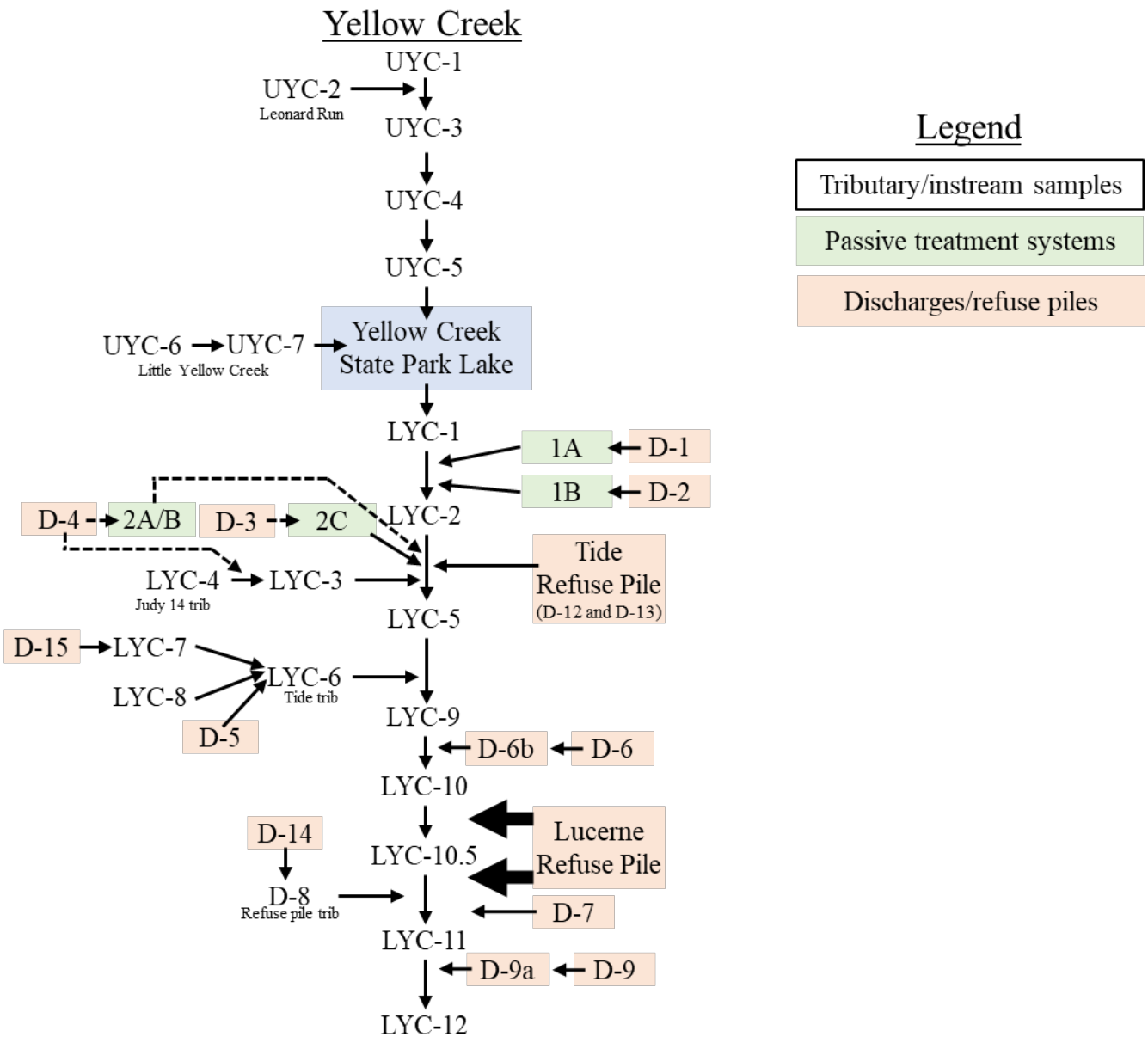
Yellow Creek Watershed Assessment

January 2022

Appendix 1: Yellow Creek sampling schematic



Appendix 1. Sampling points and conceptual flowpaths for the Yellow Creek Watershed. Every text box is a sampling location in this study. Yellow Creek State Park Lake is highlighted in blue as the distinction between upper Yellow Creek (UYC) and lower Yellow Creek (LYC). Discharges are highlighted in orange, treatment systems are highlighted in green, and tributary/instream samples have no highlighting. Dashed arrows indicate multiple flow paths are possible.

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Appendix 2: Lower Yellow Creek fish survey

Conducted in July 2020 by the Conemaugh Valley Conservancy's Stream Team

Fish Assessment of Two Lick Creek and Yellow Creek Watersheds:

Introduction

Two Lick Creek is a stream located in Indiana County that is the largest tributary of Blacklick Creek at roughly 190 sq. mi., who begins its course in Green Township and heads west and southward to its mouth in Josephine before entering Blacklick Creek. The stream's largest tributary is the Yellow Creek watershed. The primary land uses are forest, agriculture, urban areas, and residential areas, with forest and agriculture comprising the majority of land cover at roughly more than 80% of the land cover (1). The watershed comprises several developed areas including the cities of Indiana, Clymer, and Homer City. The Two Lick Creek watershed supports a variety of sports fishing species including Brown Trout, Rainbow Trout, Brook Trout, Smallmouth Bass, Largemouth Bass, and Yellow Perch. Abandoned mine drainage (AMD) is a leading impairment of streams in the watershed with notable discharges including Richard's, Penn Hills, Risinger, Yellow Creek discharges, Lucerne discharges, and more (2). Fish serve as important indicators for long-term water quality monitoring, due to their continued presence in water and their sensitivity to pollution and habitat degradation. Thus, an index of biotic integrity based on the Ohio EPA protocol can be used to assess stream health and determine impacts to a watershed using fish (3).

The Richard's treatment system has reached its life span and is to be rehabilitated in 2020. Determining the effects of the Richard's discharge on fish and macroinvertebrate communities in Two Lick Creek is currently unknown and needed to assess the restoration impact of the Richard's treatment system. Secondly, an assessment on the impacts of AMD beginning near Route 954 is needed to restore the water quality and stream health on Yellow Creek. Lastly, baseline data of fish is needed to assess the state of the Two Lick Creek watershed and provide above/below impacts from main sources of AMD discharges (Richard's, Penn Hills, Risinger/Yellow Creek). Thus, the purpose of these surveys were to assess the impact of the Richard's discharge on Two Lick Creek, the impact of AMD on lower Yellow Creek, and to provide baseline fish data for Two Lick Creek.

Methodology

<u>Water Chemistry</u>

A multimeter was used to take pH, conductivity, and temperature measurements. Alkalinity was taken at sites where applicable. Additional water chemistry information was pulled from previous water sample analyses including Hedin Environmental's Yellow Creek sampling.

<u>Fish Survey</u>

Fish Surveys were completed on a 100 meter section of stream using a Smith-Root LP-24 electroshocker backpack. Surveys were completed in July of 2020. Shocking time ranged from 20-70 minutes and shocking voltage dependent on for each stream. Fish were identified in the field. An index of biotic integrity was completed according to the Ohio EPA's fish IBI protocol.

Macroinvertebrate Survey

A macroinvertebrate survey was completed by measuring a 100 meter distance using a dipnet. Surveys were completed in April of 2020. Twenty kicks were completed over the survey distance. Kicks consisted of twenty seconds of constant kicking in a 1 square meter area upstream from the dipnet. After collection, large debris was washed clean of any invertebrates and removed. The remaining material was collected within a 500 mL container and filled with 90% isopropyl ethanol for preservation. A subsample was identified from the collected material using a 24 gridded pan with a random number generator to search a square until 200 individuals are identified. An index of biotic integrity was completed according to the DEP's analysis protocol (4). A macroinvertebrate survey was completed above and below the Richard's treatment system.

Results

Two Lick Creek

Two Lick Creek above the Richard's Treatment System had a fish IBI score of 46 and a macroinvertebrate IBI score of 71.82, meeting the definition of a warmwater fishery and the classification of a trout stocked fishery. Wild Brown Trout were present in the stream, thus, meeting the definition for a trout stocked fishery classification. Based upon a simple visual assessment, habitat appeared quite abundant with plenty of unembedded cobble and boulders, a good frequency of pools, riffles, and runs, snags, undercut banks, and sand/gravel. The field water chemistry measurements had a pH of 8.03, temperature of 20.4°C, alkalinity of 130 mg/L, and a conductivity of 384 µS/cm^3.

Figure 1. Yellow Perch (*Perca flavescens*)

Figure 2. Johnny Darter (*Etheostoma nigrum*)

Two Lick Creek below the Richards Treatment System had a fish IBI score of 40 and a macroinvertebrate IBI score of 66.29, meeting the definition of a warmwater fishery. Brown Trout (young of the year) were present in the stream, thus, the stream meets its classification of a trout stocked fishery and indicates reproduction is occurring. A total of 15 species were collected. Mottled sculpin were the dominate species at 54% of the sample. Based upon a simple visual assessment, there appeared to be plenty of fish habitat with cobble, boulders, snags, riffles, pools, and runs. However, the stream appeared to have issues from sedimentation from the Richard's discharge and silt. The field water chemistry measurements had a pH of 7.76, temperature of 19.5°C, conductivity of 440.6 µS/cm^3, and an alkalinity of 156 mg/L.

Two Lick Creek below the Two Lick Creek Reservoir, at Waterworks Conservation Area, had a fish IBI score of 37 and meets the definition of an impaired warmwater fishery. A total of 12 species were collected. The stream possessed wild Brown Trout, indicating good water quality, thus meeting its classification of a trout stocked fishery. Mottled sculpin were the dominate species, comprising 63% of the sample. There appeared to be a lack of fish habitat, based upon a simple visual assessment, within this section. There were a few deep pools, large boulders, and some cobble present, however, it was not at a level that would be expected for this size of stream. Smallmouth bass were also present within this section and would serve as additional game fish for this area. The water chemistry had a pH of 7.2, temperature of 13.2°C, conductivity of 230 µS/cm^3, and a TDS of 115 mg/L/.

Figure 3. Wild brown trout (*Salmo trutta*)

The Two Lick Creek mouth had a fish IBI score of 44 and meets the definition of a warmwater fishery (Ohio EPA, 1987). A total of 14 species were collected. Banded darters were the dominate species, comprising 47% of the sample. The stream was comprised of 6 darter species, who comprised the majority of fish, including the logperch. No trout were found in this stretch of stream, but the stream could likely serve as a trout stocked fishery, thus meeting its stream classification. The stream, based on a simple visual assessment, has plenty of habitat for fish including cobble, gravel, pools, snags, riffles, runs, and large woody debris. The stream had visual impairments from AMD, including iron deposition and aluminum hydroxide hue. However, the water chemistry indicated good water quality with a field pH of 7.35, conductivity of 523 µS/cm^3, a temperature of 22.3°C, and an alkalinity of 52 mg/L.

Figure 4. Logperch

Yellow Creek

Yellow Creek just above Route 954 scored an IBI of 30 and meets the definition of an impaired stream. The stream had a total of six fish species collected. River chubs were the dominate fish species, comprising 57% of the sample. River Chubs are a strong indicator of a healthy stream being a pollution intolerant species, insectivorous, and simple lithophil. The stream did not have a formal habitat assessment, but a visual inspection suggests the stream has plenty of habitat with a high frequency of riffle, pool, and run habitats, unembedded boulder and cobble, gravel & sand for reproduction, snags, and undercut banks. Water chemistry had an acidity level of -31 mg/L, a pH of 7.4, alkalinity level of 37, iron level of <0.18 mg/L, aluminum level <0.3 mg/L, manganese level 0.06 mg/L, and sulfate level of 45 mg/L.

No fish were present near the mouth of Yellow Creek at Floodway Park. Based upon a simple visual assessment, there appears to be habitat for fish including boulders, cobble, gravel, sand, and woody debris. Water chemistry lab results show Yellow Creek at Floodway Park had an acidity of 9 mg/L, a pH of 6.3, alkalinity level of 13 mg/L, an iron level of 16.3 mg/L, an aluminum level of 4.0 mg/L, a manganese level of 0.7 mg/L, and a sulfate level of 192 mg/L. A macroinvertebrate survey needs to be completed, which will provide further clarification of water quality through biotic integrity analysis.

Figure 5. River Chub (*Nocomis micropogon*)

Table 3. Fish & macroinvertebrate Index of Biotic Integrity (IBI) scores of Two Lick Creek watershed sample sites

Location	Fish IBI Score	Macroinvertebrate IBI Score
Two Lick Creek Above Richard's T.S.	46	71.82
Two Lick Creek Below Richard's T.S.	40	66.29
Two Lick Creek Below Reservoir	37	N/A
Two Lick Creek Mouth	44	N/A
Yellow Creek Above Rt. 954	30	N/A
Yellow Creek Mouth (Floodway Park)	N/A (No fish present)	N/A

Analysis & Conclusion

Two Lick Creek:

Two Lick Creek Above Richards Treatment System:

Based upon the fish and macroinvertebrate IBI, Two Lick Creek above the Richard's Treatment System is attaining at a level with its designated use of a trout stocked fishery and also meets the definition of a warmwater fishery classification. Two Lick Creek may support wild trout populations as evidence by wild trout and young of the year caught in this survey downstream of the North and South Branch, thus potentially extending the range of PFBC's wild trout designation for Two Lick Creek. There is a healthy population of macrionvertebrates and fish, with several sensitive indicator species and good diversity. The stream appears to be healthy and of good water quality with water chemistry parameters in good standing, strong biotic integrity, good habitat, and little encroachment or environmental impacts.

Two Lick Creek Below Richards Treatment System:

The Richard's discharge does impact the Two Lick Creek biotic integrity, with a decrease of 6 points in the fish IBI score and 5.53 points in the macroinvertebrate IBI score compared to above the Richard's discharge. The fish community was similar in composition to that above the Richard's discharge, aside from a few species comprising a minority of the population. However, there appeared to be a decrease in species abundance across both the fish and macroinvertebrate community, with more pollution tolerant species abundance increasing. Thus, these findings further support the conclusion that the

Richard's discharge is impacting Two Lick Creek. While the stream scored lower below the Richard's discharge, Two Lick Creek is still attaining at a level that meets the definition of a warmwater fishery classification and its scoring doesn't rescind its designated use as a trout stocked fishery. Restoration of the Richard's treatment system is likely to improve the fish and macroinvertebrate communities to a level such as that above the discharge.

Two Lick Creek Below Reservoir (at Waterworks Conservation Area):

The stream fell within the impaired warmwater fishery classification based upon the fish IBI, however, it was relatively high and may have just fallen out of the attaining range. The stream appears to have a good water quality based upon field data, with an acceptable pH, low temperatures, and reasonable conductivity levels for the watershed. Despite having the greatest fish count, the location appeared to have little habitat for fish and possibly channelized based upon aerial imagery. This may explain why fewer species were found. Compared to a survey done at a similar location in 2006 by Dr. William Brenneman, four similar species were found in both surveys and five new species were discovered in our survey (2). Wild brown trout were discovered in both surveys, supporting their early findings of a resident wild trout population. A macroinvertebrate survey would help to clarify the IBI score and stream health, yet, I would recommend moving the sampling site for future samplings further downstream where more habitat may exist.

Two Lick Creek Mouth:

The stream meets the definition of a warmwater fishery, which would be expected for a stream of this size. The stream may serve as a trout stocked fishery (though no trout were found) that it would therefore not change its designated use. Abandoned mine drainage issues appear to impact the stream from upstream discharges (Yellow Creek, Risinger Discharge, and Tearing Run) with metal loading and sedimentation. A macroinvertebrate survey needs to be completed at the Two Lick Creek mouth, which will provide further clarification of water quality through biotic integrity analysis. Restoration of these AMD discharges will likely result in significant improvements on the lower Two Lick Creek watershed. The Blacklick Creek also poses issues for the lower Two Lick Creek watershed as a barrier for fish migration. Restoration in the Blacklick Creek watershed, notably with the development of the treatment plant for the 3 Sisters/Wehrum/Red Mill discharges, will also likely have significant impacts in improving the fish community of the Two Lick Creek watershed.

Yellow Creek:

Yellow Creek Above Route 954:

The high pH (>7.0), low acidity levels, low metal loadings, moderate alkalinity, and good habitat would suggest suitable habitat for many fish species. Also, the presence of intolerant species such as River Chub, who dominated the species composition, would suggest good water quality. However, the low IBI score and low diversity suggest the stream is impaired from a biotic integrity analysis. This impairment may be due to the AMD below Route 954 creating a barrier for fish to migrate upstream, thus creating a low IBI score. A macroinvertebrate survey will clarify whether the biotic integrity confirms this hypothesis or reflects the indication of impairment, as macroinvertebrates are not subjugated to migration impairments to the degree fish are.

