

Appendix G6

2016 Blast Monitoring Report for the Protection of Nearby Fish Habitat

ANNUAL REPORT MEMORANDUM

Agnico Eagle Mines Ltd Meadowbank Division
Environment Department

SUBJECT: 2016 Blast Monitoring Report for the Protection of Nearby Fish Habitat

1- Introduction and Objectives

In accordance with NIRB Project Certificate No.004, Condition 85, Agnico Meadowbank Division developed a blasting program which complies with *The Guidelines for the Use of Explosives In or Near Canadian Fisheries Water* (Wright and Hopky, 1998) as modified by the DFO for use in the North. As a result, Agnico conducts monitoring to evaluate blast related peak particle velocity and overpressure to protect nearby fish bearing waters.

The detonation of explosives in or near water produces compressive shock waves that can cause significant impacts to the swim bladders of fish, rupture other internal organs and/or damage or kill fish eggs and larvae. In addition, the effects of the shock waves can be intensified in the presence of ice. Consequently, *the Guidelines for the Use of Explosives In or Near Canadian Fisheries Water* guidelines have been developed by DFO to protect fish and fish habitat from works or undertakings that involve explosives in or near fisheries waters. It includes the following requirements:

1. No explosive is to be detonated in or near fish habitat that produces an instantaneous pressure change (IPC) greater than 100 kPa in the swim bladder of a fish; representatives from DFO requested that Agnico use a value of 50 kPa instead of 100 kPa; and
2. No explosive is to be detonated that produces a peak particle velocity greater than 13 mm/s in a spawning bed during the period of egg incubation (for lakes near the Meadowbank mine, it takes place between August 15 and June 30).

Peak particle velocity (PPV) and overpressure monitoring data was recorded throughout 2016 during blasting activities at the North Portage Pit, South Portage Pit, and Vault Pit. The locations of the blast monitoring stations in 2016 are called Portage Pit North (14W 7214597N 639457E), Portage Pit South (14W 7213663N 639349E) and Vault Pit station #2 (15W 7220873N 359907E). These monitoring stations are illustrated in Figure 1 for Portage and Figure 2 for Vault Pit. The Portage stations are located near the shoreline of Second Portage Lake. The Vault Pit station #2 is located near Wally Lake.

No more blast monitoring was conducted at Goose Pit in 2016 as mining has ceased in this pit since April 2015. The blast monitoring station (Goose Pit (14W 7212116N 638881E)) was originally situated on the Bay Goose Dike near the Third Portage Lake East Basin. Vault Pit station #1 (14W 7219726N 640741E), located between the Vault Attenuation Pond (dewatered Vault Lake) and the Vault Pit, was also not monitored in 2016 as the nearest potential fish habitat is in Wally Lake and the Vault Pit station #2 is used to monitored the potential impact. These monitoring stations are also illustrated in Figure 1 and Figure 2 for Vault Pit.



