Appendix B

Design Quantities

Appendix B - Design Quantities
Table B1 - Summary of Design Quantities

Item	Granular Material							Liner Material		Contaminated Soil[a]					Debris[a]	
												Hydrocarbon				
	Type 1 (m^3)	Type 2 (m^3)	Type 2A (m^3)	Type 3 (m^3)	Type 4 (m^3)	Type 5 (m^3)	Type 6 (m^3)	Geotextile (m^2)	HDPE Geomembrane (m^2)	Tier I (m^3)	Tier II (m^3)	Type A (m^3)	Type B (m^3)	Hazardous (m^3)	Non-hazardous (m^3)	Hazardous (m^3)
Contaminated Soil		162.0		910.7							151.5		753.0	6.2		
Buried Debris Areas		3899.0		502.4						57.8	82.4				105.2	4.9
Surface Debris/Barrels															39.4	1.5
Structure Demolition															474.3	140.8
CSTF		3861.1				703.9		6731.3	3365.6							
Design Quantity		**7922.1**		**1413.0**		**703.9**		**6731.3**	**3365.6**	**57.8**	**233.9**	**0.0**	**753.0**	**6.2**	**618.9**	**147.2**
Design Contingency		10%		10%		10%		15%	15%	0%	0%	0%	0%	0%	15%	15%
Design Quanity (with Contingency)		**8714.3**		**1554.4**		**774.3**		**7741.0**	**3870.5**	**57.8**	**233.9**	**0.0**	**753.0**	**6.2**	**696.0**	**168.6**
Bulking Factor		25%		25%		25%		0%	0%	25%	25%	25%	25%	25%	25%	25%
Total Design Quantity		**10893.0**		**1943.0**		**968.0**		**7741.0**	**3871.0**	**73.0**	**293.0**	**0.0**	**942.0**	**8.0**	**871.0**	**211.0**

[a]Design contingencies applied in Table B2 and Table B3.

Appendix B - Design Quantities
Table B2 - Contaminated Soil Areas

Location	Area	Contaminants	Tier I		Tier II		PHC Type A		PHC Type B		Hazardous		% Contingency (relative to estimated volume)	Tier I		Tier II		PHC Type A		PHC Type B		Hazardous	
			Area (m^2)	Depth (m)	Area (m^2)	Depth (m)	Area (m^2)	Depth (m)	Area (m^2)	Depth (m)	Area (m^2)	Depth (m)		Min. (m^3)	Des. (m^3)	Min. (m^3)	Des. (m^3)	Min. (m^3)	Des. (m^3)	Min. (m^3)	Des. (m^3)	Min. (m^3)	Des. (m^3)
Garage	Area 1	PCBs, Cu			0.8	0.6							50%	0.0	0.0	0.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0
	Area 2	PCBs	18.2	0.3									30%	5.5	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Area 3	Cu			5.5	0.6							30%	0.0	0.0	3.3	4.3	0.0	0.0	0.0	0.0	0.0	0.0
	Area 4	PCBs	6.2	0.3									30%	1.9	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North of Garage	Area 1	PCBs, Cu			76.9	0.3							20%	0.0	0.0	23.1	27.7	0.0	0.0	0.0	0.0	0.0	0.0
	Area 2	PCBs	7.6	0.3									20%	2.3	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Warehouse	Area 1	PCBs	36.4	0.3									10%	10.9	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Module Train	Area 1	PCBs, Zn	88.3	0.3	116.2	0.6							30%	26.5	34.4	69.7	90.6	0.0	0.0	0.0	0.0	0.0	0.0
	Area 2	PCBs			15.6	0.3							10%	0.0	0.0	4.7	5.1	0.0	0.0	0.0	0.0	0.0	0.0
	Area 3	PCBs	20.3	0.3	44.2	0.4					15.8	0.3	30%	6.1	7.9	17.7	23.0	0.0	0.0	0.0	0.0	4.7	6.2
	Area 4	PCBs	6.2	0.3									50%	1.9	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Area 5	PCBs	28.1	0.3									10%	8.4	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Area 6	PCBs	38.7	0.3									10%	11.6	12.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Station POL	Area 1	Type B PHCs							14.3	1.3			30%	0.0	0.0	0.0	0.0	0.0	0.0	18.6	24.2	0.0	0.0
	Area 2	Type B PHCs							101.3	0.8			30%	0.0	0.0	0.0	0.0	0.0	0.0	81.0	105.4	0.0	0.0
	Area 3	Type B PHCs							400.2	1.0			30%	0.0	0.0	0.0	0.0	0.0	0.0	400.2	520.3	0.0	0.0