Yellow Creek at Floodway Park:

The lack of fish is most likely due to AMD impairment, which the water quality of the stream is degraded through iron & aluminum loading, and sedimentation from precipitates. All of which are known to contribute to the absence of fish. The stream appears to support good habitat for fish that upon AMD restoration, fish would be expected to return to the stream. A macroinvertebrate survey needs to be completed, which will provide further clarification of water quality through biotic integrity analysis.

References

1. Two Lick Creek Indiana County: Water Quality Standards Review, Stream Redesignation Evaluation Report. 2016. Department of Environmental Protection.
2. Two Lick Creek Coldwater Heritage Conservation and Restoration Plan. 2005. Ken Sink Chapter of Trout Unlimited. Cold Water Heritage Partnership of Pennsylvania.
3. A Benthic Macroinvertebrate Index of Biotic Integrity for Wadeable Freestone Riffle-Run Streams in Pennsylvania. 2012. Department of Environmental Protection. Division of Water Quality Standards.
4. Biological Criteria for the Protection of Aquatic Life: Volume II: users Manual for Biological Field Assessment of Ohio Surface Waters. 1988. Environmental Protection Agency: State of Ohio. Division of Water Quality Planning & Assessment: Ecological Assessment Section.

Tables & Figures

Table 1. Fish survey results in Two Lick Creek watershed

Species	Two Lick Creek Above Richards	Two Lick Creek Below Richards	Two Lick Creek Below Reservoir	Two Lick Creek Mouth	Yellow Creek Above Rt. 954
Creek Chub	7	1	0	0	1
Blacknose Dace	1	2	11	0	0
Emerald Shiner	4	7	0	0	3
Bluntnose Minnow	1	1	4	2	0
River Chub	3	8	0	1	65
Northern Hogsucker	3	2	16	2	4
White Sucker	17	5	3	6	0
Fantail Darter	1	1	0	11	0
Blackside Darter	4	3	0	0	0
Rainbow Darter	7	11	7	5	0
Greenside Darter	1	1	0	10	3
Johnny Darter	5	0	2	7	0
Logperch	0	0	0	3	0
Banded Darter	0	0	0	50	0
Yellow Perch	2	0	0	0	0
Green Sunfish	0	0	1	3	0
Pumpkinseed	1	0	1	0	0
Bluegill	4	0	1	4	0
Smallmouth Bass	0	1	1	2	0
Yellow Bullhead	1	2	0	1	0
Brown Trout	2	1	1	0	0
Mottled Sculpin	23	54	80	0	38
Total	87	100	128	107	114

Table 2. Macroinvertebrate survey results of Two Lick Creek above and below Richard's Treatment System

Common Name	Genus	Two Lick Creek Above Richard's T.S.	Two Lick Creek Below Richard's T.S.
Non-biting midge	*Chironomidae*	44	62
Biting Midge	*Ceratopogonidae*	1	0
Black Fly	*Prosimulium*	5	10
Meniscus Midges	*Dixa*	3	3
Earthworm	*Oligochaeta*	8	14
Allegheny Crayfish	*Orconectes obscurus*	1	2
Riffle Beetle	*Macronychus glabratus*	3	0
Riffle Beetle	*Stenelmis*	3	0
Riffle Beetle	*Optioservus*	1	3
Helgrammite	*Nigronia*	1	1
Mosquito	*Aedes*	1	5
Watersnipe fly	*Atherix*	2	1
Limoniid Cranefly	*Antocha*	2	2
Flat-head Mayfly	*Maccaffertium*	49	27
Spiny Crawler Mayfly	*Eurylophella*	3	6
Burrowing Mayfly	*Ephemera*	5	2
Square-Gilled Mayfly	*Caenis*	38	12
Brush-Legged Mayfly	*Isonychia*	2	3
Small minnow mayfly	*Baetis*	3	4
Net-spinning caddisfly	*Chimarra*	1	0

Net-spinning caddisfly	*Arctopsyche*	1	0
Northern Casemaker Caddisfly	*Pycnopsyche*	7	16
Hooded casemaker caddisfly	*Molanna*	1	0
Net-spinning caddisfly	*Hydropsyche*	2	6
Net-spinning caddisfly	*Macrostemum*	1	0
Net-spinning caddisfly	*Diplectrona*	5	4
Trumpet-net caddisfly	*Neureclipsis*	1	3
Small Winter Stonefly	*Allocapnia*	1	1
Green Stonefly	*Alloperla*	3	3
Rolled-Winged Stonefly	*Leuctra*	2	1
Shore Flies	*Ephyidridae*	0	7
Gilled Aquatic Snail	*Pleurocidae*	0	1
Net-spinning caddisfly	*Cheumatopsyche*	0	1
Stripetail Stonefly	*Clioperla*	0	1

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Appendix 3: PADEP presentation on refuse pile reclamation in the Blacklick Creek watershed

Presented at 2017 annual West Virginia Mine Drainage Task Force meeting. Presentation retrieved from:

https://wvmdtaskforce.com/past-symposium-papers/2017-symposium-papers/

Reclamation of Refuse Piles using Fluidized Bed Combustion Ash in the Blacklick Creek Watershed, Pennsylvania

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Gregory Aaron, Rock Martin, and Gregory Greenfield

Questions of the Study

- How has the water quality of the drainage from the refuse piles changed in response to the removal of the refuse and the placement of fluidized bed combustion (FBC) ash?
  - Also how has the water quality of the groundwater changed?
- How have the loadings of acid mine drainage pollutants from the refuse pile drainage changed?
- How has the water quality of the receiving streams changed as the refuse piles were reclaimed?

Study Sites

- Five sites are included in the study (listed in the order that they were permitted)
  - Revloc #1 (Surface Mining Permit No. 11880201)
  - Colver (Surface Mining Permit Nos. 11900201 & 11970201)
  - Revloc #2 (Surface Mining Permit No. 11960202)
  - Nanty Glo West (Surface Mining Permit No. 11020202)
  - Nanty Glo East (Surface Mining Permit No. 11070202)

Revloc #1, Revloc #2, Nanty Glo West, and Nanty Glo East sites are operated by Ebensburg Power Company.

Colver site is operated by Maple Coal Company.

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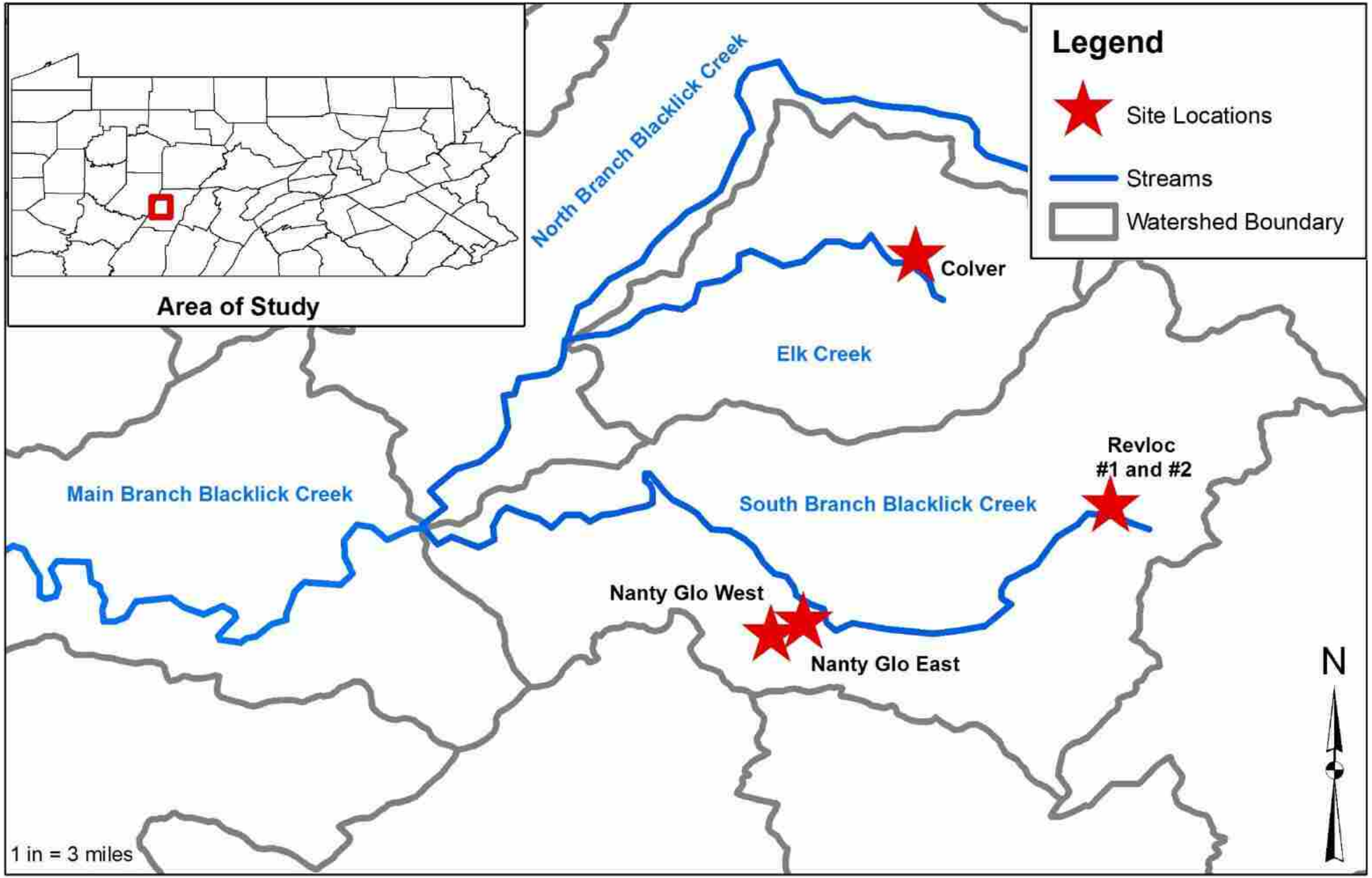


All five sites are located in Cambria County

Site Description and Permitted Activities

- All five sites are abandoned pre-SMCRA coal refuse piles that have been permitted for refuse reprocessing.
- The sources of the refuse were underground mines that were predominantly mining the Lower Kittanning coal seam.
  - Refuse is removed from the site, screened, and hauled to a nearby FBC power plant:
    - Ebensburg Power Company in Ebensburg, PA
    - Colver Power Plant in Colver, PA operated by Inter-Power/Ahl-Con Partners, L.P

Basics of Fluidized Bed Combustion

- Coal Refuse and limestone are added to the furnace forming the bed material.
  - ~20% limestone by weight
- During combustion jets of air cause the solids to be fluidized (suspended in the furnace).
- Both Ebensburg and Colver power plants utilize circulating fluidized bed (CFB) technology.
  - With a CFB, as the flue gas and suspended solids rise inside the furnace, the solids are separated and a portion is returned to the bed (i.e., recirculated).

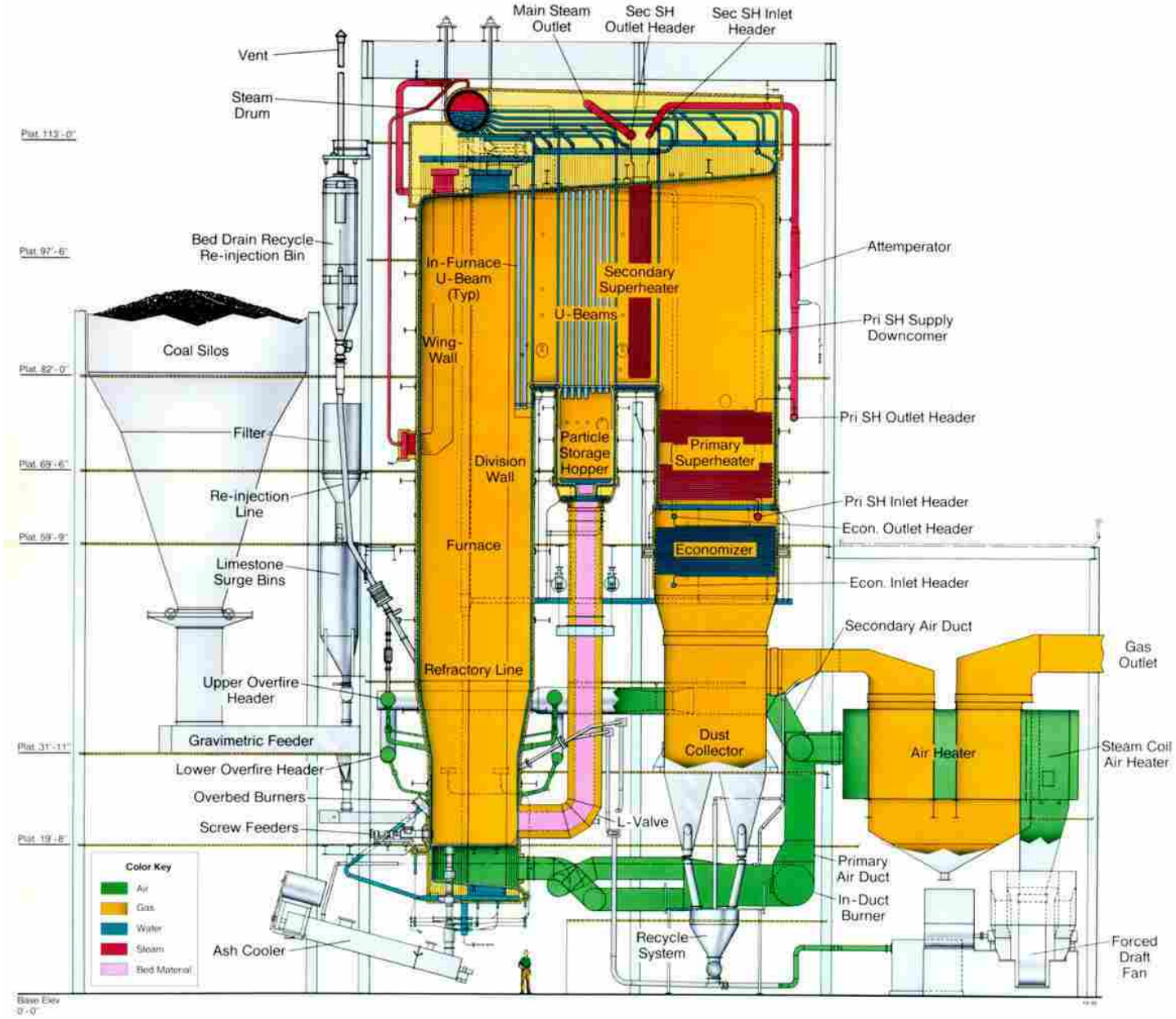


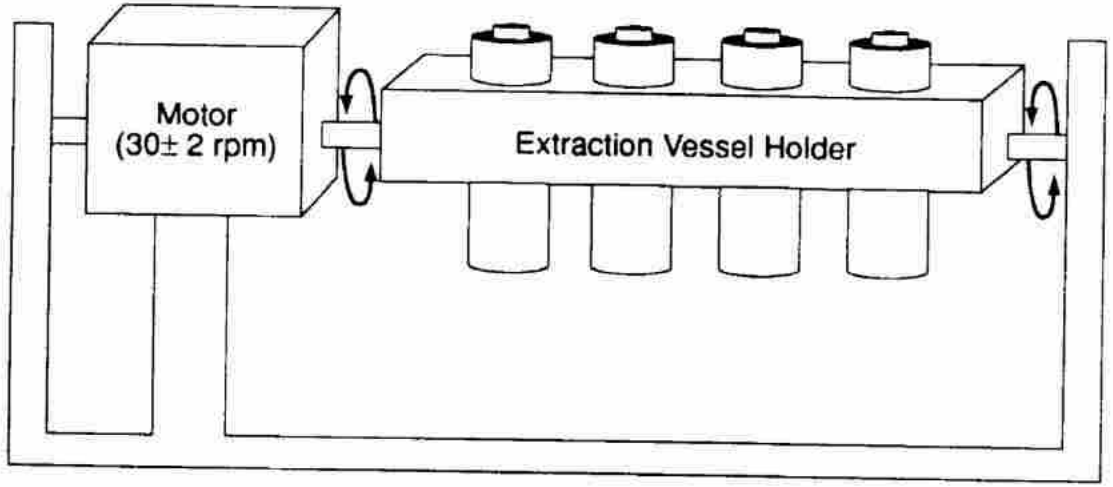
Diagram provided by Ebensburg Power Company

- FBC ash is placed on the site with the reject refuse material.
- FBC Ash has pozzolonic (cementicious) characteristics, which cause it to harden and encapsulate the refuse material

Reject refuse material being spread on top of a layer of ash
Photo from Nanty Glo West on May 7, 2010

Properties of FBC Ash

- Certification must be obtained from PADEP before FBC ash from a power plant can be placed on a site.
- The certification process involves running the Synthetic Precipitation Leachate Procedure (SPLP) on samples of fresh ash.
  - The procedure is used to determine what constituents in the ash may be mobilized once the ash comes into contact with precipitation water.



