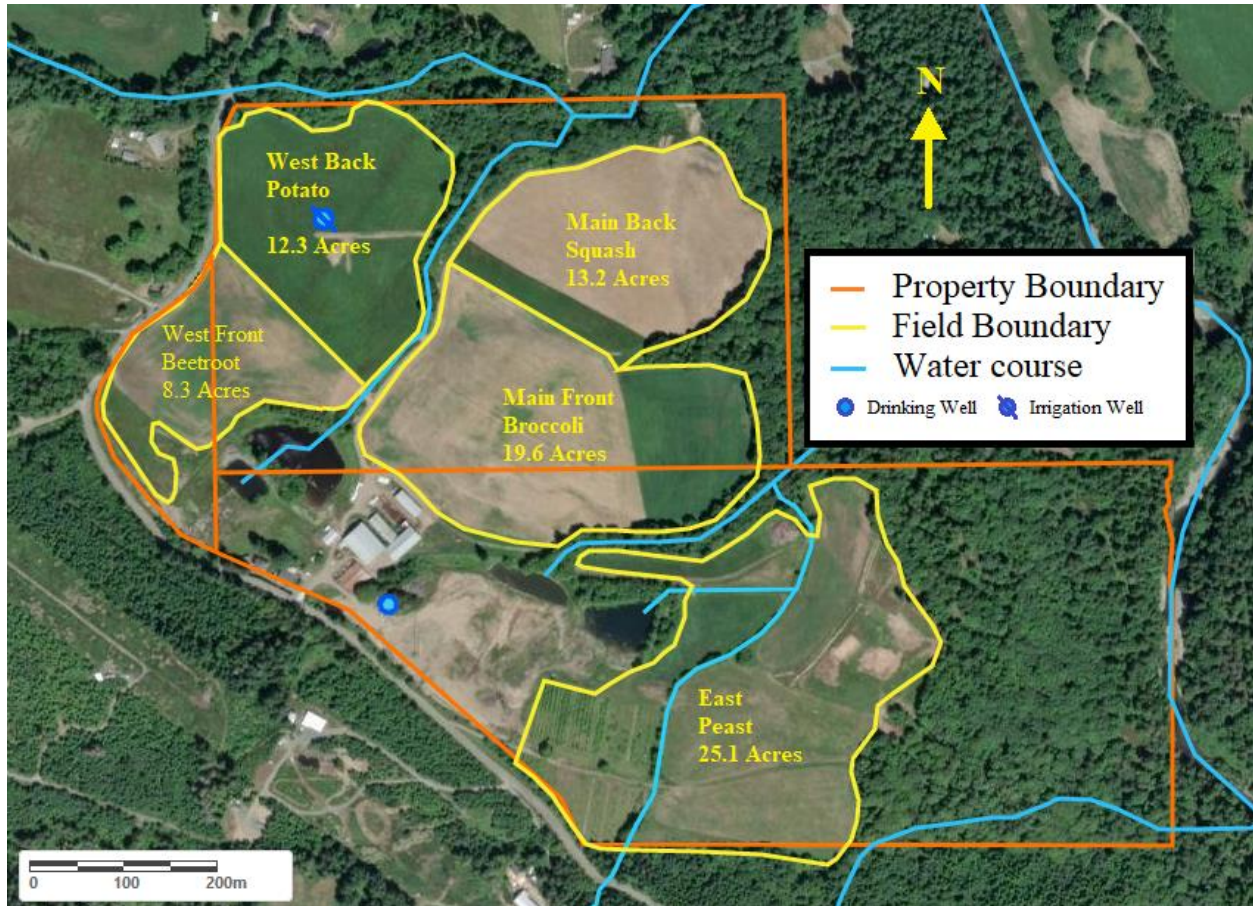
## **SETBACKS**

Minimum required setbacks from drinking water sources for commercial fertilizer and manure are 3.0 m and 30 m respectively. All observed drinking water wells are located > 30 m from any field, and will likely not affect setbacks.

Minimum required setbacks from natural streams for commercial fertilizer and manure are 1.5 m and 3.0 m respectively; Low slope, and well-drained soil types, provide a low-risk surface runoff. Increasing minimum setbacks between nutrient application and the waterway banks from 1.5 m is not required.