Location	Area	Contaminants	Tier I		Tier II		PHC Type A		PHC Type B		Hazardous		% Contingency (relative to estimated volume)	Tier I		Tier II		PHC Type A		PHC Type B		Hazardous	
			Area (m^2)	Depth (m)	Area (m^2)	Depth (m)	Area (m^2)	Depth (m)	Area (m^2)	Depth (m)	Area (m^2)	Depth (m)		Min. (m^3)	Des. (m^3)	Min. (m^3)	Des. (m^3)	Min. (m^3)	Des. (m^3)	Min. (m^3)	Des. (m^3)	Min. (m^3)	Des. (m^3)
Beach POL	Area 1	Type B PHCs							58.7	0.5			30%	0.0	0.0	0.0	0.0	0.0	0.0	29.4	38.2	0.0	0.0
	Area 2	Type B PHCs							43.4	1.0			50%	0.0	0.0	0.0	0.0	0.0	0.0	43.4	65.1	0.0	0.0
SDA-4		Type A PHCs					4.3	0.5					20%	0.0	0.0	0.0	0.0	2.2	2.6	0.0	0.0	0.0	0.0
													Total	**75.0**	**91.5**	**118.9**	**151.5**	**2.2**	**2.6**	**572.6**	**753.0**	**4.7**	**6.2**

Appendix B - Design Quantities
Table B3 - Buried Debris Areas

Debris Area	Location	AMSRP Classification	Remedial Approach	Anomaly Area (m^2)	Design Area (m^2)	Design Perimeter (m)	Estimated Debris Depth (m)	Re-grade Fill Volume (m^3)	Estimated Excavation Volume (m^3)	Non-hazardous Debris Fraction	Estimated Non-hazardous Material (m^3)	Hazardous Debris Fraction	Estimated Hazardous Material (m^3)	Tier I Soil Fraction	Estimated Tier I Soil (m^3)	Tier II Soil Fraction	Estimated Tier II Soil (m^3)	Estimated Clean Fill (m^3)	Estimated Backfill Volume (m^3)
1a	BDA-1 is located along the Main Station ridge approximately 230 m southwest of the Main Station.	Class C	Excavate	186	210	57	1.5		315.0	10.0%	31.5	0.0%	0.0	0.0%	0.0	0.0%	0.0	31.5	283.5
1b		Class C	Excavate	136	139	44	5.0		347.5	15.0%	52.1	1.0%	3.5	12.5%	43.4	17.5%	60.8	187.7	159.9
1c		Class C	Re-grade	108	273	88		414.0											
1d		Class C	Re-grade	74	508	102		705.0											
1e		Class C	Re-grade	125	Combined with 1d			Combined with 1d											
							Subtotal	**1119.0**	**662.5**		**83.6**		**3.5**		**43.4**		**60.8**	**219.2**	**443.4**
2a	BDA-2 is located along the Main Station ridge approximately 170 m west of BDA-1.	Class C	Re-grade	855	1932	234		1672.0											
2b		Class C	Re-grade	91	Combined with 2a			Combined with 2a											
2c		Class C	Re-grade	117															
							Subtotal	**1672.0**	**0.0**		**0.0**		**0.0**		**0.0**		**0.0**	**0.0**	**0.0**
3a	BDA-3 is located along the Main Station ridge approximately 390 m west of BDA-2.	Class C	Re-grade	135	291	65		273.0											
3b		Class C	Re-grade	562	820	112		835.0											
							Subtotal	**1108.0**	**0.0**		**0.0**		**0.0**		**0.0**		**0.0**	**0.0**	**0.0**
4a	BDA-4 is located at the Beach (northwest portion).	Class C	Excavate	53	64	30	0.8		48.0	15.0%	7.2	1.0%	0.5	10.0%	4.8	15.0%	7.2	28.3	19.7
4b		Class C	Excavate	23	128	57	0.8		96.0	15.0%	14.4	1.0%	1.0	10.0%	9.6	15.0%	14.4	56.6	39.4
4c		Class C	Excavate	80	Combined with 4b			Combined with 4b											
							Subtotal	**0.0**	**144.0**		**21.6**		**1.4**		**14.4**		**21.6**	**85.0**	**59.0**
							Total	**3899.0**	**806.5**		**105.2**		**4.9**		**57.8**		**82.4**	**304.1**	**502.4**