Apparatus in which the ash sample and fluid are combined in a vessel and then agitated.
Diagram from SW-846 Test Method 1312: Synthetic Precipitation Leaching Procedure Document from the Environmental Protection Agency

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Properties of FBC Ash

- Average percentage of $CaCO_3$ measured from the ash
  - Ebensburg Power Plant = 19.8%
  - Colver Power Plant = 24.7%

Average SPLP Ash Leachate Water Quality		
	Ebensburg Power Plant (45 samples total)	Colver Power Plant (52 samples total)
pH (SU)	12.09	12.41
Calcium (mg/L)	708	1,744
Chloride (mg/L)	11.4	18.8
Magnesium (mg/L)	0.60*	0.70**
Potassium (mg/L)	41.2	6.08
Sodium (mg/L)	16.9	6.73
Sulfate (mg/L)	936	1,585

* Only detected in 1 out 33 samples

** Only detected in 8 out of 35 samples

Properties of FBC Ash

- Trace element concentrations of leachate from Ebensburg Power Plant
- Barium and chromium were detected in more than 50% of the total number of samples.

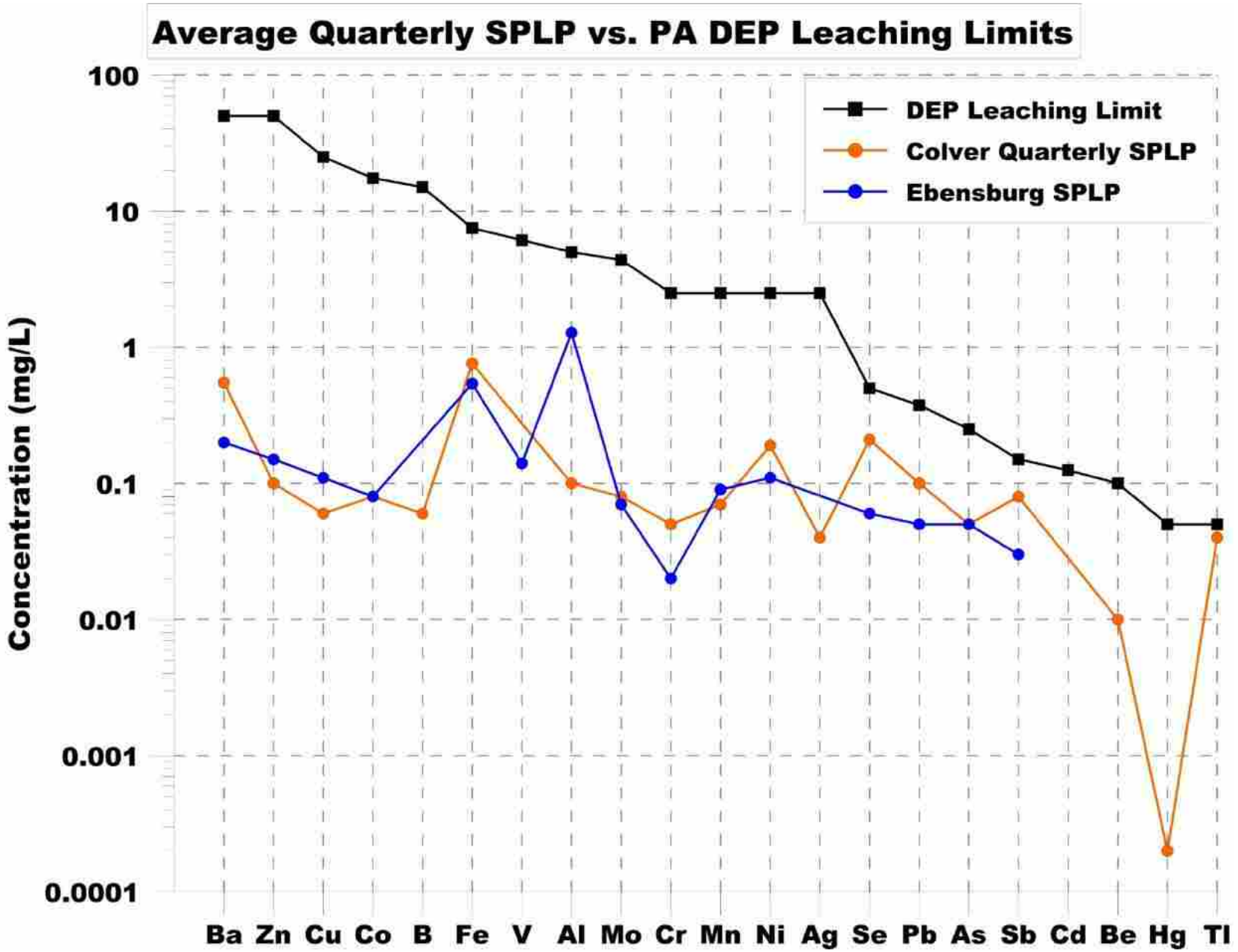
	Number of Detections	Average Concentration (mg/L)
Iron	5 out of 45 (11%)	0.54
Aluminum	9 out of 45 (20%)	1.28
Manganese	3 out of 45 (7%)	0.09
Antimony	2 out of 45 (4%)	0.03
Arsenic	1 out of 45 (2%)	0.03
Barium	39 out 45 (87%)	0.20
Beryllium	No Detections out of 33 samples	
Boron	No Detections out of 45 samples	
Cadmium	No Detections out of 45 samples	
Chromium	34 out of 45 samples (76%)	0.02
Cobalt	No Detections out of 43 samples	
Copper	3 out of 45 samples (7%)	0.11
Lead	7 out of 45 samples (16%)	0.05
Mercury	No Detections out of 45 samples	
Molybdenum	2 out of 45 samples (4%)	0.07
Nickel	1 out of 45 samples (2%)	0.11
Selenium	4 out of 45 (9%)	0.06
Silver	No Detections out of 41 samples	
Thallium	No Detections out of 33 samples	
Vanadium	2 out of 39 samples (5%)	0.14
Zinc	3 out of 45 samples (7%)	0.15

Properties of FBC Ash

- Trace element concentrations of leachate from Colver Power Plant
- Barium, chromium, and molybdenum were present in more than 50% of the total number of samples.
- Arsenic, lead, and selenium were detected in more than 30% of the total number of samples.

	Number of Detections	Average Concentration (mg/L)
Iron	4 out of 52 (8%)	0.76
Aluminum	1 out 52 (2%)	0.10
Manganese	10 out of 52 (19%)	0.07
Antimony	1 out of 52 (2%)	0.078
Arsenic	16 out of 52 (31%)	0.05
Barium	44 out of 52 (85%)	0.55
Beryllium	2 out of 44 (5%)	0.01
Boron	5 out of 52 (10%)	0.06
Cadmium	No Detections out of 52 samples	
Chromium	42 out of 52 (81%)	0.05
Cobalt	1 out of 44 (2%)	0.08
Copper	7 out of 52 (13%)	0.06
Lead	17 out of 52 (33%)	0.10
Mercury	2 out of 52 (4%)	0.0002
Molybdenum	30 out of 52 (58%)	0.08
Nickel	6 out of 52 (12%)	0.19
Selenium	22 out of 52 (42%)	0.22
Silver	4 out of 42 (10%)	0.04
Thallium	4 out of 41 (10%)	0.04
Vanadium	No Detections out of 44 samples	
Zinc	11 out of 52 (21%)	0.10

- The measured concentrations of the constituents were consistently less than the Department's leaching limits.
- The graph to the right shows the how the average measured concentrations of different constituents in the leachate compared to the leaching limit.
  - Note: The average on the graph does not include the samples that were below the detection limit.



Amount of Refuse Removed and Ash Placed

	Total Tons of Refuse Reprocessed (metric tons)	Total Tons of Ash Placed (metric tons)
Revloc #1	2,401,233	2,305,433
Revloc #2*	154,758	857,500
Nanty Glo West	1,306,945	1,294,584
Nanty Glo East	1,104,932	428,027
Colver	3,772,507	7,216,569
Total	**8,740,375**	**12,102,113**

*There were years where the tonnage data was not available for the Revloc #2 site therefore the actual total amounts may be higher

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Water Monitoring at the Sites

- Among the five study sites there are a total of 23 total discharges that were degraded by the refuse piles.
- These discharges were covered under PADEP's Subchapter F remining regulations.
  - The loadings of acidity, iron, aluminum, and manganese had to be monitored and reported on a monthly basis.
  - The permittee does not incur treatment liability for the discharge unless it is determined that the water quality was been degraded compared to its pre-mining baseline pollutional loading.
- Some of discharges were selected to be ash monitoring points.
  - In additional to the monthly subchapter F loadings a discharge sample was required to be collected and analyzed quarterly for the same constituents that are measured in the leachate testing.
- Monitoring wells were installed to evaluate the groundwater.
- *Note: All concentrations reported in this presentation are total, not dissolved.*

Revloc Refuse Piles 1989

Prior to reclamation

Refuse piles cover ~ 58 acres

Revloc
Refuse Piles
2004

During
reclamation

Revloc #1
Refuse Pile
2014

After reclamation

Revloc #2
Refuse Pile
2014

After reclamation

Revloc #1

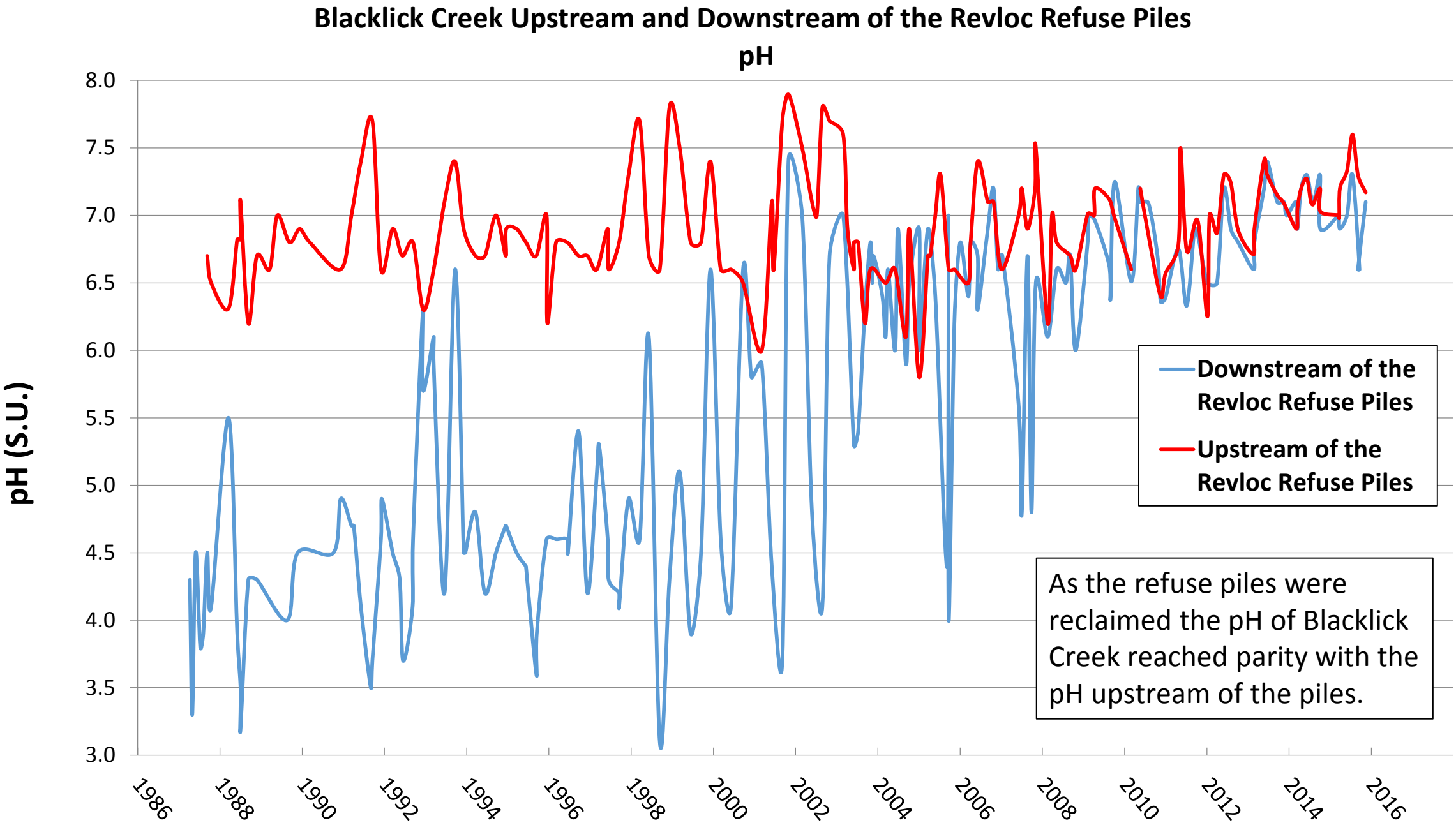
- Six discharges total
  - 2 became net alkaline
  - 4 remained acidic but with diminished pollutant loadings

	Average Baseline Loading April 1987-April 1990	Average Post-reclamation Loading January 2012-September 2016	Percent Reduction
Acidity (kg/day)	637	29.1	95
Iron (kg/day)	1.22	0.08	93
Aluminum (kg/day)	80.4	4.53	94
Manganese (kg/day)	2.55	0.68	73
Sulfate (kg/day)	692	231	67

Revloc #2

- Two discharges total
  - Both became net alkaline
  - Another small, acidic seep was later observed and added as a monitoring point.