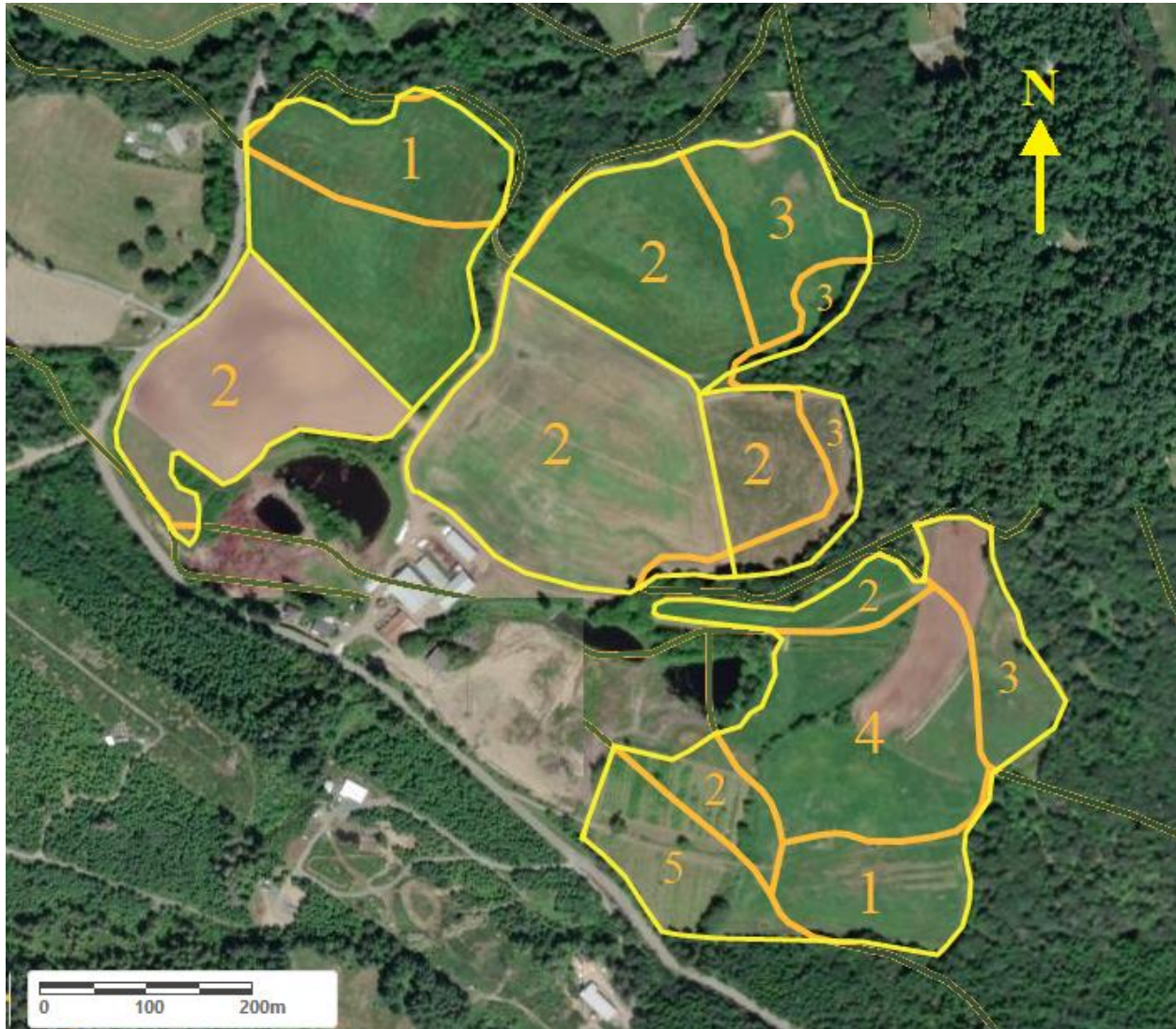
# FARM MAPS

## PROPERTY OVERVIEW MAP



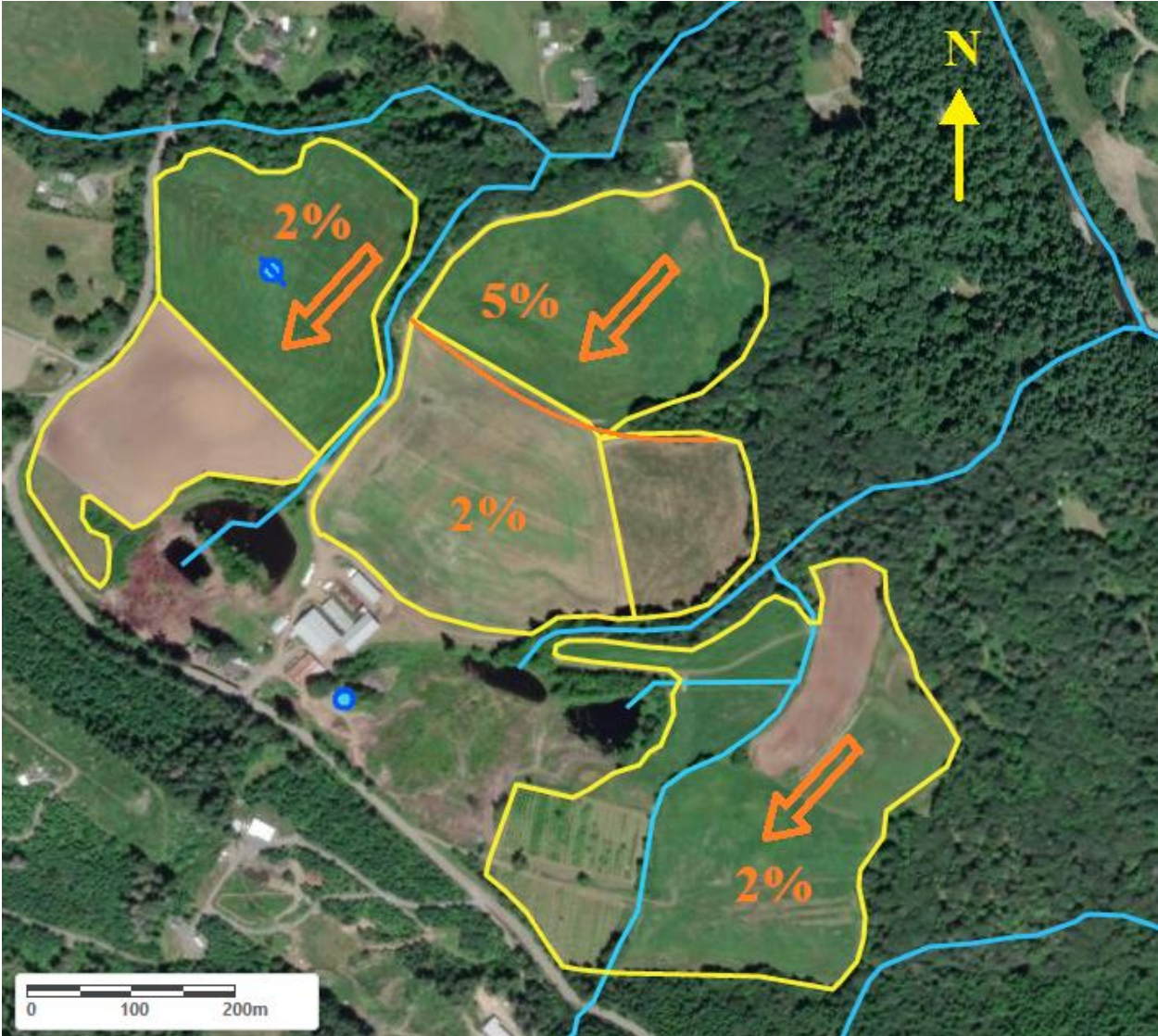
Field Name	Planned Crop(s) for 2024	Total Acreage	Spreadable Acreage
West Back	Potato – Midseason	12.3	12.3
West Front	Beetroot	8.3	8.3
Main Back	Squash	13.2	13.2
Main Front	Broccoli	19.6	19.6
East	Peas	26.8	25.1
		<b>80.2</b>	<b>78.5</b>