Figure 1 - Portage and Goose Pit Blast Monitoring Stations

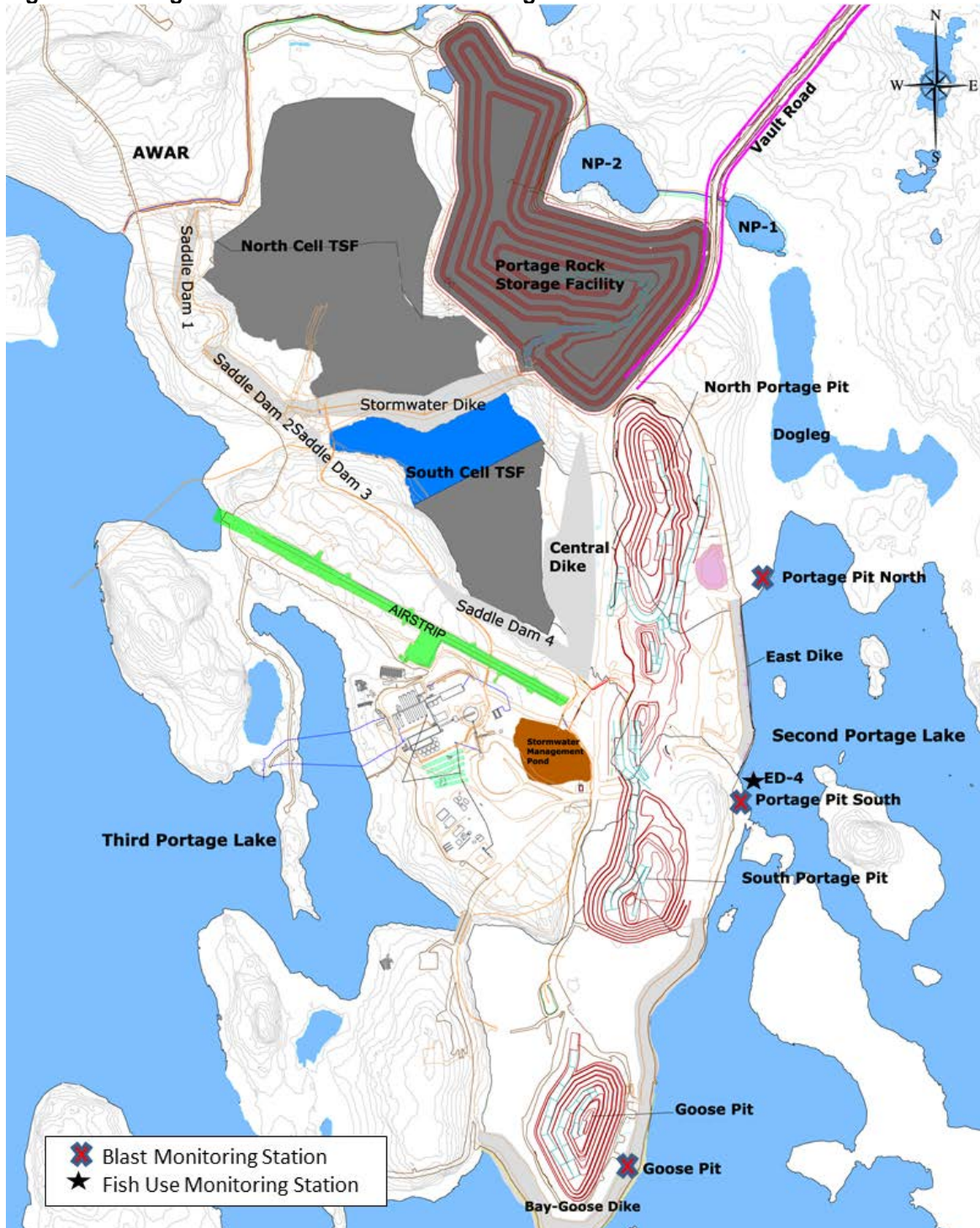
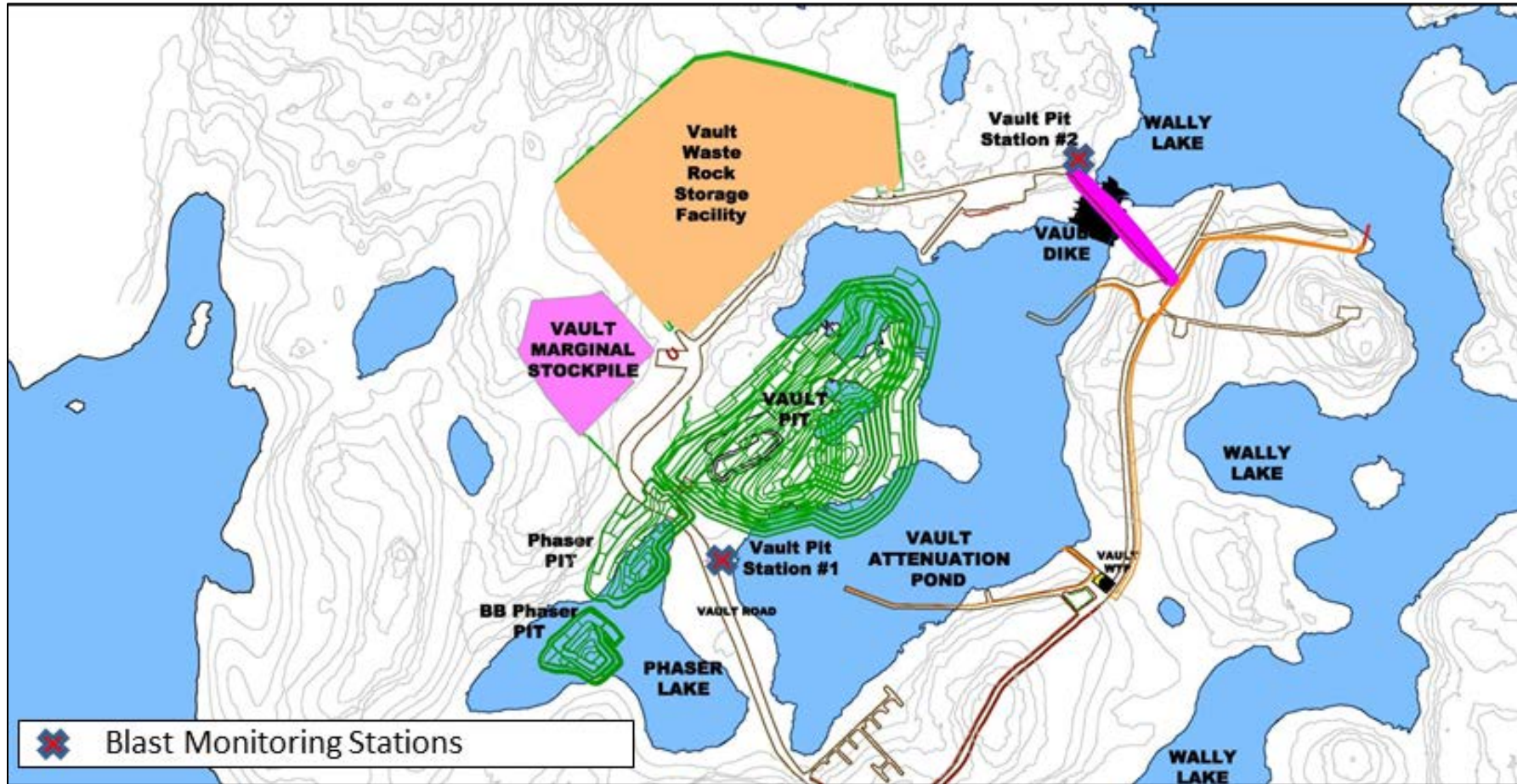