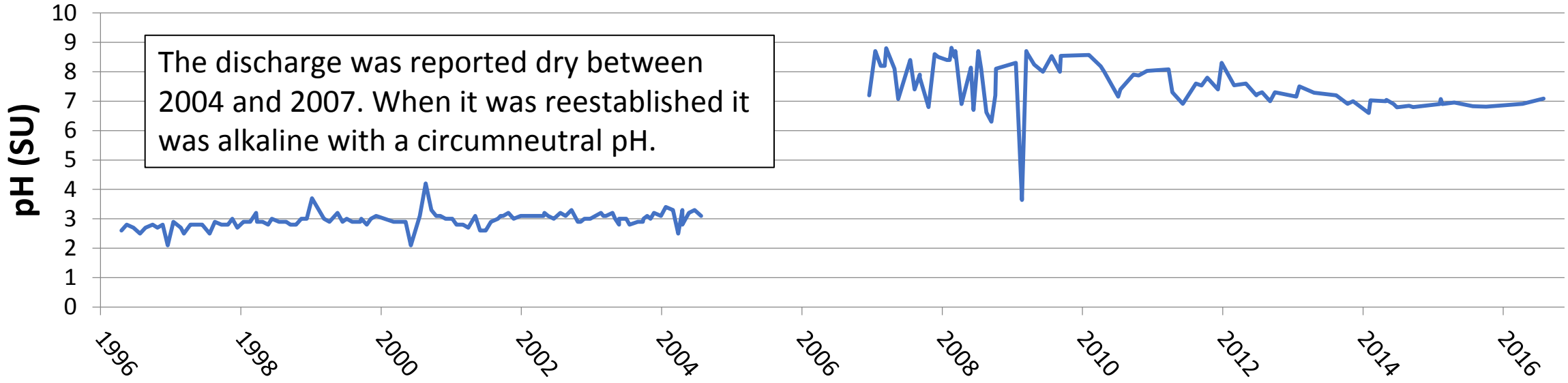
	Average Baseline Loading May 1996-July 1997	Average Post-reclamation Loading October 2012-September 2016	Percent Reduction
Acidity (kg/day)	168	9.14	95
Iron (kg/day)	3.30	0.01	99.6
Aluminum (kg/day)	28.5	0.02	99.9
Manganese (kg/day)	5.97	0.03	99.4
Sulfate (kg/day)	368	63.9	83

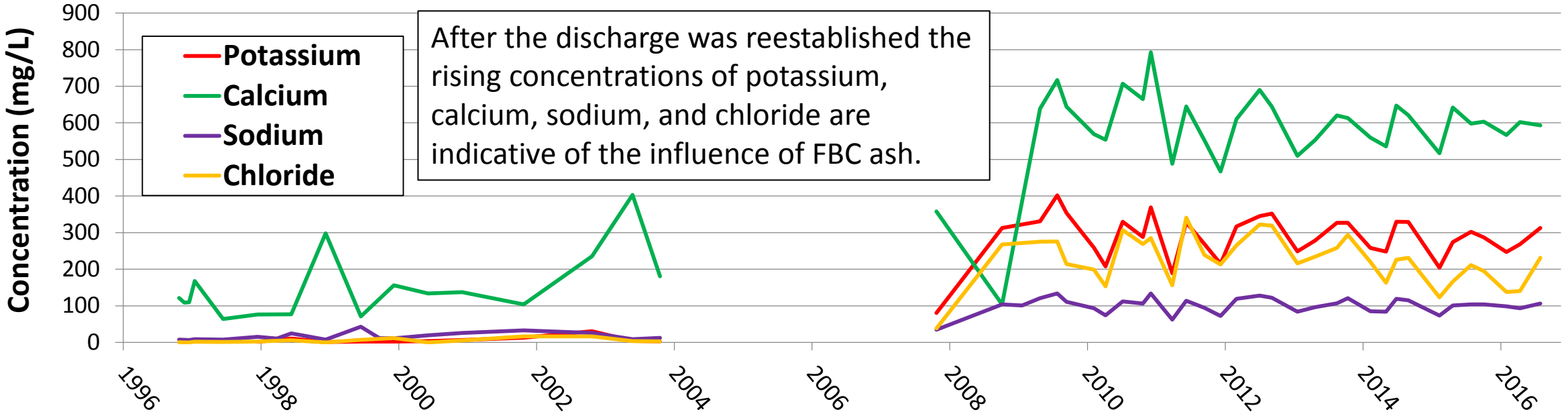

Blacklick Creek Upstream and Downstream of the Revloc Refuse Piles
pH
pH (S.U.)
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Downstream of the Revloc Refuse Piles
Upstream of the Revloc Refuse Piles
As the refuse piles were reclaimed the pH of Blacklick Creek reached parity with the pH upstream of the piles.

Ash Monitoring at the Revloc Refuse Piles

- There are five monitoring wells that are used to monitor the effects of the FBC ash placement.
- No influence from the FBC ash has been observed in any the wells.
- There has been no degradation of the baseline groundwater quality observed since reclamation began.
- Monitoring point R2A, which collects drainage from the Revloc #2 refuse pile, was also an ash monitoring point.

Monitoring Point R2A - Discharge from the Revloc #2 Refuse Pile

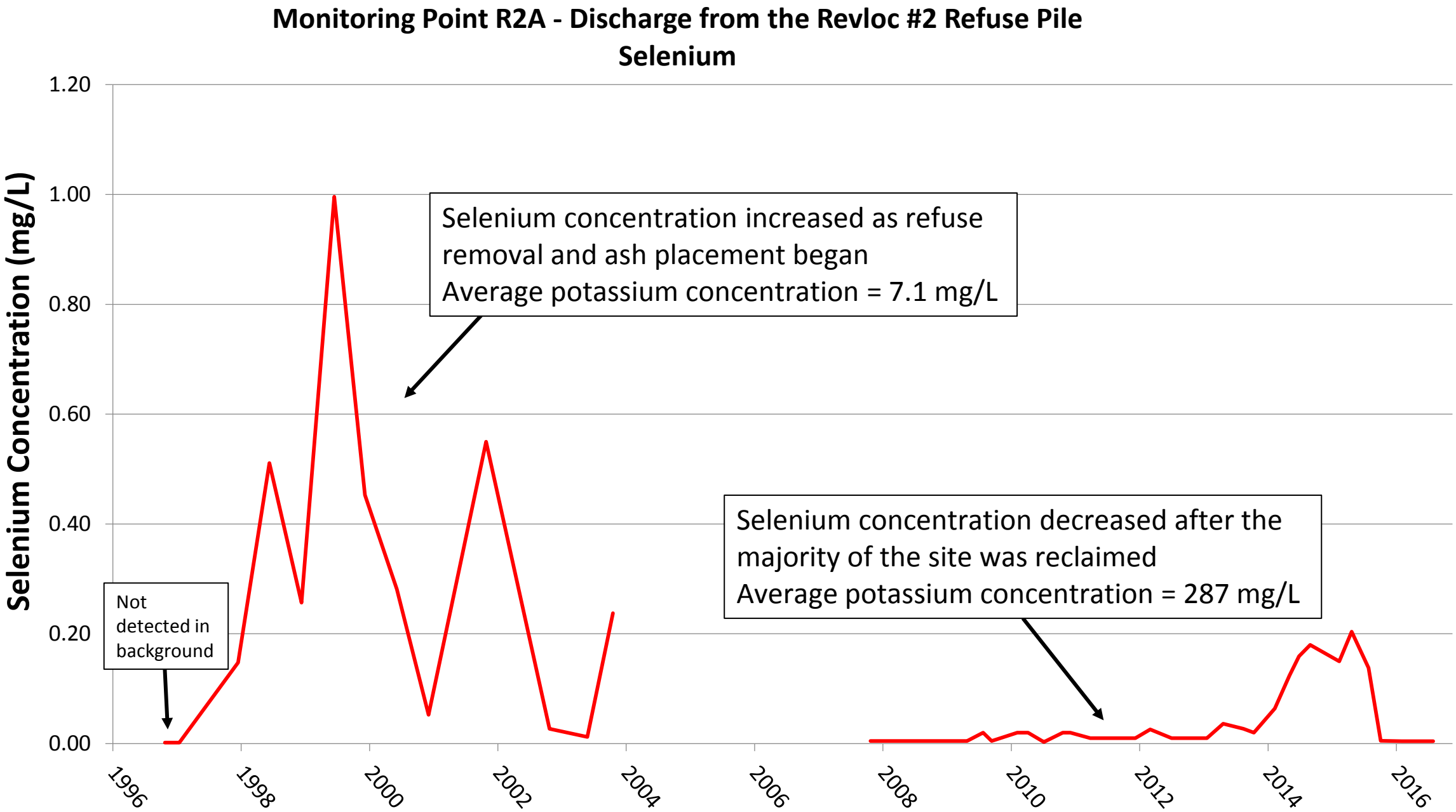




Monitoring Point R2A –Discharge from the Revloc #2 Refuse Pile

- Five background samples were collected from the R2A discharge prior to any disturbance of the refuse pile or placement of FBC ash.
  - During the time the background samples were collected not all constituents were required by the Department (ex. Antimony, Beryllium, Boron, etc.).
- The background samples were compared to the samples collected after reclamation was completed.
  - ↓ indicates decreased concentration compared to background.
  - ↑ indicates increased concentration compared to background.
  - = indicates no significant difference between the background concentration and the latest data.
- The only constituent with a higher concentration in the post-reclamation samples compared to the background samples was selenium.

	Average Baseline Concentration 1996-1997 (mg/L)	Average Post-reclamation Concentration 2012-2016 (mg/L)
Antimony	Not Measured	0.02
Arsenic ↓	0.24	0.02
Barium	No detections (at limit of 0.2 mg/L)	0.05
Beryllium	Not Measured	0.005 (one detection out of 16 samples)
Boron	Not Measured	0.03 (two detections of 16 samples)
Cadmium ↓	0.08 (one detection out of five samples)	0.002 (four detections out of 16 samples)
Chromium ↓	0.16 (one detection out of five samples)	0.002 (two detections out of 16 samples)
Cobalt ↓	Not Measured	0.03 (five detections out of 16 samples)
Copper ↓	0.94	0.02 (9 detections of out 16 samples)
Lead ↓	0.28	0.02 (6 detections out of 16 samples)
Mercury	No Detections	No Detections
Molybdenum	Not Measured	0.02 (eight detections of out 16 samples)
Nickel ↓	5.95	0.01 (three detections of out 16 samples)
Selenium ↑	No Detections	0.10 (11 detections out of 16 samples)
Silver	No Detections (at limit of 0.06 mg/L)	0.02 (five detections of out 16 samples)
Thallium	Not Measured	0.01 (five detections of out 16 samples)
Vanadium	Not Measured	No Detections
Zinc ↓	3.68	0.03 (three detections out of 16 samples)


Monitoring Point R2A - Discharge from the Revloc #2 Refuse Pile
Selenium
Selenium Concentration (mg/L)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Selenium concentration increased as refuse removal and ash placement began
Average potassium concentration = 7.1 mg/L
Not detected in background
Selenium concentration decreased after the majority of the site was reclaimed
Average potassium concentration = 287 mg/L

Colver Refuse Pile 1993

Prior to reclamation

Refuse pile covers ~ 92 acres

Colver Refuse Pile 2011

During reclamation

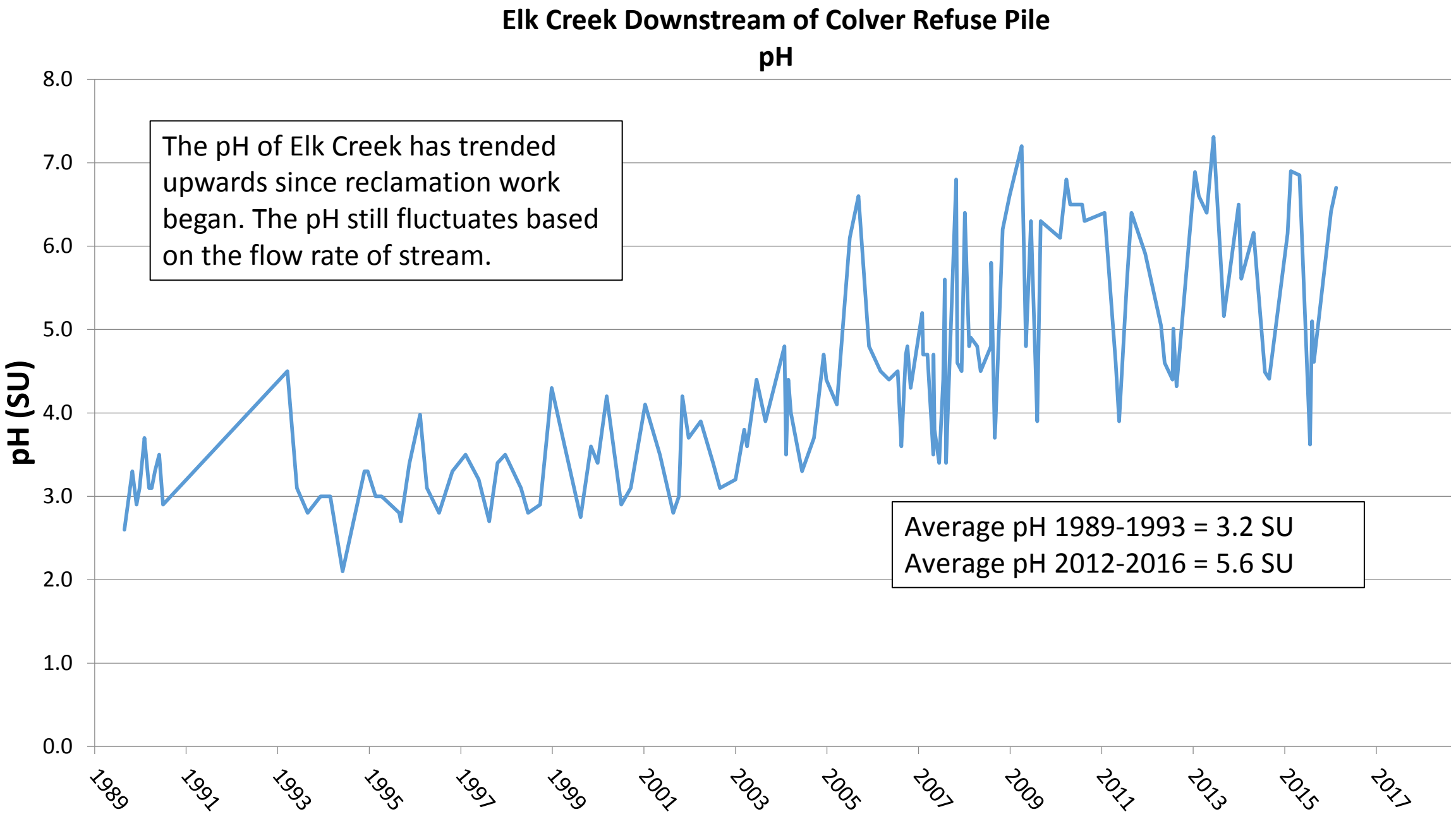
Colver
Refuse Pile
2015

During
reclamation

Colver

- Three discharges total
  - Two became net alkaline
  - One is intermittently net alkaline.

	Average Baseline Loading December 1989-May 1991	Average Loading January 2012-June 2016	Percent Reduction
Acidity (kg/day)	1,985	0.83	99.9
Iron (kg/day)	741	0.64	99.9
Aluminum (kg/day)	174	0.09	99.9
Manganese (kg/day)	5.85	0.12	98


Elk Creek Downstream of Colver Refuse Pile
pH
pH (SU)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
The pH of Elk Creek has trended upwards since reclamation work began. The pH still fluctuates based on the flow rate of stream.
Average pH 1989-1993 = 3.2 SU
Average pH 2012-2016 = 5.6 SU

Ash Monitoring at the Colver Refuse Pile

- There are four monitoring wells that are used to monitor the effects of the FBC ash placement.
  - Upgradient wells MW1 and MW4
  - Downgradient wells MW2 and MW3

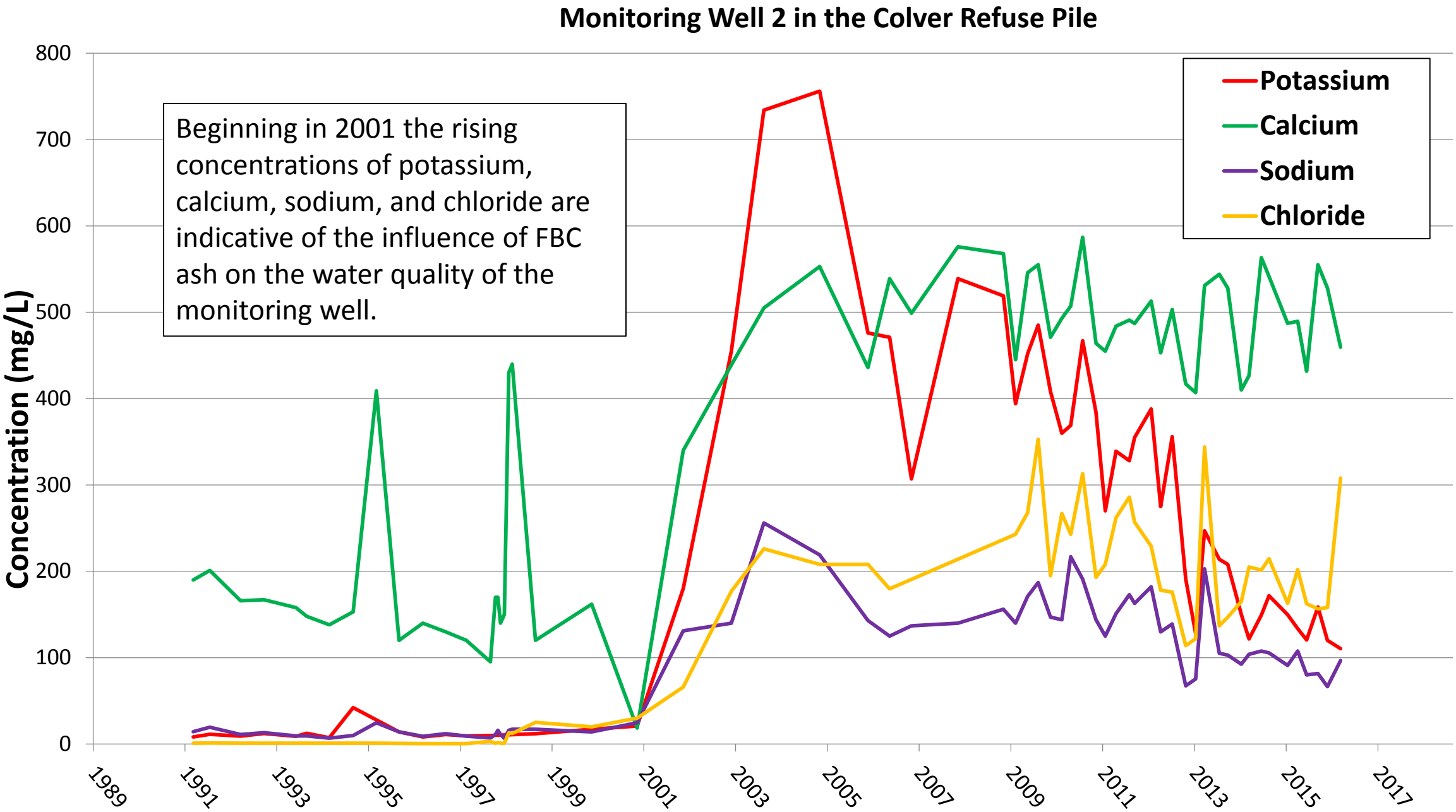
- The water quality of the downgradient monitoring wells MW-2 and MW-3 was influence by the ash placement.