## SOIL CLASSIFICATION MAP



Soil ID	Soil Name	Soil Classification	Soil Texture	Drainage Class
1	FAIRBRIDGE	Gleyed Eluviated Dystric Brunisol	Silt Loam	Imperfectly Drained
2	HILLBANK	Orthic Dystric Brunisol	Silt Loam	Moderately Well Drained
3	QUALICUM	Orthic Dystric Brunisol	Sandy Loam	Rapidly Drained
4	COWICHAN	Humic Luvic Gleysol	Silty Clay Loam	Poorly Drained
5	SHAWNIGAN	Dyric Dystric Brunisol	Loam	Moderately Well Drained

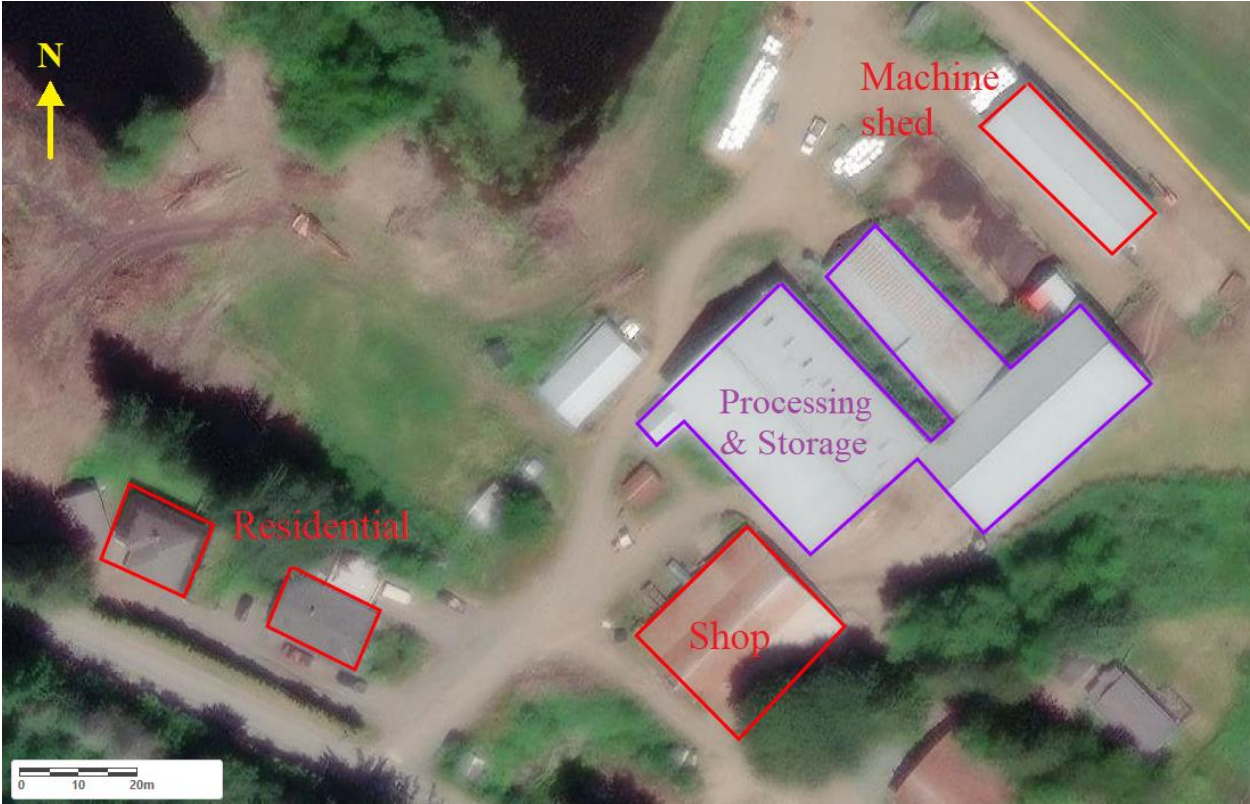
**SURFACE FEATURE MAP**



**DRINKING WATER WELLS SETBACK MAP**



**BUILDING MAP**



## NUTRIENT INVENTORY

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All solid manure and fertilizer are imported to the farm for use as nutrients. No nutrient sources are expected to be produced or exported during the time period described in this nutrient management plan. The following tables outline the total nutrient requirement, per product, for this farm enterprise over the 2024 growing season:

Material	Total Amount Required in 2024
Muriate of potash (0-0-62)	2628.57 kg
Urea (46-0-0)	2397.24 kg
8-18-22	2360.95 kg

Material	Material Source	Annual Amount	Land-applied	Amount Remaining
Chicken-broiler (general)	Leghorn Poultry Farm	56 tons	56 tons (100%)	None



## FIELD SUMMARIES

### WEST BACK (POTATO) – 12.3 ACRES

Crop	Yield	Previous crop ploughed down (N credit)
Potatoes-midseason	15.0 ton/ac	Non-legume cover crop (barley, radish, etc.)

Soil Test Results: September 2023		Soil test P & K Method: A & L Canada (Bray-1 and Mehlich 3)	
Nitrate-N: 19 ppm	Phosphorus: 81 ppm (High)	Potassium: 188 ppm (Med)	pH: 5.8
Field Comments:			

#### Nutrient Application Plan: 2024

Nutrient Source	Application Timing	Method	Rate
Chicken-broiler manure (general)	Spring 2024	Broadcasted	3 yards <sup>2</sup> /ac
Muriate of potash (0-0-62)	May 2024	Banded	100 lb/ac
Urea (46-0-0)	May 2024	Banded	150 lb/ac

	Agronomic Balance (lb/ac)			Crop Removal Balance (lb/ac)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Potatoes-midseason	-143	-36	-71	-110	-39	-164
Previous years' manure	45	0	0	0	0	0
Chicken-broiler manure (general)	32	39	37	46	56	37
Muriate of potash (0-0-62)	0	0	62	0	0	62
Urea (46-0-0)	69	0	0	69	0	0
<b>Balance</b>	<b>3</b>	<b>3</b>	<b>28</b>	<b>5</b>	<b>17</b>	<b>-65</b>

#### NOTES AND CONSIDERATIONS:

- Previous years poultry manure application will result in approximately 40 – 50 lb/ac of carry-over plant available nitrogen.
- Ploughing down and incorporating the previous year's fall rye cover crop likely provides no additional nitrogen credits.
- Following ploughing in spring, broadcast chicken manure and incorporate within 1 day.
- Russet Norkotah requires more initial fertilizer, therefore at the time of planting, band the urea and potash approximately 5 cm to the side and 5 cm below the seed piece.
- Crop requirement for potassium is met, 28 lb/ac adds no benefit to the crop.