Appendix B - Design Quantities
Table B4 - Surface Debris Areas

Debris Area	Location	Description	Barrel Sampling Results	Estimated Areal Extent (m^2)	Estimated Uncrushed Volume (m^3)	Estimated Quantity of Barrels (m^3)	Estimated Crushed Volume (m^3)	Estimated Hazardous Volume - Barrel Contents (m3)	Estimated Hazardous Volume - Other (m3)
SDA-1	SDA-1 is located along the Main Station ridge approximately 230 m southwest of the Main Station and encompasses BDA-1. Access to this area is good.	SDA-1 consists of an area of scattered debris. Debris includes, but is not limited to, the following: 10 metal barrels, and miscellaneous debris (see Appendix C for photographs).	Barrels were agitated to determine the presence of liquid contents. No barrel contents were observed in SDA-1.	5127	1.0	10.0	0.7	0.0	0.0
SDA-2	SDA-2 is located along the Main Station ridge approximately 170 m west of SDA-1 and encompasses BDA-2. Access to this area is good.	SDA-2 consists of an area of scattered debris. Debris includes, but is not limited to, the following: 3 metal barrels, scrap metal (e.g., equipment components, rubbish), scrap wood (e.g., pallets, plywood), and miscellaneous debris (see Appendix C for photographs).	Barrels were agitated to determine the presence of liquid contents. No barrel contents were observed in SDA-2.	2752	1.0	3.0	0.6	0.0	0.0
SDA-3	SDA-3 is located along the Main Station ridge approximately 390 m west of SDA-2 and encompasses BDA-3. Access to this area is good.	SDA-3 consists of an area of scattered debris. Debris includes, but is not limited to, the following: 10 metal barrels, scrap metal (e.g., rubbish), and miscellaneous debris (see Appendix C for photographs).	Barrels were agitated to determine the presence of liquid contents. No barrel contents were observed in SDA-3.	2801	1.0	10.0	0.7	0.0	0.0
SDA-4	SDA-4 is located at the Beach and encompasses BDA-4. Access to this area is good.	SDA-4 consists of three areas of concentrated debris with scattered debris surrounding these areas. Debris includes, but is not limited to, the following: approximately 51 metal barrels, scrap metal (e.g., mechanical parts, rubbish), scrap wood (e.g., plywood), potentially hazardous materials (e.g., organic barrel contents), and miscellaneous debris (see Appendix C for photographs).	Barrels were agitated to determine the presence of liquid contents. Liquid depth of approx. 2 cm, 8 cm, and 41 cm was measured in three barrels. The liquid consisted of organic phase. It is estimated that approx. 1.5 m^3 of organic barrel contents are present in SDA-4 (volume subject to change).	12871	1.0	51.0	1.6	1.5	0.0