Figure 2 - Vault Pit Blast Monitoring Stations



2- Methods

2.1- Blast Monitoring

Blasts were monitored using an InstanTel Minimate Blaster which is fully compliant with the international Society of Explosives and Engineers performance specifications for blasting seismographs (InstanTel, 2005). The Minimate Blaster has three main parts: a monitor, a standard transducer (geophone) and a microphone. The monitor contains the battery and electronic components of the instrument. It also checks the two sensors to ensure they are functioning. The transducer measures ground vibration with a mechanism called a geophone.

This instrument measures transverse, vertical and longitudinal ground vibrations. Transverse ground vibrations agitate particles in a side to side motion. Vertical ground vibrations agitate particles in an up and down motion. Longitudinal ground vibrations agitate particles in a back and forth motion progressing outward from the event site (InstanTel, 2005). The Minimate Blaster calculates the PPV for each geophone and calculates the vector sum of the three axes. The final result is the Peak Vector Sum (PVS) and is the resultant particle velocity magnitude of the event:

$$PVS = \sqrt{(T^2 + V^2 + L^2)}$$

Where:

T = particle velocity along the transverse plane

V = particle velocity along the vertical plane

L = particle velocity along the longitudinal plane

The transducer is installed as per the model specifications. All monitoring follows Agnico (2017) Blast Monitoring Plan.

2.2- Data Analysis

The blast monitoring data was screened to ensure blast PPV and IPC monitoring results corresponded to a single blast event. As previously discussed, in 2016 the blast engineers thoroughly documented blast patterns, sequencing, and detonation results to track the material accurately, optimize blasts and review procedures. As a result, blast monitoring data is collected as a composite of blast patterns and may include multiple blast patterns that could have occurred during the same monitoring event (i.e. a single PPV and IPC value for 3 blast patterns). The data was screened to remove all redundant data points (such as replicate readings).

3- Results, Discussion and Conclusions

2016 PPV and IPC blast monitoring results are presented in Table 1. In 2016, 276 blasts were monitored. In 2016, none PPV concentrations exceeded the DFO limit of 13 mm/s. The number of PPV exceedances has decreased significantly since 2013. In 2013, 2014 and 2015 the number of exceedances recorded were 16, 8 and 2, respectively. IPC measurements were all below the DFO limit of 50 kpa. The blast monitoring results are reviewed after each blast and the blast mitigation plan was implemented immediately if the vibrations or the overpressure exceed the guidelines. This plan includes a retroactive analysis to determine what caused the higher than expected results.

In 2016, the average PPV was 1.18 (CI +/- 0.20) with a maximum of 9.54 (maximum in 2015, 2014 and 2013 were 16.5, 23.8 and 32.7 mm/s respectively). The average in 2016 was lower than 2015 (2.38 mm/s), 2014 (3.93 mm/s) and 2013 (5.39 mm/s) averages. This difference can be explained by the fact that mining ceased at Goose Pit in April 2015. Goose Pit was the closest pit to blast monitoring stations. As there were less blasts occurring in this area, the probability of exceeding the DFO guidelines was reduced. Also, blasting activities at Portage Pit and Vault Pit were conducted deeper this year reducing vibrations recorded at the monitoring station. The upper 95% confidence limit for all of the annual data was 4.53 mm/s.

As discussed in the 2011 monitoring report, Wright (1982)¹ determined that peak particle velocity greater than 13 mm/s is potentially damaging to incubating eggs, however Faulkner et al. (2006)² found no effects on lake trout eggs due to blasts at Diavik Mine, NWT with maximum PPVs of 28.5 mm/s (16.5 at Meadowbank in 2015). Faulkner et al. (2006) measured mean PPV at three exposure stations from September to July, 2003-2004 and found a mean range of 5.8 - 6.4 mm/s (1.18 mm/s at Meadowbank in 2016) and reported 80 exceedances (0 at Meadowbank in 2016) of 13 mm/s PPV at these stations with a maximum PPV being double the DFO guideline. They found there were no differences in mortality of lake trout eggs in incubators between exposure sites and reference sites that resulted from blasting at Diavik in 2003-2004. As a result, Agnico suggests that additional studies may not be necessary to confirm low PPV at spawning and incubation sites, since results of this study suggest impacts are likely not occurring even if no attenuation of PPV is occurring between blast monitoring sites and spawning habitat.