## WEST FRONT (BEETROOT) – 8.3 ACRES

Crop	Yield	Previous crop ploughed down (N credit)
Beets	11.4 ton/ac	None (no N credit)

Soil Test Results: October 2023		Soil test P & K Method: A & L Canada (Bray-1 and Mehlich 3)	
Nitrate-N: 14 ppm	Phosphorus: 126 ppm (High)	Potassium: 210 ppm (Med)	pH: 6.2
Field Comments:			

### Nutrient Application Plan: 2024

Nutrient Source	Application Timing	Method	Rate
Muriate of potash (0-0-62)	June 2024	Banded	50 lb/ac
8-18-22	June 2024	Banded	150 lb/ac

	Agronomic Balance (lb/ac)			Crop Removal Balance (lb/ac)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Beets	-49	-22	-62	-133	-41	-100
Previous years' manure	45	0	0	0	0	0
Muriate of potash (0-0-62)	0	0	31	0	0	31
8-18-22	12	27	33	12	27	33
<b>Balance</b>	<b>8</b>	<b>5</b>	<b>2</b>	<b>-121</b>	<b>-14</b>	<b>-36</b>

### NOTES AND CONSIDERATIONS:

- Previous years poultry manure application will result in approximately 40 – 50 lb/ac of carry-over plant available nitrogen. It has also likely resulted in the buildup of soil phosphorus and potassium levels.
- At the time of seeding, disc in the potash and 8-18-22 granular fertilizer. No additional fertilizer applications should be needed.

## MAIN BACK (SQUASH) – 13.2 ACRES

Crop	Yield	Previous crop ploughed down (N credit)
Squash-zucchini, other	8.5 ton/ac	None (no N credit)

Soil Test Results: October 2023		Soil test P & K Method: A & L Canada (Bray-1 and Mehlich 3)	
Nitrate-N: 29 ppm	Phosphorus: 36 ppm (Med)	Potassium: 139 ppm (Med)	pH: 6.4
Field Comments:			

### Nutrient Application Plan: 2024

Nutrient Source	Application Timing	Method	Rate
Muriate of potash (0-0-62)	May 2024	Broadcasted	50 lb/ac
8-18-22	May 2024	Broadcasted	300 lb/ac
Urea (46-0-0)	June 2024	Side-dress	75 lb/ac

	Agronomic Balance (lb/ac)			Crop Removal Balance (lb/ac)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Squash	-98	-54	-89	-33	-12	-45
Previous years' manure	45	0	0	0	0	0
Muriate of potash (0-0-62)	0	0	31	0	0	31
8-18-22	24	54	66	24	54	66
Urea (46-0-0)	34	0	0	34	0	0
<b>Balance</b>	<b>5</b>	<b>0</b>	<b>8</b>	<b>25</b>	<b>42</b>	<b>52</b>

### NOTES AND CONSIDERATIONS:

- Previous years poultry manure application will result in approximately 40 – 50 lb/ac of carry-over plant available nitrogen.
- In the spring, prior to planting, broadcast and disc in the potash and 8-18-22 granular fertilizer.
- Side-dress the remaining urea nitrogen when the plants are 7 – 12 cm tall.
- Post-harvest nitrate levels were above the required threshold. There may be a greater carry over and mineralization of organic nitrogen in this field. If nitrogen levels remain high, planting a fall cover crop could help tie up the available nitrogen.

## MAIN FRONT (BROCCOLI) – 19.6 ACRES

Crop	Yield	Previous crop ploughed down (N credit)
Broccoli	5.5 ton/ac	None (no N credit)

Soil Test Results: October 2023		Soil test P & K Method: A & L Canada (Bray-1 and Mehlich 3)	
Nitrate-N: 12 ppm	Phosphorus: 50 ppm (Med)	Potassium: 191 ppm (Med)	pH: 6.5
Field Comments:			

### Nutrient Application Plan: 2024

Nutrient Source	Application Timing	Method	Rate
Chicken-broiler (general)	Spring 2024	Broadcast	4 yards <sup>2</sup> /ac
Muriate of potash (0-0-62)	April 2024	Broadcast	50 lb/ac
Urea (46-0-0)	June 2024	Side-dress	125 lb/ac

	Agronomic Balance (lb/ac)			Crop Removal Balance (lb/ac)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Broccoli	-116	-45	-71	-55	-14	-76
Previous years' manure	22	0	0	0	0	0
Chicken-broiler (general)	43	53	49	62	75	49
Muriate of potash (0-0-62)	0	0	31	0	0	31
Urea (46-0-0)	58	0	0	58	0	0
<b>Balance</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>65</b>	<b>61</b>	<b>4</b>

### NOTES AND CONSIDERATIONS:

- Previous years poultry manure application will result in approximately 20 – 30 lb/ac of carry-over plant available nitrogen.
- Prior to planting, broadcast and disc in potash and chicken manure.
- Around the time of last cultivation, side-dress the field with nitrogen (urea).
- Expect next years' manure nitrogen credit to increase due to subsequent years of manure application.