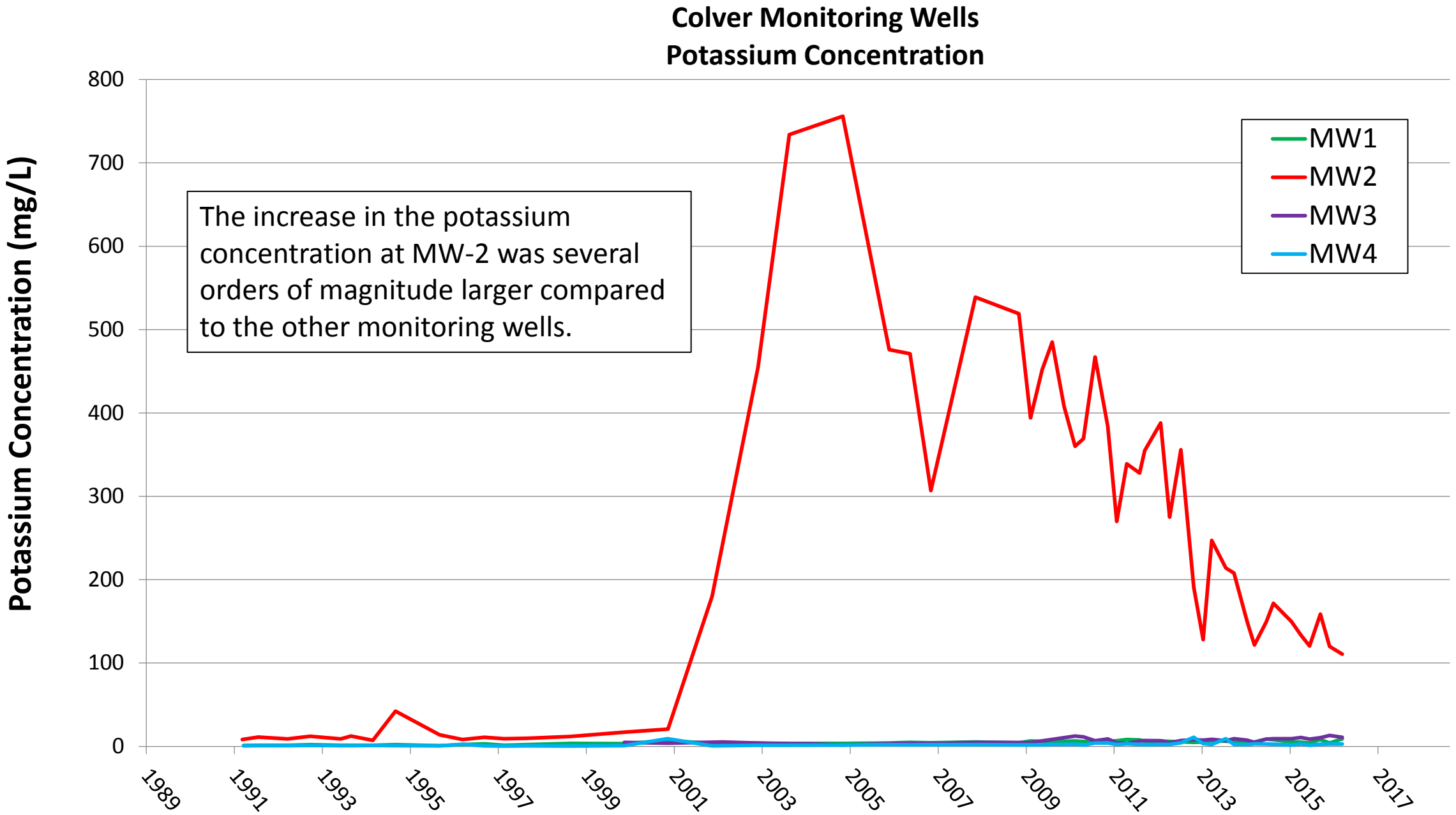
- Two of the discharges from the refuse pile were also sampled quarterly starting in 1997 as part of ash monitoring.
  - SW-4A and SW-23

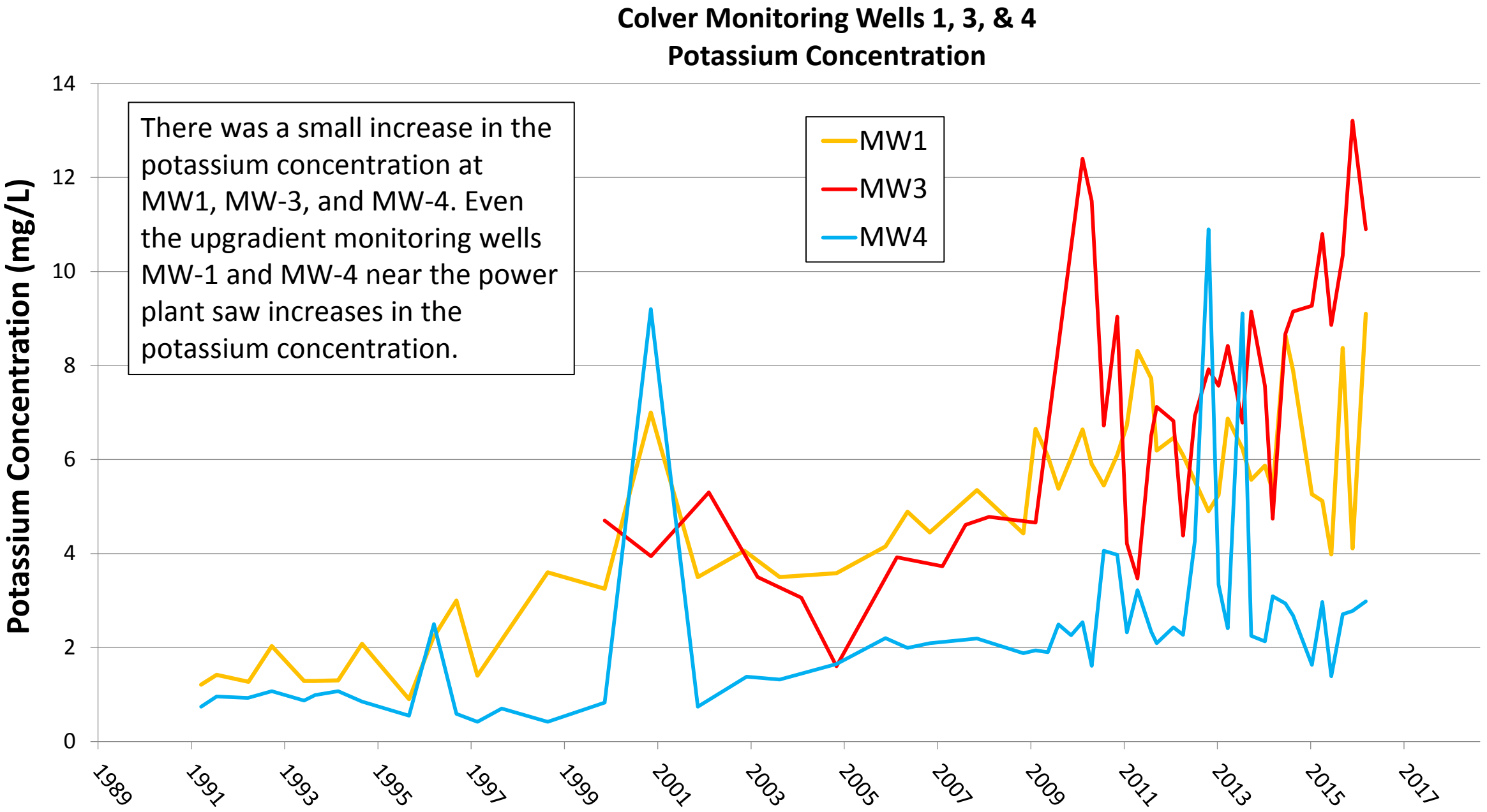
Monitoring Well 2 in the Colver Refuse Pile

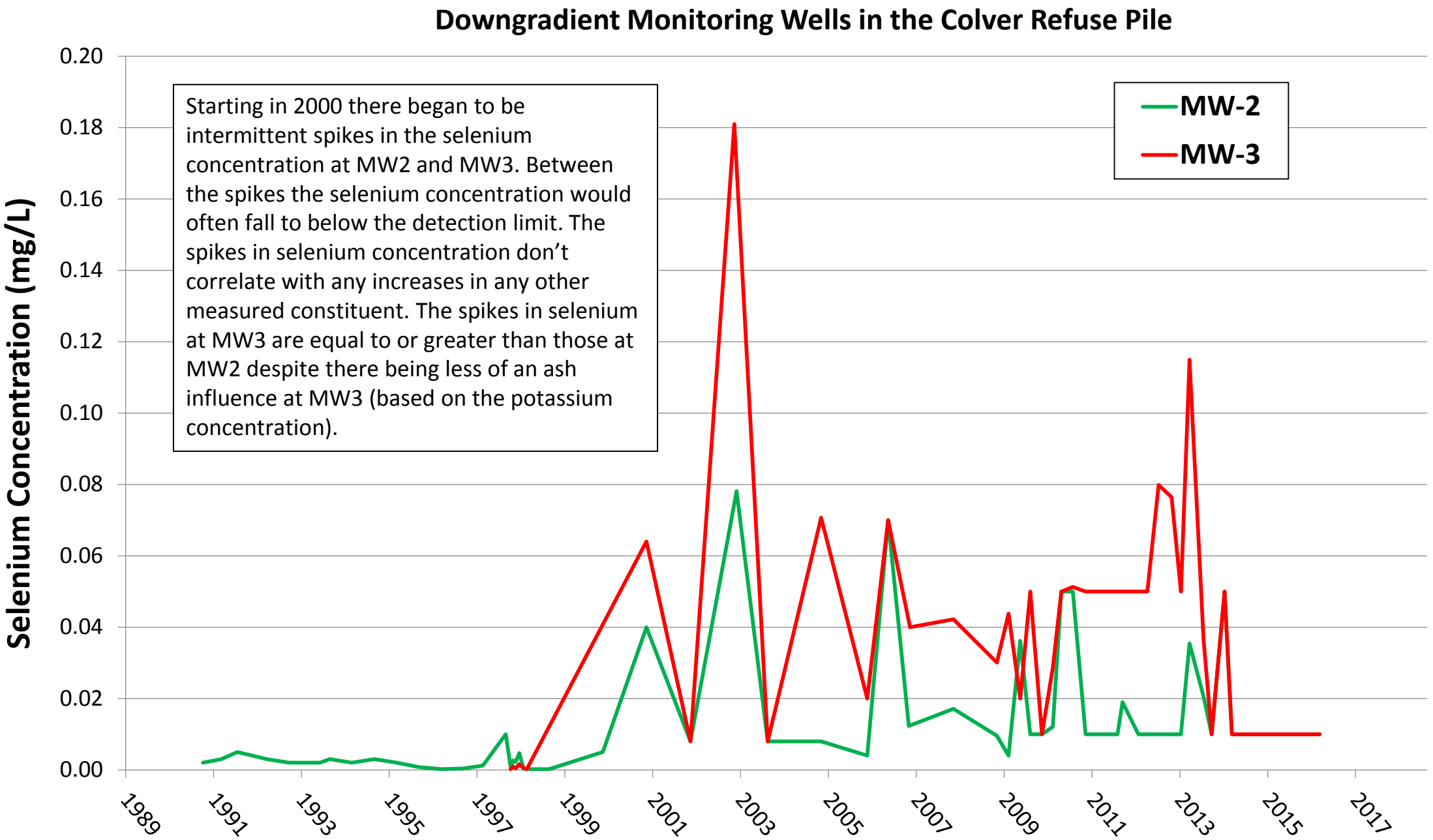
- Nine background samples were collected from Monitoring Well 2 prior to placement of FBC ash.
  - During the time the background samples were collected not all constituents were required by the Department (ex. Antimony, Beryllium, Boron, etc.).
- The background samples were compared to the samples collected after reclamation was completed.
  - ↓ indicates decreased concentration compared to background.
  - ↑ indicates increased concentration compared to background.
  - = indicates no significant difference between the background concentration and the latest data.
- The only constituent with a higher concentration in the post-reclamation samples compared to the background samples was selenium.

	Average Baseline Concentration 1990-1994 (mg/L)	Average Concentration 2012-2016 (mg/L)
Antimony	Not Measured	No Detections
Arsenic ↓	1.18	0.40
Barium ↓	0.06 (four detections out of nine samples)	0.01 (ten detections out of 18 samples
Beryllium	Not Measured	0.003 (ten detections out of 18 samples)
Boron	Not Measured	0.02 (five detections out of 18 samples)
Cadmium ↓	0.15 (seven detections out of nine samples)	0.009 (three detections out of 18 samples)
Chromium ↓	0.37	0.02 (six detections out of 18 samples)
Cobalt	Not Measured	0.16
Copper ↓	1.10	0.02 (seven detections out of 18 samples)
Lead ↓	0.19 (six detections of out nine samples)	0.02 (13 detections out of 18 samples)
Mercury =	0.0004 (one detection out of nine samples)	No Detections
Molybdenum	Not Measured	0.01 (two detections out of 18 samples)
Nickel	Not Measured	0.08 (17 detections of the 18 samples)
Selenium ↑	0.003 (eight detections out of nine samples)	0.03 (two detections out of 18 samples)
Silver ↓	1.8 (one detection out of nine samples)	0.03 (eight detections out of 18 samples)
Thallium	Not Measured	0.03 (nine detections out of 18 samples)
Vanadium	Not Measured	0.03 (three detections out of 18 samples)
Zinc ↓	2.69	0.21


Monitoring Well 2 in the Colver Refuse Pile
Beginning in 2001 the rising concentrations of potassium, calcium, sodium, and chloride are indicative of the influence of FBC ash on the water quality of the monitoring well.
Potassium
Calcium
Sodium
Chloride
Concentration (mg/L)
800
700
600
500
400
300
200
100
0
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017


Colver Monitoring Wells
Potassium Concentration
Potassium Concentration (mg/L)
800
700
600
500
400
300
200
100
0
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
MW1
MW2
MW3
MW4
The increase in the potassium concentration at MW-2 was several orders of magnitude larger compared to the other monitoring wells.