In 2015, monitoring of habitat compensation features (i.e. dike faces) was conducted by Agnico in Second Portage Lake. Angling (16h) and underwater camera (28h) techniques were used along the East Dike and the Second Portage Lake reference station to establish fish presence. Fishing effort was approximately equal between Second Portage Lake stations and totaled 18h. In total, 13 lake trout were caught at the station (ED-4) nearest to peak particle velocity exceedances recorded in 2015 (i.e. South Portage Pit blast monitoring station) (See 2015 Blast Monitoring Report in Appendix G6 of the 2015 Annual Report). The location of station ED-4 is illustrated on Figure 1. In comparison, 16 lake trout were caught at the Second Portage Lake reference station. Two (2) and three (3) lake trout were captured by underwater camera video at ED-4 and Second Portage Lake Reference Area, respectively.

¹ Wright, D.G. 1982. A Discussion Paper on the Effects of Explosives on Fish and Marine Mammals in the Waters of the Northwest Territories. Canadian Technical Report of Fisheries and Aquatic Sciences 1052.

² Faulkner, Sean G., Tonn, William, Welz, Marek, Welz, and Schmitt, Douglas. 2006. Effects of Explosives on Incubating Lake Trout Eggs in the Canadian Arctic. North American Journal of Fisheries Management. 26:833-842.

This indicates that fish use of habitat near recorded exceedances in 2015 is not reduced compared to reference stations. Although the fish use monitoring doesn't coincide with the blast exceedances, it demonstrates no avoidance of the habitat closest to Agnico's main operations. In 2017, Agnico will complete new habitat compensation feature of dikes faces in Second Portage Lake. A comparison of the 2017 blast and habitat compensation result will permit to confirm the previous affirmation and fish use pattern.

Table 1 - 2016 PPV and IPC blast monitoring results

Date	Station	Blast Pattern	Peak Particulate Velocity (mm/s)	Peak Sound Pressure (kpa)	(sec)
<i>DFO Limit</i>			13	50	
03-01-2016	Portage Pit South	5011603-1	0	0	0
04-01-2016	Vault Pit Station #2	5095813-1	3.67	0.0075	2.144
06-01-2016	Vault Pit Station #2	5116866-2	0	0	0
07-01-2016	Portage Pit South	5004PS609-1	3.68	0.194	1.021
10-01-2016	Portage Pit South	5123657-1	0	0	0
10-01-2016	Vault Pit Station #2	5095819-1	0	0	0
15-01-2016	Portage Pit South	5123FM653-1	1.31	0.00125	4.722
16-01-2016	Vault Pit Station #2	5088PS876-1	2.02	0.009	3.343
17-01-2016	Portage Pit South	5011609-1	6.73	0.00075	0.042
17-01-2016	Portage Pit South	5123FM653-2	0	0	0
19-01-2016	Vault Pit Station #2	5095815-1	0	0	0
20-01-2016	Vault Pit Station #2	5102868-2	0	0	0
20-01-2016	Portage Pit North	5102332-1	1.57	0.024	1.764
23-01-2016	Vault Pit Station #2	5102878-1	1.18	0.00075	0.117
24-01-2016	Vault Pit Station #2	5109855-1	0	0	0
24-01-2016	Vault Pit Station #2	5102864-1	0	0	0
26-01-2016	Vault Pit Station #2	5109855-2	0	0	0
26-01-2016	Portage Pit North	5088PS333-1	0	0	0
27-01-2016	Portage Pit North	5088PS333-2	0	0	0
27-01-2016	Vault Pit Station #2	5088800-1	0	0	0
28-01-2016	Vault Pit Station #2	5088800-2	0	0	0
29-01-2016	Vault Pit Station #2	5102880-1	0	0	0
29-01-2016	Portage Pit South	5123FM655-1	0	0	0
31-01-2016	Vault Pit Station #2	5088802-1	1.51	0.0108	1.334
01-02-2016	Vault Pit Station #2	5095817-1	0	0	0
02-02-2016	Portage Pit North	5095333-1	0	0	0
05-02-2016	Portage Pit South	5123POP651-1	0	0	0
05-02-2016	Vault Pit Station #2	5088804-1	0	0	0
06-02-2016	Vault Pit Station #2	5088PS884-1	1.49	0.034	3.473
07-02-2016	Portage Pit South	5109PS650-2	0	0	0
08-02-2016	Vault Pit Station #2	5088808-1	1.69	0.00625	5.023
08-02-2016	Vault Pit Station #2	5102884-1	0	0	0
09-02-2016	Vault Pit Station #2	5102880-2	0	0	0
13-02-2016	Vault Pit Station #2	5109881-3	0	0	0
13-02-2016	Vault Pit Station #2	5088814-1	2.25	0.00625	4.137