## EAST (PEAS) – 25.1 ACRES

Crop	Yield	Previous crop ploughed down (N credit)
Peas	2.6 ton/ac	None (no N credit)

Soil Test Results: October 2023		Soil test P & K Method: A & L Canada (Bray-1 and Mehlich 3)	
Nitrate-N: 6 ppm	Phosphorus: 154 ppm (Very High)	Potassium: 164 ppm (Med)	pH: 6.5
Field Comments:			

### Nutrient Application Plan: 2024

Nutrient Source	Application Timing	Method	Rate
Muriate of potash (0-0-62)	April 2024	Broadcast	100 lb/ac

	Agronomic Balance (lb/ac)			Crop Removal Balance (lb/ac)		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Peas	0	0	-54	-49	-13	-16
Muriate of potash (0-0-62)	0	0	62	0	0	62
<b>Balance</b>	0	0	8	-49	-13	46

### NOTES AND CONSIDERATIONS:

- Phosphorus levels are high, and are beyond crop requirements. Limit phosphorus inputs and mine the accumulated soil reserves
- Prior to planting in early spring, broadcast and disc in potash.

## PLAN RECOMMENDATIONS

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### NUTRIENT APPLICATIONS

The previous application schedule includes suggested nutrient application rates by season and field. The following general strategies are recommended:

- Use test strips (checks or control strips) to test changes in a nutrient management program.
- Nitrogen applications can be based on soil or tissue testing, but applications should not exceed the recommendations given for each crop
- For vegetable growers who utilize cover crops and/or manure in their soil management system, care must be taken to account for the nitrogen contribution from these sources
- Soils with > 70 ppm (Bray P1 method) or > 100 ppm (Kelowna method) have sufficient phosphorus for crop needs.
- When applicable, based on the potato variety and timing, consider applying the granular fertilizer in a split application, with the first application banded at the time of planting, and then following applications side dressed around emergence, and final hilling.

### MANURE ESTIMATES

Book values were used to estimate poultry manure nutrient content. During manure applications, use containers to collect a sample to be sent for laboratory analysis. Having the manure nutrient analysis will allow for more accurate application recommendations when the plan is updated next year.

### YIELD RECORDS

During harvest, maintain yield records specific to each field and variety. A combination of yield records, foliar test results, and post-harvest soil test results can be used to calculate the crop nutrient removal and increase the accuracy of updated versions of this nutrient management plan.

### SOIL SAMPLING

For established fields, take soil samples for post-harvest nitrogen after crop harvest, or between August 15 and October 1. Each field's soil should be sampled to a 30 cm depth at 15 cm intervals and analyzed for post-harvest nitrate. Data from post-harvest nitrate testing (PHNT) can be used to determine if nitrogen was over or under applied, and to monitor changes in pH, phosphorus, potassium, calcium and magnesium. Samples should be collected at the same time of year in order to compare results.

Soil post-harvest nitrate and soil phosphorus tests are required every 3 years for each field. Records of soil testing should be kept for at least 5 years. Due to high post-harvest nitrate levels in 2023, the following fields require PHNT soil samples in 2024:

- Main Back - Squash

### FOLIAR TISSUE SAMPLING

Specific plant tissue testing methods (including when and where to sample) and interpretations are limited for many plants. Tissue testing can be used to compare plants when a problem such as a nutrient deficiency is suspected.

## **UPDATING THIS NUTRIENT MANAGEMENT PLAN**

Following soil sampling in fall of 2024, and foliar tissue sampling in late July to August, this plan should be reviewed and updated to more accurately reflect soil nutrient levels, expected yields, and crop nutrient uptake.

## **STRATEGIES TO MEET REGULATORY REQUIREMENTS**

As this farm is in a high-precipitation area, fertilizer cannot be applied from November through January.

Before any nutrient applications in October, February, or March, an application risk assessment must be completed, preferably within 24 hours before application. BC Application Risk Management (ARM) tool can be used for this.

No nutrient applications should be made during high-risk conditions. This includes strong, divergent windy conditions, storm events, when the water table is high and close to the surface, or flooding.

Solid manure must be stored in a permanent structure or as a temporary field storage. In high precipitation areas, field stored manure must be covered from October 1<sup>st</sup>, to April 1<sup>st</sup>. Manure must be used or moved within 7 months after temporary field storage begins. A record of the location for each field storage site, including the kind of material being stored, must be kept on record.

## **RECORDKEEPING FOR NUTRIENT APPLICATION AND CROP YIELDS**

Nutrient application records including type, rate, time and location must be noted and kept on record for 5 years. In addition, crop yields for the fields where nutrient sources are applied must be kept on record for 5 years. The record keeping sheets found in your .nmp file can be used to record rates during nutrient application and crop yields during harvest.

## DISCLAIMER

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The author of this plan, Rick Amundsen, is not responsible for actions taken that deviate from this plan. Additionally, this plan should not be considered an exhaustive list of actions for nutrient management on this farm. The owner and operators of this farm are responsible for following all local, provincial, and federal rules relating to nutrient management.



# APPENDICES

## APPENDIX A: A&L CANADA LABORATORIES SOIL TEST RESULTS

SOIL TEST REPORT															
Sample Number	Depth	Lab Number	Organic Matter	Phosphorus Bray-P1 ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm	pH	CEC meq/100g	Percent Base Saturations					
								Buffer	% K	% Mg	% Ca	% H	% Na		
West Back (Potato)	15 cm	58815	5.6	81	188	110	1247	5.8	6.2	12.7	2.9	12.1	63.9	47.4	0.9
West Front (Beetroot)	15 cm	58816	3.2	126	210	100	431	6.2	6.6	11.7	1.4	10.3	22.0	9.4	1.9
Main Back (Squash)	15 cm	58817	6.7	36	139	161	751	6.4	6.1	15.2	5.4	8.3	59.1	57.4	1.5
Main Front (Broccoli)	15 cm	58818	4.9	50	191	155	1296	6.5	7.0	17.3	3.5	13.9	24.5	16.5	0.5
East (Peas)	15 cm	58819	5.5	154	164	234	811	6.5	6.2	8.4	0.7	11.4	63.8	50.7	1.2