Colver Monitoring Wells 1, 3, & 4
Potassium Concentration
There was a small increase in the potassium concentration at MW1, MW-3, and MW-4. Even the upgradient monitoring wells MW-1 and MW-4 near the power plant saw increases in the potassium concentration.
MW1
MW3
MW4
Potassium Concentration (mg/L)
0
2
4
6
8
10
12
14
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017

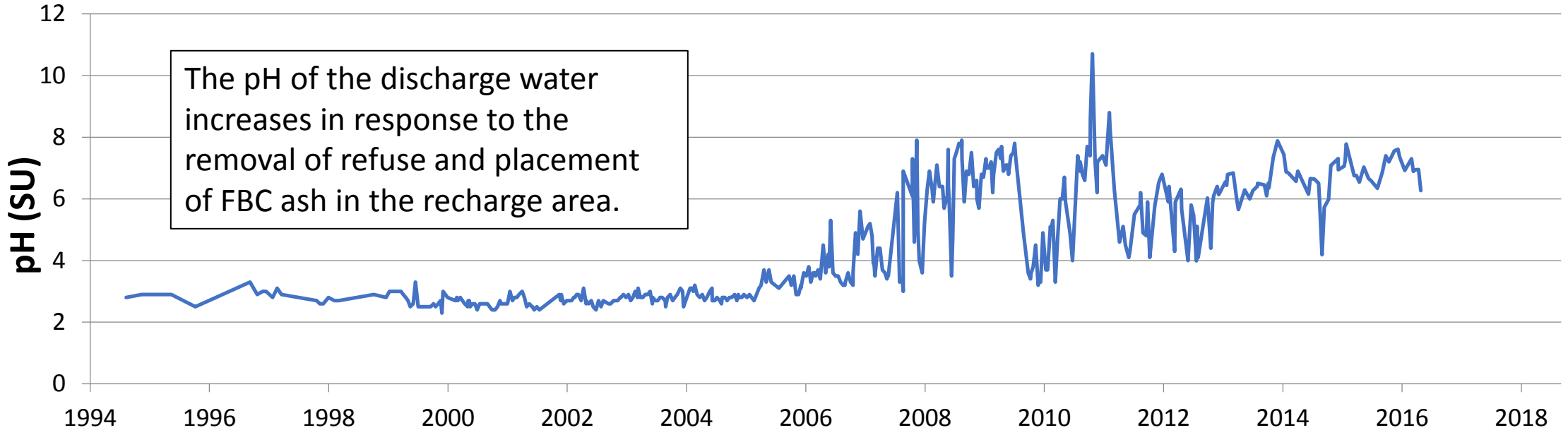

Downgradient Monitoring Wells in the Colver Refuse Pile
Starting in 2000 there began to be intermittent spikes in the selenium concentration at MW2 and MW3. Between the spikes the selenium concentration would often fall to below the detection limit. The spikes in selenium concentration don't correlate with any increases in any other measured constituent. The spikes in selenium at MW3 are equal to or greater than those at MW2 despite there being less of an ash influence at MW3 (based on the potassium concentration).
MW-2
MW-3
Selenium Concentration (mg/L)
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017

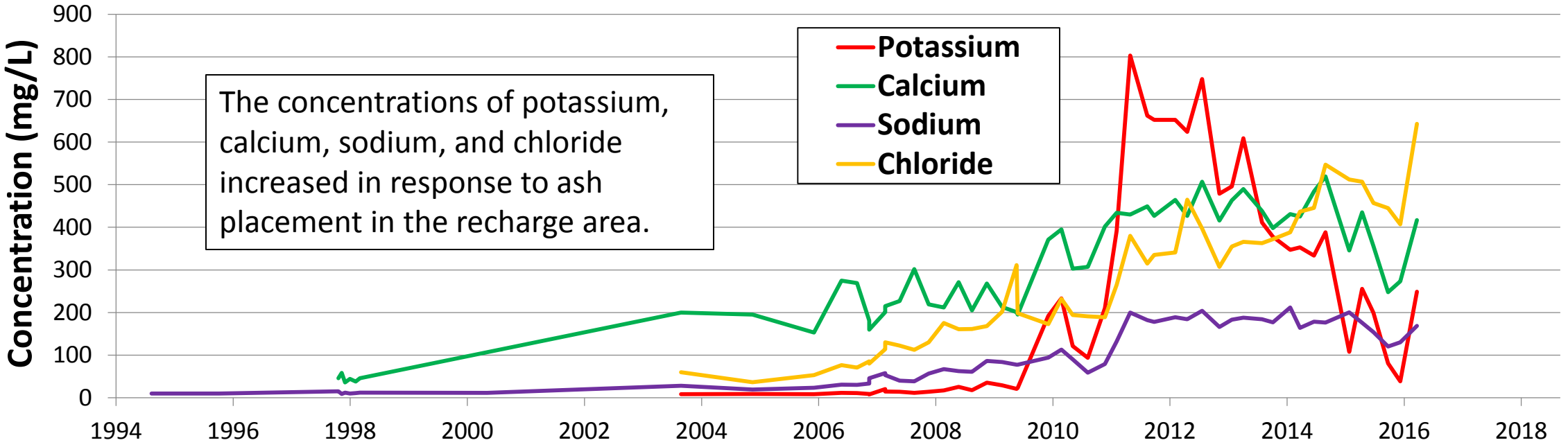
Monitoring Point SW-4A – Discharge from the Colver Refuse Pile

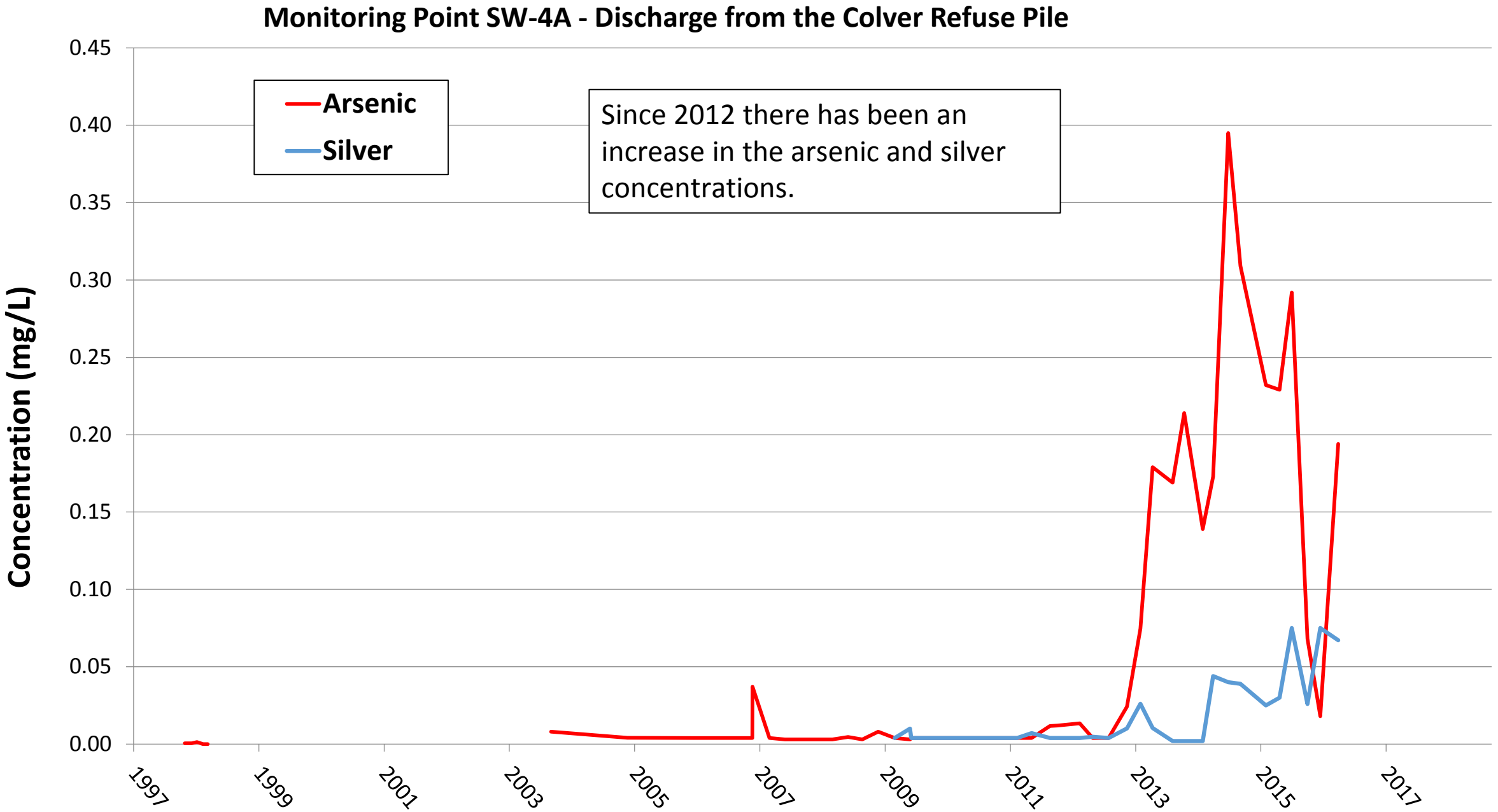
- Six background samples were collected of drainage from the refuse pile after there had been placement of FBC ash but before the water chemistry showed any influence from the ash.
  - During the time the background samples were collected not all constituents were required by the Department (ex. Antimony, Beryllium, Boron, etc.).
- The background samples were compared to the samples collected after reclamation was completed.
  - ↓ indicates decreased concentration compared to background.
  - ↑ indicates increased concentration compared to background.
  - = indicates no significant difference between the background concentration and the latest data.
- The only constituents with a higher concentration in the post-reclamation samples compared to the background samples were selenium and arsenic.

	Average Baseline Concentration 1997-1998 (mg/L)	Average Concentration 2012-2016 (mg/L)
Antimony	Not Measured	0.47 (three detections out of 18 samples)
Arsenic ↑	0.0008 (three detections out six samples)	0.17 (16 detections out of 18 samples)
Barium	Not Measured	0.03
Beryllium	Not Measured	0.002 (two detections out of 18 samples)
Boron	Not Measured	0.04 (16 detections out of 18 samples)
Cadmium =	0.0004 (four detections out of six samples)	0.004 (two detections out of 18 samples)
Chromium ↓	0.03 (five detections out of six samples)	0.004 (six out of 18 samples)
Cobalt	Not Measured	0.02 (seven detections out of 18 samples)
Copper =	0.01 (three detections out of six samples)	0.02 (four detections out of 18 samples)
Lead ↓	0.01 (five detections out of six samples)	0.008 (eight detections out of 18 samples)
Mercury =	0.0009 (two detections out of six samples)	No Detections
Molybdenum	Not Measured	0.02 (eight detections out of 18 samples)
Nickel ↓	0.04	0.01 (seven detections out of 18 samples)
Selenium ↑	0.0007 (five detections out of six samples)	0.03 (13 detections out of 18 samples)
Silver	Not Measured	0.04 (13 detections out of 18 samples)
Thallium	Not Measured	0.006 (two detections out of 18 samples)
Vanadium	Not Measured	0.02 (five detections out of 18 samples)
Zinc ↓	0.06	0.02 (13 detections out of 18 samples)

Monitoring Point SW-4A - Discharge from the Colver Refuse Pile





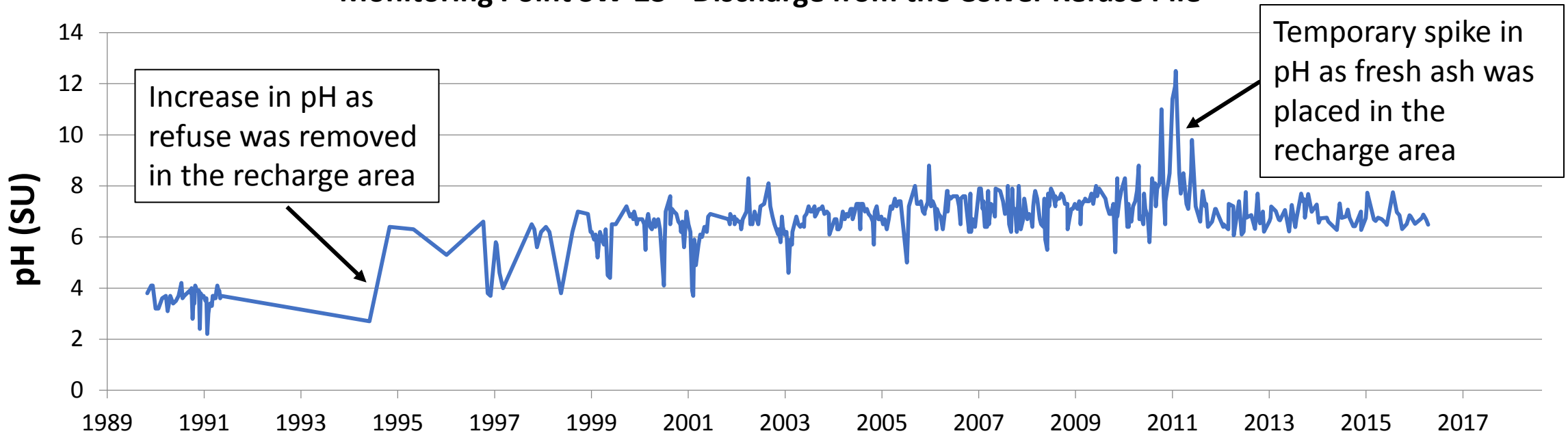

Monitoring Point SW-4A - Discharge from the Colver Refuse Pile
Arsenic
Silver
Since 2012 there has been an increase in the arsenic and silver concentrations.
Concentration (mg/L)
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017

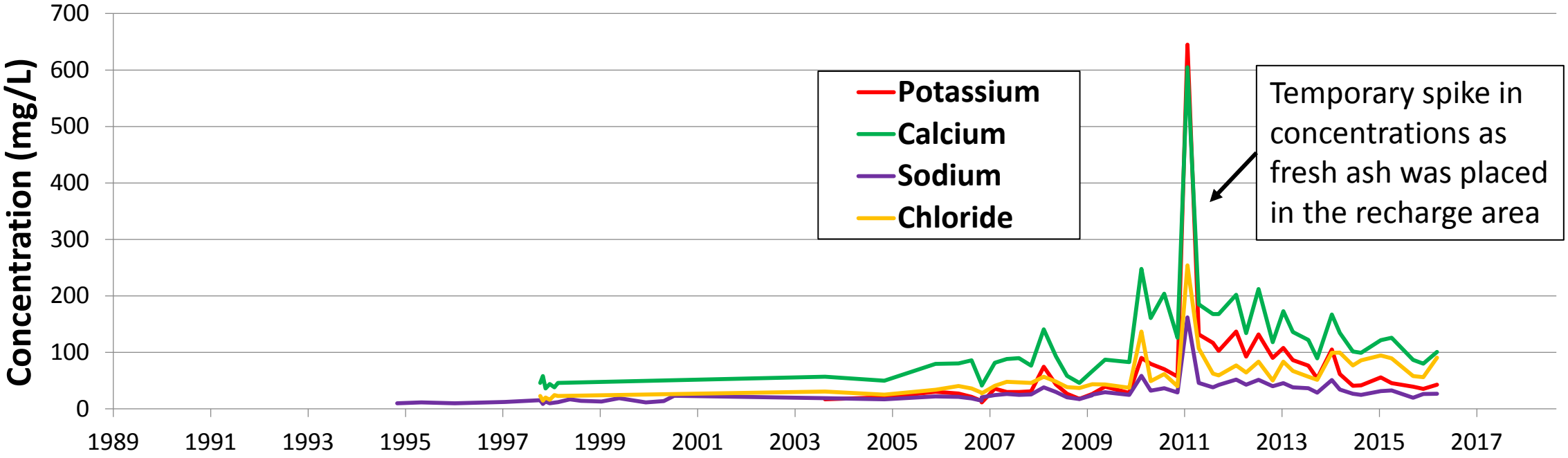
Monitoring Point SW-23 – Discharge from the Colver Refuse Pile