SDA-5	SDA-5 is located at the Beach. Access to this area is good.	SDA-5 consists of two areas of concentrated debris with scattered debris surrounding these areas. Debris includes, but is not limited to, the following: approxiamtely 169 metal barrels, a bathtub, metal scrap (e.g., framing, piping), scrap wood (e.g., pallets, crates), and miscellaneous debris (see Appendix C for photographs).	Barrels were agitated to determine the presence of liquid contents. No barrel contents were observed in SDA-5.	18314	5.0	169.0	6.2	0.0	0.0
SDA-6	SDA-6 is located along the northeast shore of the East Lake approximately 1.7 km east of the Main Station. Access to this area is good.	SDA-6 consists of an area of scattered debris. Debris includes, but is not limited to, the following: approximately 2 metal barrels, scrap wood (e.g., pallets, framing), scrap metal (e.g., rubbish), and miscellaneous debris (see Appendix C for photographs).	Barrels were agitated to determine the presence of liquid contents. No barrel contents were observed in SDA-6.	9105	2.0	2.0	1.6	0.0	0.0
SDA-7	SDA-7 is located along the northeast shore of the East Lake approximately 180 m southeast of SDA-5. Rough ground in this area was observed during the 2022 field program. Access to this area my be restricted to ATVs only.	SDA-7 consists of an area of concentrated debris with scattered debris surrounding the area. Debris includes, but is not limited to, the following: approximately 13 metal barrels, metal cables, scrap wood (e.g., framing, siding), scrap metal (e.g., piping, rubbish), and miscellaneous debris (see Appendix C for photographs).	Barrels were agitated to determine the presence of liquid contents. No barrel contents were observed in SDA-7.	21538	2.0	13.0	1.9	0.0	0.0
SDA-8	SDA-8 is located along the southeast shore of the East Lake approximately 400 m south of SDA-5. Rough ground in this area was observed during the 2022 field program. Access to this area my be restricted to ATVs only.	SDA-8 consists of an area of concentrated debris. Debris includes, but is not limited to, the following: approximately 3 metal barrels, scrap wood (e.g., framing, siding, furniture), scrap metal (e.g., piping, rubbish), electrical components, potentially hazardous materials (e.g., asbestos pipe wrap), and miscellaneous debris (see Appendix C for photographs).	Barrels were agitated to determine the presence of liquid contents. No barrel contents were observed in SDA-8.	3325	10.0	3.0	8.1	0.0	0.5
SDA-9	SDA-9 is located along the southeast shore of the East Lake approximately 180 m west of SDA-6. Rough ground in this area was observed during the 2022 field program. Access to this area my be restricted to ATVs only.	SDA-9 consists of an area of concentrated debris. Debris includes, but is not limited to, the following: scrap wood (e.g., framing, siding), scrap metal (e.g., piping, rubbish), electrical components, and miscellaneous debris (see Appendix C for photographs).	Barrels were agitated to determine the presence of liquid contents. No barrel contents were observed in SDA-9.	3325	2.0	0.0	1.6	0.0	0.0