Sample Number	Sulphur S ppm	Nitrate Nitrogen NO <sub>3</sub> ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Saturation		Aluminum AL ppm	K/Mg ENR	Sodium Na ppm	
								% P	% Al		Ratio		
West Back (Potato)	7	19 M	5.9	12.0	120.0	2.1	0.1	7.0	1.7	1402	0.45	85	18
West Front (Beetroot)	13	14 M	10.3	18.0	139.0	2.9	0.1	13.0	2.7	1378	0.36	55	24
Main Back (Squash)	13	29 H	17.9	12.0	89.0	2.8	0.2	41.0	2.2	1202	0.14	63	18
Main Front (Broccoli)	10	12 M	15.9	17.0	137.0	6.1	0.2	39.0	2.5	710	0.34	70	22
East (Peas)	8	6 L	17.4	24.0	113.0	4.5	0.1	10.0	1.6	1094	0.41	60	13

## APPENDIX B: MANURE ANALYSIS

All results are provided on an as-received (wet weight) basis

Source of Material	Material Type	Moisture (%)	Total N (%)	NH <sub>4</sub> N (ppm)	P (%)	K (%)
Leghorn Poultry Farm	Chicken-broiler (general)	50%	2.26	3423	0.91	1.14

## APPENDIX C: SOIL DRAINAGE CLASSES

Code	Class	Description
VR	Very rapidly drained	Water is removed from the soil very rapidly in relation to supply. Excess water flows downward very rapidly if underlying material is pervious. There may be very rapid subsurface flow during heavy rainfall provided there is a steep gradient. Soils have very low available water storage capacity (usually less than 2.5 cm) within the control section and are usually coarse textured, or shallow, or both. Water source is precipitation.
R	Rapidly drained	Water is removed from the soil rapidly in relation to supply. Excess water flows downward if underlying material is pervious. Subsurface flow may occur on steep gradients during heavy rainfall. Soils have low available water storage capacity (2.5-4 cm) within the control section, and are usually coarse textured, or shallow, or both. Water source is precipitation.
W	Well drained	Water is removed from the soil readily but not rapidly. Excess water flows downward readily into underlying pervious material or laterally as subsurface flow. Soils have intermediate available water storage capacity (4-5 cm) within the control section, and are generally intermediate in texture and depth. Water source is precipitation. On slopes subsurface flow may occur for short durations, but additions are equaled by losses.
MW	Moderately well drained	Water is removed from the soil somewhat slowly in relation to supply. Excess water is removed somewhat slowly due to low perviousness, shallow water table, lack of gradient, or some combination of these. Soils have intermediate to high water storage capacity (5-6 cm) within the control section and are usually medium to fine textured. Precipitation is the dominant water source in medium to fine textured soils; precipitation and significant additions by subsurface flow are necessary in coarse textured soils.
I	Imperfectly drained	Water is removed from the soil sufficiently slowly in relation to supply, to keep the soil wet for a significant part of the growing season. Excess water moves slowly downward if precipitation is the major supply. If subsurface water or groundwater, or both, is the main source, the flow rate may vary but the soil remains wet for a significant part of the growing season. Precipitation is the main source if available water storage capacity is high; contribution by subsurface flow or groundwater flow, or both, increases as available water storage capacity decreases. Soils have a wide range in available water supply, texture, and depth, and are gleyed phases of well drained subgroups.
P	Poorly drained	Water is removed so slowly in relation to supply that the soil remains wet for a comparatively large part of the time the soil is not frozen. Excess water is evident in the soil for a large part of the time. Subsurface flow or groundwater flow, or both, in addition to precipitation are the main water sources; there may also be a perched water table, with precipitation exceeding evapotranspiration. Soils have a wide range in available water storage capacity, texture, and depth, and are gleyed subgroups, Gleysols, and Organic soils.
VP	Very poorly drained	Water is removed from the soil so slowly that the water table remains at or on the surface for the greater part of the time the soil is not frozen. Excess water is present in the soil for the greater part of the time. Groundwater flow and subsurface flow are the major water sources. Precipitation is less important except where there is a perched water table with precipitation exceeding evapotranspiration. Soils have a wide range in available water storage capacity, texture, and depth, and are either Gleysolic or Organic.



March 2021

# Spill Reporting

## Report spills immediately

If a spill occurs, or is at imminent risk of occurring, responsible persons (spillers) must ensure that it is immediately reported to the Provincial Emergency Program (PEP)/ Emergency Management British Columbia (EMBC) by calling **1-800-663-3456**.

Section 91.2 of *Environmental Management Act* (EMA) identifies the requirements for spill reporting. The [Spill Reporting Regulation](#) (SRR) prescribes the information that is required, as well as the time and manner in which it is required, when reporting spills.

This Fact Sheet is designed to provide information for responsible persons on their reporting obligations should they be in possession, charge, or control of a substance when it spills or is at imminent risk of spilling.

The SRR identifies three reports that responsible persons must make based on specific criteria: Initial Report; Update to Minister Report; and End-of-Spill Report. Responsible persons may also be required to make a fourth report, a Lessons-Learned Report, if ordered to do so by a director. The purpose of these reports is to ensure that the Ministry of Environment and Climate Change Strategy (the ministry) has the appropriate information necessary to assess spill impacts and fulfil oversight and regulatory roles and responsibilities.

### Responsible Person

A responsible person has possession, charge or control of a substance or thing when a spill of the substance or thing occurs or is at imminent risk of occurring.

### Definition of a Spill

A spill is defined by the *Environmental Management Act* as the introduction into the environment, other than as authorized and whether intentional or unintentional, of a substance or thing that has the potential to cause adverse effects to the environment, human health, or infrastructure.

### Initial Report

Section 4 of the SRR outlines the information required in the Initial Report. An Initial Report must be made immediately if any of the following occur or is at imminent risk of occurring:

- 1. If the volume spilled, or likely to be spilled, is equal to or greater than the minimum quantity outlined in the SRR, the spill is reportable.** A list of substances and their reportable quantities is available in Appendix 2: Prescribed substances and quantities for immediate spill reporting of this Fact Sheet.
- 2. If the spill enters, or is likely to enter, a body of water, the spill is reportable.** A body of water is defined in the SRR and includes both marine and fresh bodies of water whether or not they usually



contain water or ice, as well as streams, lakes, ponds, rivers, creeks, springs, aquifers, ravines, gulches, wetlands, and glaciers. The requirement to report a spill of a listed substance of any quantity also includes spills that enter a ditch that is not self-contained and connects to a body of water.