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13-02-2016	Vault Pit Station #2	5088806-1	0	0	0
14-02-2016	Portage Pit South	5116650-1	0	0	0
17-02-2016	Portage Pit South	5116652-1	0	0	0
18-02-2016	Vault Pit Station #2	5088850-1	0	0	0
19-02-2016	Vault Pit Station #2	5095825-1	0	0	0
19-02-2016	Vault Pit Station #2	5102880-4	0	0	0
22-02-2016	Portage Pit South	5004600-1	5.004	0.0538	4.82
23-02-2016	Vault Pit Station #2	5088816-1	0	0	0
24-02-2016	Vault Pit Station #2	5088PS874-1	0	0	0
25-02-2016	Portage Pit North	5088340-1	1.28	0.0085	3.764
27-02-2016	Vault Pit Station #2	5130826-1	1.28	0.0085	3.764
01-03-2016	Vault Pit Station #2	5102874-1	0	0	0
02-03-2016	Vault Pit Station #2	5088PS886-2	0	0	0
02-03-2016	Portage Pit South	5004606-1	7.01	0.0113	2.049
04-03-2016	Portage Pit South	5004602-1	6.19	0.014	1.883
05-03-2016	Vault Pit Station #2	5095821-1	0	0	0
05-03-2016	Vault Pit Station #2	5109PS859-1	2.62	0.0015	0.263
06-03-2016	Portage Pit South	5126662-1	1.67	0.009	3.673
07-03-2016	Vault Pit Station #2	5088PS886-3	0	0	0
07-03-2016	Portage Pit South	5004608-1	3.08	0.0173	2.404
08-03-2016	Vault Pit Station #2	5123FM851-1	3.33	0.0118	1.368
10-03-2016	Vault Pit Station #2	5067PS807-1	2.42	0.0255	2.381
11-03-2016	Portage Pit South	5126664-1	0	0	0
12-03-2016	Vault Pit Station #2	5088820-1	0	0	0
13-03-2016	Vault Pit Station #2	5102886-1	0	0	0
13-03-2016	Vault Pit Station #2	5067PS807-2	0	0	0
14-03-2016	Vault Pit Station #2	5081801-1	7.48	0.0015	5.694
15-03-2016	Vault Pit Station #2	5095823-1	0	0	0
15-03-2016	Vault Pit Station #2	5102FM854 -2	0	0	0
17-03-2016	Vault Pit Station #2	5081803-1	0	0	0
19-03-2016	Vault Pit Station #2	5116876-1	0	0	0
20-03-2016	Portage Pit North	5067PS343-1	1.57	0.0225	1.943
20-03-2016	Portage Pit North	5046POP300-1	1.943	0.0225	1.57
21-03-2016	Vault Pit Station #2	5102888-1	0	0	0
23-03-2016	Vault Pit Station #2	5081805-1	6.68	0.0475	2.339
24-03-2016	Vault Pit Station #2	5128POP800-1	0	0	0
26-03-2016	Portage Pit North	5081341-1	0	0	0
27-03-2016	Portage Pit South	5123659-1	0	0	0
28-03-2016	Vault Pit Station #2	5088822-1	3.74	0.0245	2.576
30-03-2016	Vault Pit Station #2	5095855-1	1.31	0.028	2.391
31-03-2016	Vault Pit Station #2	5067PS811-1	2.09	0.0508	2.691
31-03-2016	Goose Pit	5123671-1	0	0	0
04-04-2016	Portage Pit South	5067PS341-1	1.32	0.17	1.711
04-04-2016	Vault Pit Station #2	5081809-1	0	0	0
05-04-2016	Vault Pit Station #2	5109883-1	0	0	0
08-04-2016	Vault Pit Station #2	5102894-1	0	0	0