Debris Area	Location	Description	Barrel Sampling Results	Estimated Areal Extent (m^2)	Estimated Uncrushed Volume (m^3)	Estimated Quantity of Barrels (m^3)	Estimated Crushed Volume (m^3)	Estimated Hazardous Volume - Barrel Contents (m3)	Estimated Hazardous Volume - Other (m3)
SDA-10	SDA-10 is located at the Main Station and encompasses the area surrounding the Garage, Warehouse, Module Train and Station POL Pad. Access to this area is good.	SDA-10 consists of an area of scattered debris. Debris includes, but is not limited to, the following: approximately 39 metal barrels, large metal vessels, metal frames, metal cables, wood timbers, scrap metal (e.g., sheet metal, fittings, valves, rubbish), miscellaneous electrical parts, metal piping, remnants of old POL pumphouse (i.e., sheet metal siding, metal piping), and miscellaneous debris (see Appendix C for photographs).	Barrels were agitated to determine the presence of liquid contents. A liquid depth of approx. 5 cm was measured in one barrel. The liquid consisted of rust coloured aqueous phase. No organic phase was observed. It is estimated that approx. 0.5 m^3 of aqueous barrel contents are present in SDA-10 (volume subject to change).	25277	15.0	39.0	11.4	0.5	1.0
SDA-11	SDA-11 is located along the Main Station ridge approximately 500 m west of SDA-10. Access to this area is good.	SDA-11 consists of an area of concentrated debris. Debris includes, but is not limited to, the following: approximately 34 metal barrels, metal storage units, metal cables, one large metal vessel, scrap wood (e.g., pallets), scrap metal (e.g., valves, fittings, rubbish), and miscellaneous debris (see Appendix C for photographs).	Barrels were agitated to determine the presence of liquid contents. A liquid depth of approx. 3 cm was measured in one barrel. The liquid consisted of rust coloured aqueous phase. No organic phase was observed. It is estimated that approx. 0.3 m3 of aqueous barrel contents are present in SDA-10 (volume subject to change).	1669	2.0	34.0	1.7	0.3	0.0
SDA-12	SDA-12 is located down from the Main Station ridge approximately 230 m southeast of SDA-11. There was some standing water in this area during the 2022 field program. Access to this area may be restricted to low ground pressure vehicles only.	SDA-12 consists of an area of scattered debris. Debris includes, but is not limited to, the following: approximately 12 metal barrels (see Appendix C for photographs).	Barrels were not agitated to determine the presence of liquid contants due to access limitations. The presence of barrel contents in SDA-12 is unknown.	5708	0.0	12.0	0.3	0.0	0.0
POL Line	The POL Line is located between the Main Station POL Pad and the Beach POL Pad spanning approximately 2.6 km. Rough ground in this area was observed during the 2022 field program. Access to this area my be restricted to ATVs only.	The POL Line consists of the remnants of the old pipeline that stretched from the Main Station to the Beach Area. Debris includes, but is not limited to, the following: approximately 94 metal barrels, metal scrap (e.g., piping), and miscellaneous debris (see Appendix C for photographs).	Barrels were not agitated to determine the presence of liquid contants due to access limitations. The presence of barrel contents along the POL Line is unknown.	50000	2.0	94.0	3.1	0.0	0.0
			Total	**161812**	**44.0**	**440.0**	**39.4**	**2.3**	**1.5**