The Initial Report must be made immediately to EMBC by calling 1-800-663-3456. Anyone can make the Initial Report; however, the responsible person must ensure the report has been made and all the information outlined in section 4 of the SRR has been reported. (Appendix 1)

<b>Natural Gas</b>
A release of natural gas is reportable if: <ol style="list-style-type: none"><li>1. The spill is caused by a breakage in a pipeline or fitting operated above 100 pounds per square inch (psi) that results in a sudden release of natural gas; and</li><li>2. The amount of the spill is, or is likely to be, equal to or greater than 10 kilograms (kg).</li></ol>

### Update to Minister Report

Section 5 of the SRR outlines the requirement for the submission of Update to Minister Reports. Responsible persons must provide an Update to Minister Report:

1. **As soon as possible on request of the minister.**
2. **At least once every 30 days after the date that the spill began** until such time that an End-of-Spill Report is required.
3. **At any time that the responsible person has reason to believe that information that was previously reported as part of the Initial Report, as outlined in Appendix 1, was or has become inaccurate or incomplete.**

If the Update to Minister Report is requested by the Minister or if the spill lasts more than 30 days and the Update to Minister Report is required, an email will be sent by the ministry to the responsible person with instructions on how to complete the report form and how it must be submitted.

If the responsible person believes information previously reported as part of the Initial Report was or has become inaccurate or incomplete, the responsible person can contact the Environmental Emergency Program at [SpillReports@gov.bc.ca](mailto:SpillReports@gov.bc.ca), stating the Dangerous Goods Incident Report number in the subject line, to advise that an Update to Minister Report is required. Instructions on how to complete the report form and how it must be submitted will be sent to the responsible person by email.

### End-of-Spill Report

Section 6 of the SRR outlines the requirement for the submission of End-of-Spill Reports. Responsible persons must submit a written report to the ministry within 30 days following the emergency response completion date of a spill, see information box below. An End-of-Spill Report is required when:

1. **The volume spilled is equal to or greater than the minimum quantity outlined in the SRR.** A list of substances and quantities for immediate spill reporting (is provided in Appendix 2.);
2. **The spill enters, or is likely to enter, a body of water-** 'body of water' is defined in the SRR.

The accountability to adhere to the requirements set out in the SRR is that of the responsible person. All reports, other than the Initial Report, are to be sent to the Environmental Emergency Program at [SpillReports@gov.bc.ca](mailto:SpillReports@gov.bc.ca).

### Emergency Response Completion Date

The emergency response completion date is defined in section 8 of the SRR as the date that all the following criteria are met:

1. The Incident Command Post is disestablished.
2. The source of the spill is under control and is neither spilling nor at imminent risk of spilling.
3. Emergency actions to stabilize, contain, and remove the spill have been taken.
4. The waste has been removed from the spill site.
5. All evacuation notices have expired or been rescinded.
6. All equipment, personnel, and other resources used in emergency spill response actions have been removed from the spill site, other than resources required for sampling, testing, monitoring, assessing the spill site, or for recovery and restoration of the spill site.

### Lessons-Learned Report

Section 7 of the SRR outlines the requirements of a Lessons-Learned Report. Within six months following the emergency response completion date of a spill, the director may order a Lessons-Learned Report from the responsible person. This report must be submitted to the director in the manner and form specified by the director. For additional information on the Lessons-Learned Report, please see the Lessons-Learned Fact Sheet.

### B.C. Oil and Gas Commission Equivalency

Responsible persons regulated by the B.C. Oil and Gas Commission (the Commission) under the [Emergency Management Regulation](#) must provide an Initial Report to EMBC, but are exempt from the following requirements in the SRR:

- Section 5 Update to Minister Report;
- Section 6 End-of-Spill Report; and
- Section 7 Lessons-Learned Report.

### Fines and Penalties

It is the responsibility of regulated persons, responsible persons and the owners of substances or things to understand and comply with EMA and its associated regulations.

This document is solely for the convenience of the reader and is intended to assist in understanding the legislation and regulations, not replace them. It does not contain and should not be construed as legal advice. Current legislation and regulations should be consulted for complete information.

Failure to be in compliance can result in convictions of fines and imprisonment, as outlined in *EMA* and its associated regulations.

### Additional Fact Sheets

Fact sheets on other relevant topics are published by the Environmental Emergency Program (EEP) and available at:

[www.gov.bc.ca/spillresponse](http://www.gov.bc.ca/spillresponse)

The complete list of available Fact Sheets:

- 01 Regulated Person
- 02 Responsible Person
- 03 Spill Reporting
- 04 Lessons-Learned Report
- 05 Cost Recovery
- 06 Requirement to Provide Information
- 07 Spill Contingency Planning
- 08 Testing Spill Contingency Plans
- 09 Recovery Plan

**For more information, contact the  
Environmental Emergency Program  
at: [SpillReports@gov.bc.ca](mailto:SpillReports@gov.bc.ca)**

## Appendix 1: Initial Report content

Report information	Description
1. Contact information of the individual making the report	First and last name, phone number, and email address
2. Contact information of the responsible person	First and last name, phone number, and email address
3. Contact information for the owner of the substance spilled	First and last name, phone number, and email address
4. Location, date, and time of the spill	Provide as much location specific information as possible, including: general directions, description of how to approach the area, latitude and longitude if available, street address, and the date and time in 24-hour clock format
5. Description of the spill site and surrounding area	Provide a description of the receiving environment of the spilled material (for example, the area is wooded and the ground is soft; there are sensitive riparian areas that are at risk of contamination)
6. A description of the source of the spill	The container from which the material spilled (for example, fishing vessel, above- or below-ground storage tank, tanker truck, pipeline, or railcar)
7. Type and quantity of the substance spilled	An estimate of the amount of product spilled and a description of the product type, including product name, UN number, and Safety Data Sheet [SDS] (for example, diesel, UN 1202, 50 liters). If unknown, a description of the spill (for example, sheen or slick approximately 20 meters by 20 meters)
8. Cause and impact of the spill	The circumstances leading to the spill; the immediate cause as well as any contributing factors. May be a combination of the activity and the incident (for example, motor vehicle accident, derailment, equipment failure, fire, human error, intentional/unauthorized release, natural occurrence, or unknown)
9. Details of the actions taken or proposed	Provide any necessary/ helpful details of the actions taken or planned (for example, what steps have been taken to contain the spill, which responders have been deployed, and when they will be on scene)
10. The details of further action contemplated or required	Provide any necessary/ helpful details regarding next steps, including response actions, deployment of additional resources, and monitoring activities
11. The names of agencies on scene	Any persons, government, federal government, local government, or Indigenous agencies
12. The names of other persons or agencies advised concerning the spill	Any persons, government, federal government, local government, or Indigenous agencies