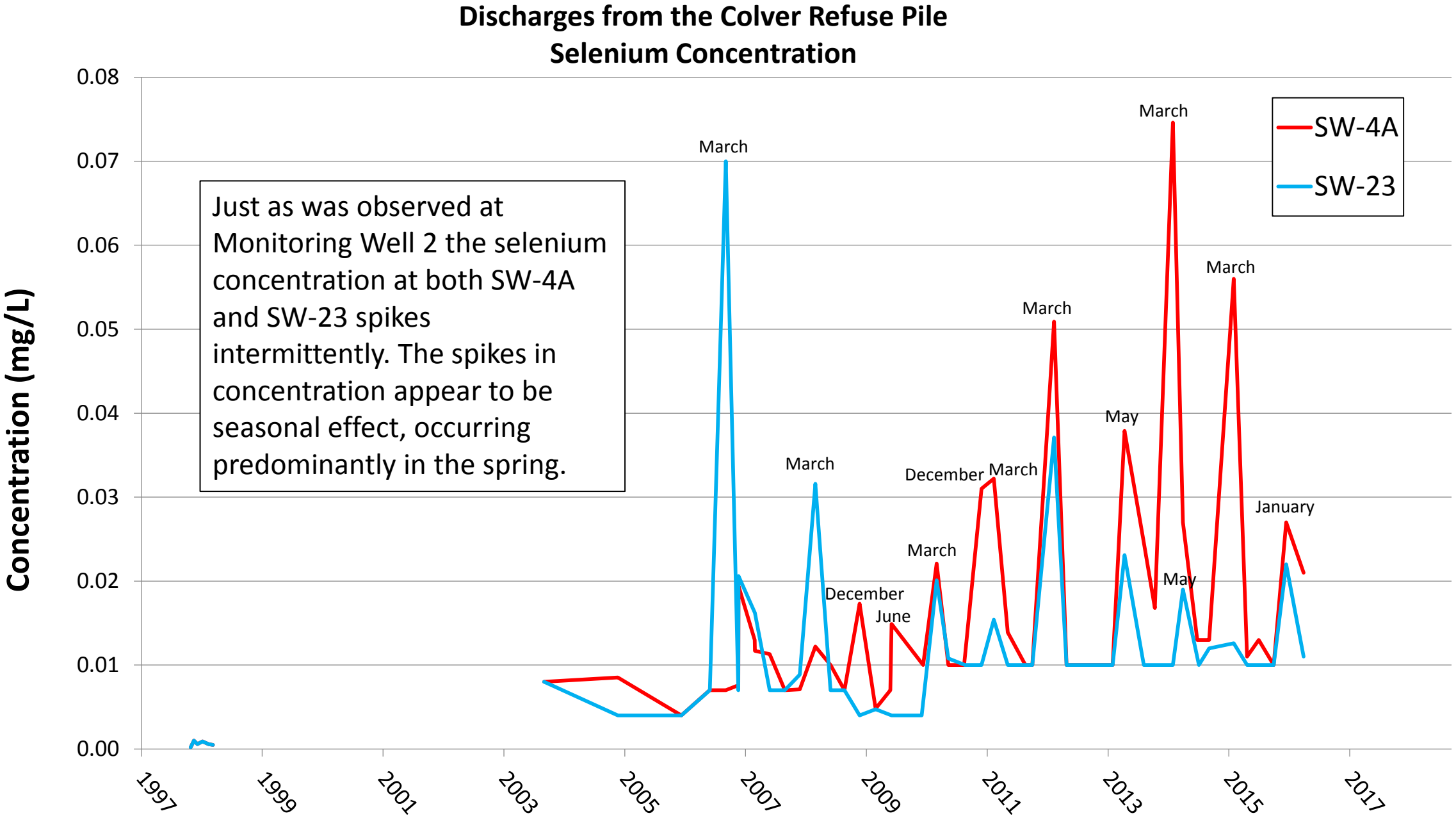
- Six background samples were collected of drainage from the refuse pile after there had been placement of FBC ash but before the water chemistry showed any influence from the ash.
  - During the time the background samples were collected not all constituents were required by the Department (ex. Antimony, Beryllium, Boron, etc.).
- The background samples were compared to the samples collected after reclamation was completed.
  - ↓ indicates decreased concentration compared to background.
  - ↑ indicates increased concentration compared to background.
  - = indicates no significant difference between the background concentration and the latest data.
- The only constituent with a higher concentration in the post-reclamation samples compared to the background samples was selenium.

	Average Baseline Concentration 1997-1998 (mg/L)	Average Concentration 2012-2016 (mg/L)
Antimony	Not Measured	No Detections
Arsenic =	0.0008 (three detections out of six samples)	0.007 (three detections out of 17 samples)
Barium	Not Measured	0.03
Beryllium	Not Measured	No Detections
Boron	Not Measured	0.02 (ten detections out of 17 samples)
Cadmium ↓	0.0004 (four detections out of six samples)	No Detections
Chromium ↓	0.03 (five detections out of six samples)	0.002 (one detection out of 17 samples)
Cobalt	Not Measured	No Detections
Copper =	0.01 (three detections out of six samples)	0.02 (two detections out of 17 samples)
Lead ↓	0.01 (five detections out of six samples)	0.009 (two detections out of 17 samples)
Mercury ↓	0.0009 (two detections out of six samples)	No Detections
Molybdenum	Not Measured	No Detections
Nickel ↓	0.04	0.01 (one detection out of 17 samples)
Selenium ↑	0.0007 (five detections out of six samples)	0.02 (seven detections out of 17 samples)
Silver	Not Measured	0.01 (nine detections out of 17 samples)
Thallium	Not Measured	0.006 (one detections out of 17 samples)
Vanadium	Not Measured	0.05 (four detections out of 17 samples)
Zinc ↓	0.06	0.04 (16 detections out of 17 samples)

Monitoring Point SW-23 - Discharge from the Colver Refuse Pile






Discharges from the Colver Refuse Pile
Selenium Concentration
Concentration (mg/L)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
SW-4A
SW-23
Just as was observed at Monitoring Well 2 the selenium concentration at both SW-4A and SW-23 spikes intermittently. The spikes in concentration appear to be seasonal effect, occurring predominantly in the spring.
March
March
March
December
March
March
May
March
January
December
June
March
May

Nanty Glo West Refuse Pile 2004

Prior to reclamation

Refuse pile covers ~ 34 acres

Nanty Glo West Refuse Pile
2001

Receiving stream (Pergrin Run) at the toe of the refuse pile

Prior to reclamation

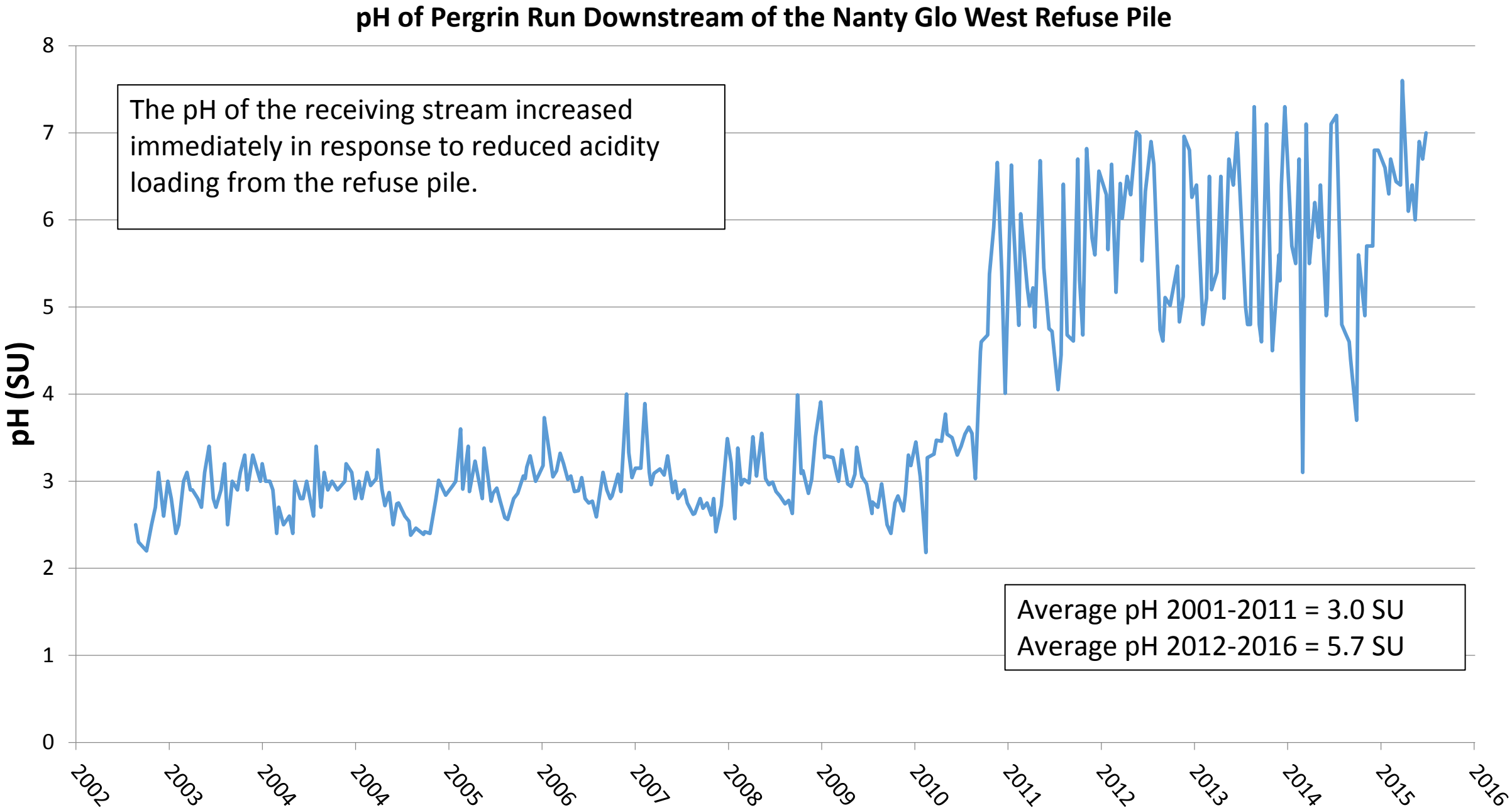
Nanty Glo West Refuse Pile
2014

During reclamation

Nanty Glo West

- Eight discharges total
  - Seven discharges were combined in a French drain, which remained acidic but with a reduced pollutional loading.
  - The other discharge is now normally dry.

	Average Baseline Loading November 2001 - November 2004	Average Loading January 2013 - August 2016	Percent Reduction
Acidity (kg/day)	637	32.2	95
Iron (kg/day)	117	2.50	98
Aluminum (kg/day)	62.9	4.0	94
Manganese (kg/day)	0.90	0.40	56
Sulfate (kg/day)	746	116	84


pH of Pergrin Run Downstream of the Nanty Glo West Refuse Pile
The pH of the receiving stream increased immediately in response to reduced acidity loading from the refuse pile.
Average pH 2001-2011 = 3.0 SU
Average pH 2012-2016 = 5.7 SU
pH (SU)
0
1
2
3
4
5
6
7
8
2002
2003
2004
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016

Ash Monitoring at the Nanty Glo West Refuse Pile

- There is one monitoring well that is used to monitor the effects of the FBC ash placement.
- At this time the monitoring well shows no influence from the ash placement.
- Three of the discharges from the refuse pile were also sampled quarterly as part of ash monitoring.
  - The French drain was later sampled as an ash monitoring point once the discharges were combined.
  - Background data was provided with the permit application so the pre and post-mining concentrations can be compared.

Discharge from the Nanty Glo West Refuse Pile

- Eight background samples were collected of drainage from the refuse pile prior to any refuse removal or placement for FBC ash.
  - During the time the background samples were collected not all constituents were required by the Department (ex. Antimony, Beryllium, Boron, etc.).
- The background samples were compared to the samples collected after reclamation was completed.
  - ↓ indicates decreased concentration compared to background.
  - ↑ indicates increased concentration compared to background.
  - = indicates no significant difference between the background concentration and the latest data.
- No constituents had a higher concentration in the post-reclamation samples compared to the background samples.

	Average Baseline Concentration 2002-2004 (mg/L)	Average Concentration 2013-2016 (mg/L)
Antimony	Not Measured	0.01 (five detections out of 15 samples)
Arsenic ↓	0.68	0.02 (ten detections out of 15 samples)
Barium	Not Measured	0.09 (three detections out of 15 samples)
Beryllium	Not Measured	0.008 (one detection out of 15 samples)
Boron	Not Measured	0.09 (14 detections out of 15 samples)
Cadmium	Not Detected (at 0.05 mg/L limit)	0.002 (12 detections out of 15 samples)
Chromium ↓	0.43	0.02
Cobalt	Not Measured	0.25
Copper ↓	2.41	0.24
Lead ↓	0.28	0.02
Mercury	Not Detected	Not Detected
Molybdenum	Not Measured	Not Detected
Nickel ↓	3.54	0.46
Selenium ↓	0.59	0.09 (six detections out of 15 samples)
Silver	Not Measured	0.01 (five detections out of 15 samples)
Thallium	Not Measured	0.002 (six detections out of 15 samples)
Vanadium	Not Measured	0.04 (seven detections out of 15 samples)
Zinc ↓	2.30	0.74

Nanty Glo East Refuse Pile 2004

Prior to reclamation

Refuse pile covers ~ 50 acres

Southern End of the Nanty Glo East Refuse Pile
2014

During reclamation

Nanty Glo East

- Four discharges total
  - All four discharges remained acidic but with a reduced pollutional loading.

	Average Baseline Loading December 2003 - April 2005	Average Loading January 2015 - September 2016	Percent Reduction
Acidity (kg/day)	1,399	133	91
Iron (kg/day)	153	8.00	95
Aluminum (kg/day)	121	17.0	86
Manganese (kg/day)	8.00	2.00	75
Sulfate (kg/day)	1,983	278	86

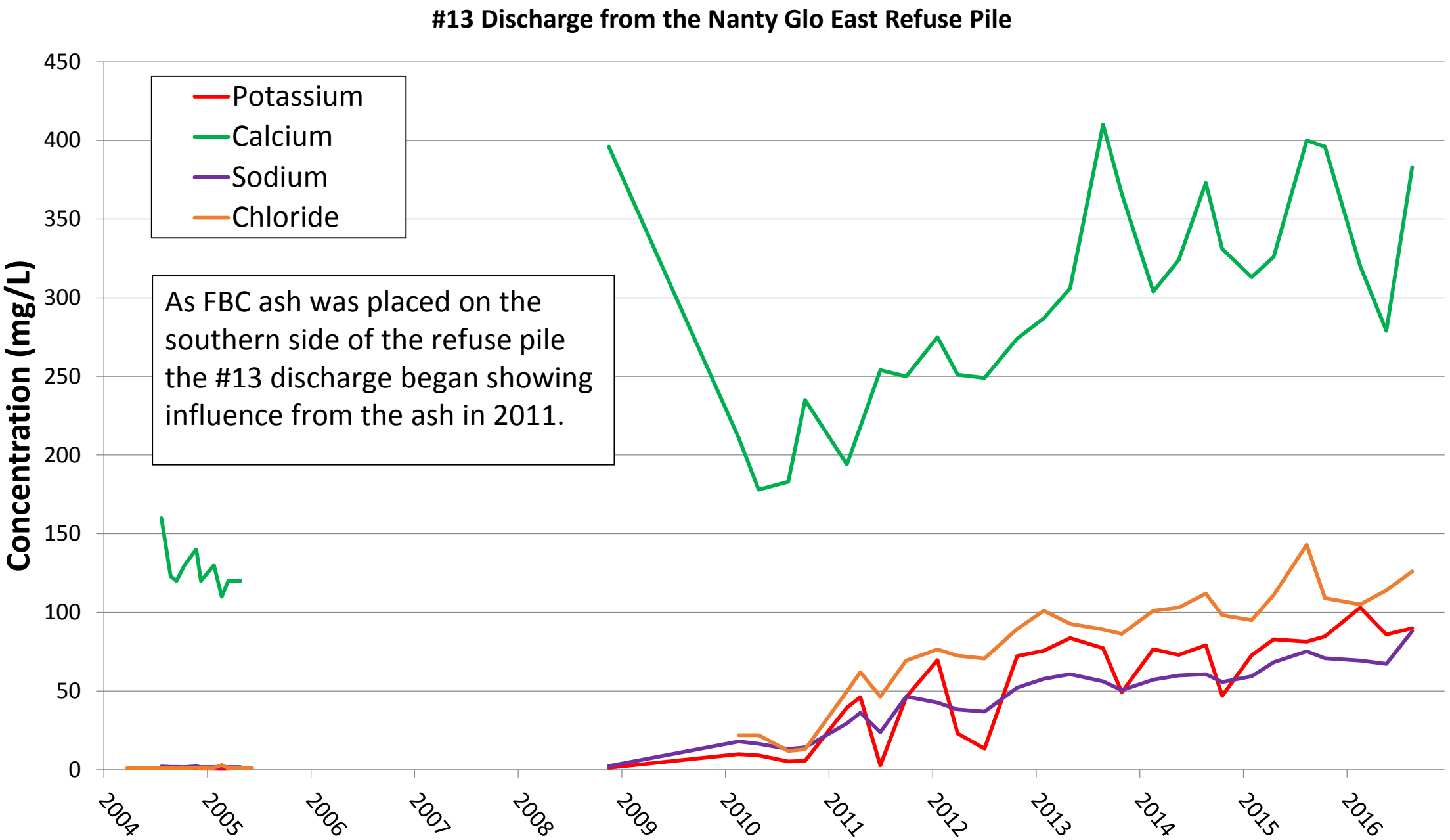
Ash Monitoring at the Nanty Glo East Refuse Pile