09-04-2016	Portage Pit North	5081343-1	0	0	0
11-04-2016	Portage Pit South	5109PS654-1	1.4	0.113	2.193
11-04-2016	Vault Pit Station #2	5081807-1	0	0	0
12-04-2016	Vault Pit Station #2	5088854-1	0	0	0
14-04-2016	Vault Pit Station #2	5088856-1	0	0	0
15-04-2016	Vault Pit Station #2	5088PS898-1	2.1	0.0153	3.795
16-04-2016	Vault Pit Station #2	5088858-1	0	0	0
17-04-2016	Portage Pit South	5116654-1	1.31	0.0135	0.177
18-04-2016	Vault Pit Station #2	5081813-1	0	0	0
19-04-2016	Vault Pit Station #2	5081811-1	0	0	0
23-04-2016	Vault Pit Station #2	5088810-1	0	0	0
25-04-2016	Portage Pit North	5074340-1	1.39	0.00475	3.134
26-04-2016	Vault Pit Station #2	5088812-1	0	0	0
27-04-2016	Vault Pit Station #2	5102898-2	0	0	0
29-04-2016	Vault Pit Station #2	5088870-1	0	0	0
29-04-2016	Portage Pit North	5074342-1	1.2	0.0145	1.162
30-04-2016	Vault Pit Station #2	5088860-1	0	0	0
30-04-2016	Vault Pit Station #2	5074800-1	1.08	0.0108	5.43
02-05-2016	Portage Pit North	5074344-1	2.2	0.019	1.778
02-05-2016	Vault Pit Station #2	5095857-1	0	0	0
03-05-2016	Vault Pit Station #2	5074802-1	1.26	0.0105	1.127
05-05-2016	Vault Pit Station #2	5095827-1	0	0	0
07-05-2016	Vault Pit Station #2	5067PS811-2	2	0.0183	2.688
09-05-2016	Vault Pit Station #2	5074804-1	0	0	0
10-05-2016	Vault Pit Station #2	5095859-1	0	0	0
11-05-2016	Vault Pit Station #2	5081827-1	0	0	0
13-05-2016	Vault Pit Station #2	5074806-1	1.53	0.00325	2.355
14-05-2016	Vault Pit Station #2	5081819-1	0	0	0
14-05-2016	Portage Pit South	5116POP650-1	0	0	0
16-05-2016	Portage Pit South	5088876-1	1.31	0.00875	2.754
19-05-2016	Portage Pit South	5109651-1	1.98	0.0393	2.088
19-05-2016	Portage Pit South	5109POP651-1	0	0	0
21-05-2016	Vault Pit Station #2	5088878-1	0	0	0
22-05-2016	Vault Pit Station #2	5081821-1	0	0	0
22-05-2016	Vault Pit Station #2	5067PS817-2	1.55	0.018	3.097
24-05-2016	Vault Pit Station #2	5088880-1	1.11	0.00375	0.086
25-05-2016	Portage Pit South	5109653-1	0	0	0
27-05-2016	Vault Pit Station #2	5088882-1	0	0	0
29-05-2016	Vault Pit Station #2	5081817-1	0	0	0
31-05-2016	Vault Pit Station #2	5074810-1	0	0	0
01-06-2016	Portage Pit North	5067341-1	0	0	0
02-06-2016	Vault Pit Station #2	5088860-2	0	0	0
05-06-2016	Portage Pit North	5067343-1	1.37	0.01	2.992
06-06-2016	Vault Pit Station #2	5088862-1	0	0	0
08-06-2016	Vault Pit Station #2	5088884-1	0	0	0
10-06-2016	Vault Pit Station #2	5074808-1	0	0	0



11-06-2016	Portage Pit North	5067345-1	0	0	0
14-06-2016	Vault Pit Station #2	5067801-1	1.91	0.025	2.864
17-06-2016	Vault Pit Station #2	5081829-1	0	0	0
18-06-2016	Vault Pit Station #2	5067PS827-2	1.14	0.0005	0.01
20-06-2016	Vault Pit Station #2	5067803-1	0	0	0
24-06-2016	Vault Pit Station #2	5067805-1	0	0	0
24-06-2016	Vault Pit Station #2	5088874-1	0	0	0
29-06-2016	Vault Pit Station #2	5074850-1	2.55	0.00675	4.285
30-06-2016	Vault Pit Station #2	5081831-1	1.66	0.003	2.924
04-07-2016	Vault Pit Station #2	5074814-1	0	0	0
05-07-2016	Vault Pit Station #2	5074852-1	1.77	0.00225	2.666
08-07-2016	Vault Pit Station #2	5067PS833-3	2.12	0.017	4.207
09-07-2016	Vault Pit Station #2	5074816-1	3.48	0.00275	3.524
10-07-2016	Vault Pit Station #2	5067PS833-4	0	0	0
11-07-2016	Vault Pit Station #2	5074858-1	0	0	0
12-07-2016	Vault Pit Station #2	5088886-1	0	0	0
12-07-2016	Portage Pit North	5046PS342-1	2.89	0.0333	1.871
13-07-2016	Portage Pit North	5046PS342-2	2.06	0.01	1.857
14-07-2016	Portage Pit North	5046PS342-4	2.09	0.039	2.007
14-07-2016	Portage Pit North	5046PS342-3	2.91	0.0243	2.095
14-07-2016	Vault Pit Station #2	5074818-1	0	0	0
15-07-2016	Vault Pit Station #2	5074860-1	0	0	0
15-07-2016	Portage Pit North	5046PS342-5	0	0	0
17-07-2016	Portage Pit North	5046PS340-2	4.23	0.081	1.811
18-07-2016	Vault Pit Station #2	5081833-1	0	0	0
19-07-2016	Vault Pit Station #2	5081851-1	9.54	0.00175	1.583
19-07-2016	Portage Pit North	5046PS344-3	1.73	0.038	2.125
22-07-2016	Vault Pit Station #2	5074812-1	0	0	0
22-07-2016	Vault Pit Station #2	5067PS862-1	0	0	0
23-07-2016	Vault Pit Station #2	5067PS862-2	0	0	0
23-07-2016	Portage Pit North	5046PS340-4	4.84	0.0233	2.763
24-07-2016	Vault Pit Station #2	5067PS862-3	0	0	0
25-07-2016	Vault Pit Station #2	5067PS862-4	0	0	0
25-07-2016	Portage Pit North	5060344-1	2.85	0.0045	1.712
28-07-2016	Vault Pit Station #2	5074854-1	2.13	0.00725	5.21
30-07-2016	Vault Pit Station #2	5060SU800-1	2.64	0.004	2.23
30-07-2016	Portage Pit North	5060342-1	3.42	0.00575	5.55
31-07-2016	Vault Pit Station #2	5067PS856-2	1.33	0.0288	4.201
01-08-2016	Vault Pit Station #2	5074862-1	3.16	0.0095	7.905
01-08-2016	Vault Pit Station #2	5067PS862-5	1.33	0.0288	4.201
02-08-2016	Vault Pit Station #2	5060340-1	1.93	0.0345	2.247
03-08-2016	Vault Pit Station #2	5074SU820-1	0	0	0
03-08-2016	Vault Pit Station #2	5067PS864-1	1.94	0.00125	0.86
04-08-2016	Vault Pit Station #2	5067PS864-2	1.09	0.004	0.62
04-08-2016	Vault Pit Station #2	5074856-1	1.81	0.0833	1.799
05-08-2016	Vault Pit Station #2	5067PS870-1	0	0	0