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**Appendix 2: Prescribed substances and quantities for immediate spill reporting<sup>1</sup>**

Item	Column 1 Substance Spilled	Column 2 Specified Amount
1	Class 1, Explosives as defined in <a href="#">section 2.9 of the Federal Regulations<sup>2</sup></a>	50 kg, or less if the substance poses a danger to public safety
2	Class 2.1, Flammable Gases, other than natural gas, as defined in <a href="#">section 2.14 (a) of the Federal Regulations</a>	10 kg
3	Class 2.2 Non-Flammable and Non-Toxic Gases as defined in <a href="#">section 2.14 (b) of the Federal Regulations</a>	10 kg
4	Class 2.3, Toxic Gases as defined in <a href="#">section 2.14 (c) of the Federal Regulations</a>	5 kg
5	Class 3, Flammable Liquids as defined in <a href="#">section 2.18 of the Federal Regulations</a>	100 L
6	Class 4, Flammable Solids as defined in <a href="#">section 2.20 of the Federal Regulations</a>	25 kg
7	Class 5.1, Oxidizing Substances as defined in <a href="#">section 2.24 (a) of the Federal Regulations</a>	50 kg or 50 L
8	Class 5.2, Organic Peroxides as defined in <a href="#">section 2.24 (b) of the Federal Regulations</a>	1 kg or 1 L
9	Class 6.1, Toxic Substances as defined in <a href="#">section 2.27 (a) of the Federal Regulations</a>	5 kg or 5 L
10	Class 6.2, Infectious Substances as defined in <a href="#">section 2.27 (b) of the Federal Regulations</a>	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
11	Class 7, Radioactive Materials as defined in <a href="#">section 2.37 of the Federal Regulations</a>	Any quantity that could pose a danger to public safety and an emission level greater than the emission level established in section 20 of the Packaging and Transport of Nuclear Substances Regulations, 2015 (Canada)
12	Class 8, Corrosives as defined in <a href="#">section 2.40 of the Federal Regulations</a>	5 kg or 5 L
13	Class 9, Miscellaneous Products, Substances or Organisms as defined in <a href="#">section 2.43 of the Federal Regulations</a>	25 kg or 25 L

<sup>1</sup> If the spill enters, or is likely to enter, a body of water, it is reportable regardless of the quantity  
<sup>2</sup> Federal regulations refer to the Transportation of Dangerous Goods Regulations under the *Transportation of Dangerous Goods Act 1992*  
<sup>3</sup> Hazardous Waste Regulation refers to B.C. Reg. 63/88



14	Waste containing dioxin as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
15	Leachable toxic waste as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	25 kg or 25 L
16	Waste containing polycyclic aromatic hydrocarbons as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	5 kg or 5 L
17	Waste asbestos as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	50 kg
18	Waste oil as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	100 L
19	Waste that contains a pest control product as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	5 kg or 5 L
20	PCB wastes as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	25 kg or 25 L
21	Waste containing tetrachloroethylene as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	50 kg or 50 L
22	Biomedical waste as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a>	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
23	A hazardous waste as defined in <a href="#">section 1 of the Hazardous Waste Regulation</a> and not covered under items 1 – 22	25 kg or 25 L
24	A substance, not covered by items 1 to 23, that can cause pollution	200 kg or 200 L
25	Natural gas	10 kg, if there is a breakage in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release of natural gas

## APPENDIX E: RECORD KEEPING SHEETS

Field: West Back	Area: 12.3 ac	Crop: Potatoes-midseason	Actual Yield:
2024 Plan		2024 Records	
Nutrient Source	Application Timing	Rate	Notes or modifications to plan
Chicken-broiler manure (general)	Spring 2024	3 yards <sup>2</sup> /ac	
Muriate of potash (0-0-62)	May 2024	100 lb/ac	
Urea (46-0-0)	May 2024	150 lb/ac	

Field: West Front	Area: 8.3 ac	Crop: Beets	Actual Yield:
2024 Plan		2024 Records	
Nutrient Source	Application Timing	Rate	Notes or modifications to plan
Muriate of potash (0-0-62)	June 2024	50 lb/ac	
8-18-22	June 2024	150 lb/ac	

Field: Main Back	Area: 13.2 ac	Crop: Squash-zucchini, other	Actual Yield:
2024 Plan		2024 Records	
Nutrient Source	Application Timing	Rate	Notes or modifications to plan
Muriate of potash (0-0-62)	May 2024	50 lb/ac	
8-18-22	May 2024	300 lb/ac	
Urea (46-0-0)	June 2024	75 lb/ac	

Field: Main Front	Area: 19.6 ac	Crop: Broccoli	Actual Yield:
2024 Plan		2024 Records	
Nutrient Source	Application Timing	Rate	Notes or modifications to plan
Chicken-broiler (general)	Spring 2024	4 yards <sup>2</sup> /ac	
Muriate of potash (0-0-62)	April 2024	50 lb/ac	
Urea (46-0-0)	June 2024	125 lb/ac	

Field: East	Area: 25.1 ac	Crop: Peas	Actual Yield:
2024 Plan		2024 Records	
Nutrient Source	Application Timing	Rate	Notes or modifications to plan
Muriate of potash (0-0-62)	April 2024	100 lb/ac	