Appendix B - Design Quantities
Table B5 - Demolition Assessment

Structure	Construction / Contents	Sample Results					Hazardous			Notes
		Asbestos (%)	Total Pb (mg/L)	TCLP Pb (mg/L)	PCBs (mg/kg)	Non-hazardous (m^3)	PAP (m^3)	PAP Asbestos (m^3)	Asbestos (m^3)	
Garage	**Structural steel braced frame with exterior metal cladding and interior metal panels on concrete footings. Dimensions (approx.): 12.6 m x 10.5 m x 6.8 m**									
	Building envelope (including cladding and insulation)				**38.6, 156, 200**	70.8	10.2			Interior metal panels are approx. 1" thick (estimate). Painted (see Sampling Results).
	Overhead doors						4.5			Painted (see Sampling Results).
	Interior walls, partitions, ceiling, doors						3.7			Painted (see Sampling Results).
	Structural steel						7.0			Painted (see Sampling Results).
	Mezzanine (including stairs, deck, beams)						4.5			Painted (see Sampling Results).
	Contents									
	Furnace (including piping, asbestos wrap)	Visual			**38.6, 156, 200**	1.0		1.0		Includes PAP asbestos pipe wrap.
	Boiler (including piping, asbestos wrap)					1.0		1.0		Includes PAP asbestos pipe wrap.
	CO_2 cylinders					1.0				
	Scrap metal (e.g., shelving, workbench)					1.0				
	Hazardous materials (e.g., painted/unpainted asbestos wrap, transite boards, asbestos core doors)	Visual			See above			1.0	1.0	Includes contingency.
					Subtotal	**74.8**	**29.9**	**3.0**	**1.0**	
Warehouse	**Structural steel braced frame with exterior metal cladding and interior metal panels on concrete footings. Dimensions (approx.): 12.6 m x 8.9 m x 6.8 m**									
	Building envelope (including cladding and insulation)				**250, 9960, 13200**	18.6	1.4			Interior metal panels are approx. 0.5" thick (estimate) and interior plywood walls are approx. 1" thick (estimate). Painted (see Sampling Results).
	Interior walls, partitions					1.0	2.0			Painted (see Sampling Results).
	Structural steel					5.0				
	Concrete slab and footings					45.2				
	Access steps				**250, 9960, 13200**		3.0			Painted (see Sampling Results).
	Vestibule						5.0			Painted (see Sampling Results).
	Plywood floor					1.0				
	Floor tiles	**1-5**							0.5	ACM (see Sampling Results).
	Contents									
	Furnace (including piping, asbestos wrap)	Visual				2.5		0.5		
	Water tank (including piping, asbestos wrap)				**9960**	0.5		0.5		Includes PAP asbestos pipe wrap.
	CO_2 cylinders					0.5				
	Hazardous materials (e.g., painted/unpainted asbestos wrap, transite boards, asbestos core doors)	Visual			See above			1.0	1.0	Includes contingency.
					Subtotal	**74.3**	**11.4**	**2.0**	**1.5**	
Module Train	**Five joined 4.9 m modules. Wood frame construction. Painted timber crib foundation. Dimensions (approx.): 24.5 m x 8.6 m x 4.6 m**									
	Timber crib foundation				**115, 534**			30.3		
	Floor and ceiling				**3400, 8460, 15000, 7560**	77.3		10.7		Floor and ceiling are approx. 1" thick (estimate). Painted (see Sampling Results).
	Walls					45.0		12.1		Exterior and interior plywood walls are approx. 1" thick (estimate). Painted (see Sampling Results).
	Concrete floor					1.5				
	Exterior stairs				**115, 534**			9.0		
	Floor tiles	**1-5**							1.0	
	Contents									
	Water tanks				**8460**		11.8	1.0		Includes PAP asbestos pipe wrap.
	Electrical cabinets					9.0				
	CO_2 cylinders					2.0				
	Miscellaneous mechanical/piping	**5-10, 25-50**				6.0		6.0		Includes PAP asbestos pipe wrap.
	Hazardous materials (e.g., painted/unpainted asbestos wrap, transite boards, asbestos core doors, vermiculite)	Visual			See above			2.5	2.5	Includes contingency.
					Subtotal	**140.8**	**11.8**	**71.6**	**3.5**	
Inuit House	**Wood frame structure with wood roof on shallow wood foundation. Dimensions (approx.): 7.4 m x 7.4 m x 3.0 m**									
	Building envelope, interior walls				**7560**	20.4	4.6			Exterior and interior plywood walls are approx. 1" thick (estimate). Painted (see Sampling Results).
	Floor tiles	**<1**							0.5	
	Contents									
	Miscellaneous debris (e.g., stove, barrel, light fixture)					1.0				
					Subtotal	**21.4**	**4.6**	**0.0**	**0.5**	
Antenna	**Steel pipe and beam construction with associated communication cables. Triangular cross-section: 65 m x 5 m x 5 m**									
	Structural steel frame (including associated anchors and cables)					163.0				Assumed to be approx. 10% of total volume.
					Subtotal	**163.0**	**0.0**	**0.0**	**0.0**	
					Total	**474.3**	**57.7**	**76.6**	**6.5**	

Appendix D

Photographs

APPENDIX D: PHOTOGRAPHS

Client Name: Public Services and Procurement Canada	Site Location: PIN-C Bernard Harbour	Project Number: 60688145

Photo No. 1	Date: 07/30/2022

Direction Photo Taken: Northwest

Description: BDA-1.

Photo No. 2	Date: 07/30/2022

Direction Photo Taken: Southeast

Description: BDA-1d and BDA-1e. At the toe of the slope.