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06-08-2016	Vault Pit Station #2	5067PS870-2	0	0	0
08-08-2016	Vault Pit Station #2	5067PS870-3	0	0	0
09-08-2016	Vault Pit Station #2	5067PS870-4	5.03	0.0015	3.869
10-08-2016	Vault Pit Station #2	5067PS853-2	0	0	0
11-08-2016	Vault Pit Station #2	5074820-1	2.91	0.003	5.542
11-08-2016	Vault Pit Station #2	5067PS853-3	0	0	0
12-08-2016	Vault Pit Station #2	5074866-1	2.46	0.00525	3.681
12-08-2016	Vault Pit Station #2	5067PS853-4	1.19	0.0143	3.865
16-08-2016	Vault Pit Station #2	5074822-1	1.82	0.0188	5.638
16-08-2016	Vault Pit Station #2	5074RA800-1	0	0	0
17-08-2016	Vault Pit Station #2	5067811-1	2.65	0.0035	2.221
21-08-2016	Vault Pit Station #2	5074870-1	2.09	0.004	3.618
23-08-2016	Vault Pit Station #2	5067SU817-1	1.65	0.019	2.493
24-08-2016	Vault Pit Station #2	5074872-1	1.54	0.00375	5.92
26-08-2016	Vault Pit Station #2	5046PS802-1	8.53	0.016	5.453
27-08-2016	Vault Pit Station #2	5067813-1	3.99	0.0095	3.957
02-09-2016	Vault Pit Station #2	5067815-1	2.73	0.0035	2.16
02-09-2016	Vault Pit Station #2	5046PS802-3	0	0	0
03-09-2016	Vault Pit Station #2	5046PS802-4	5.65	0.00356	0
06-09-2016	Vault Pit Station #2	5053341-1	2.81	0.0125	3.227
07-09-2016	Vault Pit Station #2	5067817-1	1.91	0.003	2.517
10-09-2016	Vault Pit Station #2	5053343-1	3.35	0.0108	2.975
13-09-2016	Vault Pit Station #2	5074824-1	1.05	0.0133	0.984
16-09-2016	Vault Pit Station #2	5053FM305-1	3.21	0.0433	1.978
15-09-2016	Vault Pit Station #2	5060850-1	2.83	0.0218	6.782
18-09-2016	Vault Pit Station #2	5074868-1	0	0	0
20-09-2016	Vault Pit Station #2	5067853-1	0	0	0
24-09-2016	Vault Pit Station #2	5067857-1	3.9	0.0065	3.736
26-09-2016	Vault Pit Station #2	5067819-1	2.02	0.0035	3.863
28-09-2016	Vault Pit Station #2	5067SU821-1	0	0	0
28-09-2016	Vault Pit Station #2	5046PS804-1	1.97	0.0242	1.053
30-09-2016	Vault Pit Station #2	5046PS804-2	2.34	0.0183	2.553
01-10-2016	Vault Pit Station #2	5060856-2	1.71	0.003	0.768
01-10-2016	Vault Pit Station #2	5046PS804-3	3.75	0.021	2.844
01-10-2016	Vault Pit Station #2	5046PS806-1	0	0	0
02-10-2016	Vault Pit Station #2	5060800-1	0	0	0
02-10-2016	Portage Pit South	5046340-1	0	0	0
04-10-2016	Vault Pit Station #2	5046PS804-4	0	0	0
05-10-2016	Vault Pit Station #2	5025PS630-1	0	0	0
06-10-2016	Portage Pit North	5046342-1	2.66	0.0245	0.897
06-10-2016	Vault Pit Station #2	5060800-2	1.92	0.00225	2.498
07-10-2016	Vault Pit Station #2	5032630-1	2.43	0.0125	2.016
11-10-2016	Portage Pit South	5046344-1	2.84	0.00675	4.048
12-10-2016	Vault Pit Station #2	5067821-1	2.84	0.00675	4.048
15-10-2016	Portage Pit South	5046344-2	1.56	0.00575	1.582
16-10-2016	Vault Pit Station #2	5060806-1	1.92	0.00625	4.991



17-10-2016	Vault Pit Station #2	5046PS860-2	0	0	0
17-10-2016	Portage Pit South	5004610-1	2.21	0.0075	2.237
19-10-2016	Vault Pit Station #2	5046PS860-3	0	0	0
20-10-2016	Vault Pit Station #2	5046PS860-4	0	0	0
25-10-2016	Vault Pit Station #2	5060854-1	1.49	0.007	3.519
25-10-2016	Vault Pit Station #2	5060802-1	1.15	0.0025	2.032
29-10-2016	Vault Pit Station #2	5060804-1	1.92	0.0135	2.377
30-10-2016	Vault Pit Station #2	5060860-1	0	0	0
31-10-2016	Vault Pit Station #2	5067823-1	0	0	0
20-10-2016	Portage Pit South	5032624-1	0	0	0
21-10-2016	Portage Pit North	5032PS341-1	0	0	0
22-10-2016	Portage Pit North	5046346-1	2.25	0.0225	1.959
23-10-2016	Portage Pit North	5032PS341-3	0	0	0
25-10-2016	Vault Pit Station #2	5060854-1	1.49	0.007	3.519
25-10-2016	Vault Pit Station #2	5060802-1	1.15	0.0025	2.032
26-10-2016	Portage Pit North	5032PS343-1	5.01	0.0418	1.581
29-10-2016	Vault Pit Station #2	5060804-1	1.92	0.0135	2.377
30-10-2016	Vault Pit Station #2	5060860-1	0	0	0
30-10-2016	Portage Pit North	5032PS343-2	1.57	0.076	2.175
31-10-2016	Vault Pit Station #2	5067823-1	0	0	0
31-10-2016	Portage Pit North	5032PS343-3	0	0	0
31-10-2016	Portage Pit North	5032PS343-4	4.42	0.00575	1.845
01-11-2016	Portage Pit North	5032PS343-5	5.01	0.0418	1.581
01-11-2016	Vault Pit Station #2	5060858-1	0	0	0
05-11-2016	Vault Pit Station #2	5046PS862-2	1.11	0.00075	0.03
06-11-2016	Portage Pit North	5039RA341-2	2.93	0.0163	3.472
08-11-2016	Vault Pit Station #2	5067861-1	0	0	0
08-11-2016	Vault Pit Station #2	5060808-1	0	0	0
11-11-2016	Portage Pit North	5039343-1	0	0	0
12-11-2016	Portage Pit North	5025PS345-3	0	0	0
14-11-2016	Vault Pit Station #2	5060SU812-1	0	0	0
15-11-2016	Vault Pit Station #2	5067825-1	0	0	0
17-11-2016	Vault Pit Station #2	5053801-1	1.23	0.0035	2.472
18-11-2016	Vault Pit Station #2	5046PS866-3	0	0	0
19-11-2016	Vault Pit Station #2	5039345-1	2.71	0.027	6.566
20-11-2016	Vault Pit Station #2	5046PS866-4	1.57	0.00125	0.217
20-11-2016	Vault Pit Station #2	5053801-2	0	0	0
21-11-2016	Vault Pit Station #2	5046PS866-5	0	0	0
23-11-2016	Vault Pit Station #2	5067863-1	0	0	0
23-11-2016	Portage Pit South	5025631-1	1.54	0.022	0.1
24-11-2016	Vault Pit Station #2	5053803-1	1.47	0.002	2.153
25-11-2016	Vault Pit Station #2	5060810-1	0	0	0
27-11-2016	Portage Pit North	5025PS357-2	6.24	0.016	1.728
28-11-2016	Vault Pit Station #2	5053851-1	0	0	0
28-11-2016	Portage Pit South	5025635-1	2.28	0.00875	3.866
04-12-2016	Vault Pit Station #2	5053805-1	0	0	0



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05-12-2016	Vault Pit Station #2	5053SU809-1	0	0	0
05-12-2016	Portage Pit North	5039347-1	2.56	0.0005	2.131
06-12-2016	Vault Pit Station #2	5060866-1	0	0	0
07-12-2016	Portage Pit South	5025633-1	0	0	0
09-12-2016	Vault Pit Station #2	5046PS868-2	0	0	0
12-12-2016	Portage Pit North	5039349-1	2.06	0.00625	1.836
12-12-2016	Vault Pit Station #2	5046PS868-3	1.09	0.0385	2.232
14-12-2016	Vault Pit Station #2	5060870-1	1.43	0.00325	0.385
19-12-2016	Vault Pit Station #2	5053855-1	0	0	0
23-12-2016	Vault Pit Station #2	5053809-1	0	0	0
25-12-2016	Vault Pit Station #2	5060812-1	0	0	0