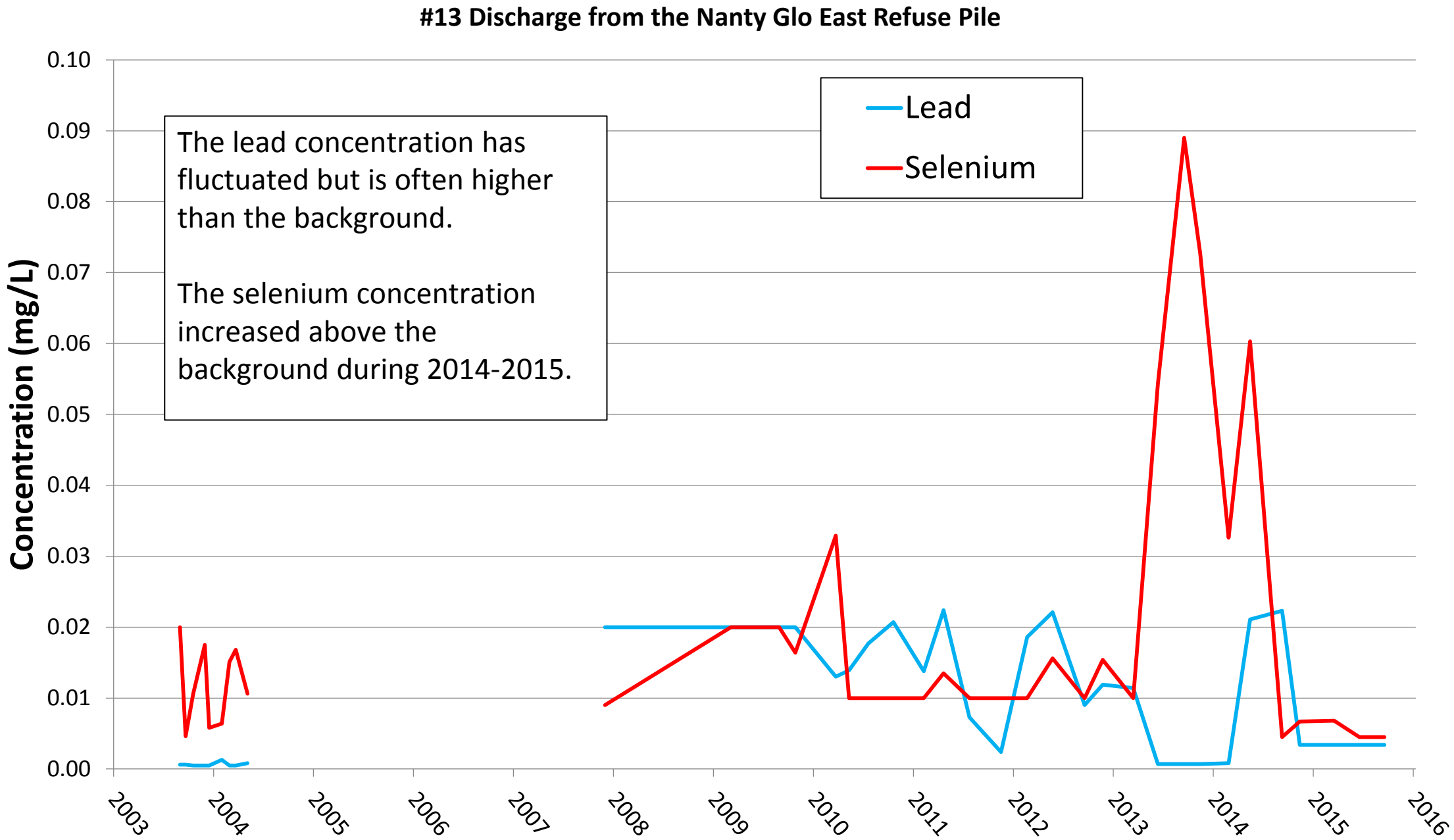
- There are three monitoring wells that are used to monitor the effects of the FBC ash placement.
- At this time none of the monitoring wells show any influence from the FBC ash placement.
- Two of the discharges from the refuse pile were also sampled quarterly as part of ash monitoring.
  - #13 and #14
  - At this time only discharge #13 shows any influence from FBC ash.

#13 Discharge from the Nanty Glo East Refuse Pile

- Eight background samples were collected from monitoring point 13 prior to any refuse removal or placement for FBC ash.
  - During the time the background samples were collected not all constituents were required by the Department (ex. Antimony, Beryllium, Boron, etc.).
- The background samples were compared to the samples collected after reclamation was completed.
  - ↓ indicates decreased concentration compared to background.
  - ↑ indicates increased concentration compared to background.
  - = indicates no significant difference between the background concentration and the latest data.
- Selenium and lead had a higher concentration in the post-reclamation samples compared to the background samples.

	Average Baseline Concentration 2003-2005 (mg/L)	Average Concentration 2015-2016 (mg/L)
Antimony	Not Measured	0.007 (one detection out of seven samples)
Arsenic ↓	0.04 (eight detections out of nine samples)	0.02 (three detections out of seven samples)
Barium	Not Measured	0.06 (four detections out of seven samples)
Beryllium	Not Measured	0.01
Boron	Not Measured	Not Detected
Cadmium ↓	0.02 (five detections out of ten samples)	0.004
Chromium ↓	0.09	0.02
Cobalt	Not Measured	0.37
Copper ↓	0.51	0.13
Lead ↑	0.001 (six detections out of ten samples)	0.01 (three detections out of seven samples)
Mercury	Not Detected	Not Detected
Molybdenum	Not Measured	Not Detected
Nickel ↓	0.91	0.56
Selenium ↑	0.01 (nine detections out of ten samples)	0.03 (four detections out of seven samples)
Silver	Not Measured	Not Detected
Thallium	Not Measured	0.0005 (four detections out of seven samples)
Vanadium	Not Measured	0.06 (one detection out of seven samples)
Zinc ↓	1.91	1.16


#13 Discharge from the Nanty Glo East Refuse Pile
Concentration (mg/L)
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Potassium
Calcium
Sodium
Chloride
As FBC ash was placed on the southern side of the refuse pile the #13 discharge began showing influence from the ash in 2011.


#13 Discharge from the Nanty Glo East Refuse Pile
Concentration (mg/L)
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Lead
Selenium
The lead concentration has fluctuated but is often higher than the background.
The selenium concentration increased above the background during 2014-2015.

Total Reductions in Loading to the Blacklick Creek Watershed

	Total Average Baseline Loading	Total Average Recent Loading	Total Reduction	Percent Reduction
Acidity (kg/day)	4,826	204	4,622	96
Iron (kg/day)	1,016	11	1,004	99
Aluminum (kg/day)	467	26	441	94
Manganese (kg/day)	23	3	20	87
Sulfate (kg/day)	3,789	689	3,100	82

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Conclusions

- Reclamation of the refuse piles using FBC ash has greatly diminished the loadings of pollutants to the Blacklick Creek watershed.
- The placement of FBC ash has changed the chemistry of the water discharging from the piles.
  - Increasing concentrations of potassium, sodium, chloride, and calcium.
  - There have been a few observed increases in the trace elements that are part of the ash monitoring:
    - An increase selenium was observed at four out of five sites.
    - Increases in lead, silver, and arsenic were observed at one discharge.
- Water monitoring is required for ten years after the date of the last ash placement on a refuse reprocessing site.
  - Of the five sites in this study the first to complete the ten year monitoring requirement will be Revloc #2 in 2018.

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Fishing Derby on South Branch Blacklick Creek
Nanty Glo, PA
April 23, 2016

Thank You!
Any Questions?

- Contact Information:
  - Cambria District Mining Office
    286 Industrial Park Road
    Ebensburg, PA 15931

    Greg Aaron's Email Address: gaaron@pa.gov
    Rock Martin Email Address: martin@pa.gov
    Greg Greenfield's Email Address: grgreenfie@pa.gov

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Yellow Creek Watershed Assessment

January 2022

Appendix 4: Lucerne refuse pile NPDES permit locations

NPDES permit associated with the Lucerne Refuse Pile reclamation project. Retrieved from PADEP January 19, 2022.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF DISTRICT MINING OPERATIONS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) INDIVIDUAL PERMIT (COAL)

NPDES PERMIT NO.:	PA0213039	PERMITTEE NAME:	Compass Coal Company, Inc.
MINING PERMIT NO.:	32950202	OPERATION NAME:	Lucerne
MUNICIPALITY:	Center Township	COUNTY:	Indiana

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 et seq. (the "Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 et seq., the Department of Environmental Protection (Department) hereby approves the discharge to the following surface water(s): **Unnamed tributaries to Yellow Creek** subject to all effluent limitations, monitoring and reporting requirements and other terms, conditions, criteria, and special requirements for the discharge as defined in this permit, to surface waters of the Commonwealth. This permit is issued pursuant to the authority in 25 Pa. Code Chapter 92a and is subject to the requirements of 25 Pa. Code Chapter 92a.

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the terms and conditions of this permit, the terms and conditions of this permit shall apply.

2. Failure to comply with the terms, conditions, or effluent limitations of this permit is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. [40 CFR 122.41(a)]

3. A complete application for renewal or reissuance of this permit, or notice of intent to cease discharging by the expiration date, must be submitted to DEP at least 180 days prior to the above expiration date (unless permission has been granted by DEP for submission at a later date), using the appropriate NPDES permit application form. [92a.21(c)] In the event that a timely and complete application for renewal or reissuance has been submitted and DEP is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit, including submission of the Discharge Monitoring Reports ("DMRs"), will be automatically continued and will remain fully effective and enforceable against the discharger until DEP takes final action on the pending permit application. [25 Pa. Code § 92a.7]

4. The permit may be terminated prior to the expiration date upon notice to and approval by the Department.

5. No condition of this permit shall release the operator from any responsibility or requirement under Pennsylvania, or federal environmental statutes, and regulations or local ordinances.

6. This permit is subject to the requirements of the mining permit referenced above.

EFFECTIVE DATE: **February 1, 2022** **EXPIRATION DATE:** **November 22, 2025**

RENEWAL DATES: September 17, 2020; March 15, 2016, December 1, 2010; September 25, 2005; June 26, 2000

REISSUANCE DATES: March 20, 2019; January 20, 2015, September 26, 2005

TRANSFER DATES: January 10, 2022

AUTHORIZED BY: David D. Thomas, District Mining Manager

Template rev 6/2021

PART A
EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Section A. MINE DRAINAGE TREATMENT FACILITIES

☐ There are no point source discharges of this type at this site.

☐ The facilities listed below utilize non-discharge technologies.

Outfall No.	Latitude			Longitude			To
005	40°	32'	54"	79°	09'	05"	UNT to Yellow Creek
_____	____°	____'	____"	____°	____'	____"	_____
_____	____°	____'	____"	____°	____'	____"	_____
_____	____°	____'	____"	____°	____'	____"	_____

☐ This permit establishes effluent limitations in the form of implemented BMPs identified in the associated E&S Plan, Reclamation Plan and NPDES application for this permit. These BMPs restrict the rates and quantities of associated pollutants from being discharged into surface waters of the Commonwealth.

The following BMPs apply:

☐ The following limits apply to the mine drainage treatment facility outfalls discharging to _____.
Outfalls:

DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
Discharge Parameter	**Minimum**	**Average Monthly**	**Maximum Daily**	**Instantaneous Maximum**	**Measurement Frequency* (minimum)**	**Sample Type**
pH (S.U.)	6.0	N/A	N/A	9.0	2/Month	Grab
Total Suspended Solids (mg/L)	N/A	35.0	70.0	90.0	2/Month	Grab
Iron, Total (mg/L)	N/A	1.5	3.0	3.7	2/Month	Grab
Manganese, Total (mg/L)	N/A	1.0	2.0	2.5	2/Month	Grab
Aluminum, Total (mg/L)	N/A	0.75	1.5	1.8	2/Month	Grab
Net Alkalinity (as $CaCO_3$, mg/L)	0.0	N/A	N/A	N/A	2/Month	Grab
Alkalinity, Total (as $CaCO_3$, mg/L)			Report		2/Month	Grab
Acidity, Total (as $CaCO_3$, mg/L)			Report		2/Month	Grab
Flow (gpm)			Report		2/Month	Measured
Temperature (°C)			Report		2/Month	Measured
Specific Conductance (µmhos/cm)			Report		2/Month	Grab
Sulfate, Total (mg/L)			Report		2/Month	Grab

** The measurement frequency the minimum number of sampling events required. Permittees are encouraged to obtain more than the minimum number of sampling events, which provides a better demonstration of compliance,*

Effluent Characterization Sampling Requirement

The permittee shall provide analysis of samples collected from the mine drainage treatment outfalls no later than two years after the initial discharge of each facility in compliance with 40 CFR 122.21(k)(5)(vi). Specifically, sampling results are required for the pollutants listed in 40 CFR 122, Appendix D, Table III (Report all), and for Appendix D Tables II and IV for those that are expected to be present. This quantitative data requirement is subject to the small business exemption at 40CFR 122.21(g)(8) for Table II.

Section B. STORMWATER CONTROL FACILITIES

☐ There are no point source discharges of this type at this site.

Outfall No.	Latitude			Longitude			To
001	40°	33'	02"	79°	09'	01"	UNT to Yellow Creek
002	40°	33'	05"	79°	09'	02"	UNT to Yellow Creek
003	40°	32'	49"	79°	09'	11"	UNT to Yellow Creek
004	40°	32'	57"	79°	08'	45"	UNT to Yellow Creek

☐ This permit establishes effluent limitations in the form of implemented BMPs identified in the associated E&S Plan, Reclamation Plan and NPDES application for this permit. These BMPs restrict the rates and quantities of associated pollutants from being discharged into surface waters of the Commonwealth.

The following BMPs apply:

☒ The following limits apply to all discharges from stormwater facilities discharging to **unnamed tributaries to Yellow Creeek**.
Outfalls: **001, 002, 003 and 004**

DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
Discharge Parameter	**Minimum**	**Average Monthly**	**Maximum Daily**	**Instantaneous Maximum**	**Measurement Frequency* (minimum)**	**Sample Type**
pH (S.U.)	6.0	N/A	N/A	9.0	2/Month	Grab
Total Suspended Solids (mg/L)	N/A	35.0	70.0	90.0	2/Month	Grab
Iron, Total (mg/L)	N/A	1.5	3.0	3.7	2/Month	Grab
Manganese, Total (mg/L)	N/A	1.0	2.0	2.5	2/Month	Grab
Aluminum, Total (mg/L)	N/A	0.75	1.5	1.8	2/Month	Grab
Net Alkalinity (as $CaCO_3$, mg/L)	0.0	N/A	N/A	N/A	2/Month	Grab
Alkalinity, Total (as $CaCO_3$, mg/L)	Report				2/Month	Grab
Acidity, Total (as $CaCO_3$, mg/L)	Report				2/Month	Grab
Flow (gpm)	Report				2/Month	Measured
Temperature (°C)	Report				2/Month	Measured

Specific Conductance (µmhos/cm)	Report	2/Month	Grab
Sulfate, Total (mg/L)	Report	2/Month	Grab

Alternate Precipitation Limits for Stormwater Control Facilities

☐ The following alternate discharge limitations apply to discharges from stormwater facilities resulting from precipitation events.
Outfalls:

☒ The following limits are not applicable due to Water Quality Based Effluent Limits (WQBELs).
Outfalls: **001, 002, 003 and 004**

In response to precipitation events LESS THAN OR EQUAL TO the 10-year/24-hour precipitation event.

DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
Discharge Parameter	**Minimum**	**Average Monthly**	**Maximum Daily**	**Instantaneous Maximum**	**Measurement Frequency* (minimum)**	**Sample Type**
pH (S.U.)					2/Month	Grab
Total Settleable Solids (mL/L)					2/Month	Grab
Iron, Total (mg/L)					2/Month	Grab
Net Alkalinity (as $CaCO_3$, mg/L)					2/Month	Grab
Alkalinity, Total (as $CaCO_3$, mg/L)					2/Month	Grab
Acidity, Total (as $CaCO_3$, mg/L)					2/Month	Grab
Flow (gpm)					2/Month	Measured
Temperature (°C)					2/Month	Measured
Specific Conductance (µmhos/cm)					2/Month	Grab
Sulfate, Total (mg/L)					2/Month	Grab

In response to precipitation events GREATER THAN the 10-year/24-hour precipitation event.

Discharge Parameter	**Minimum**	**Average Monthly**	**Maximum Daily**	**Instantaneous Maximum**	**Measurement Frequency* (minimum)**	**Sample Type**
pH (S.U.)					2/Month	Grab
Net Alkalinity (as $CaCO_3$, mg/L)					2/Month	Grab
Alkalinity, Total (as $CaCO_3$, mg/L)					2/Month	Grab
Acidity, Total (as $CaCO_3$, mg/L)					2/Month	Grab

** The measurement frequency the minimum number of sampling events required. Permittees are encouraged to obtain more than the minimum number of sampling events, which provides a better demonstration of compliance,*

Section B Alternate Discharge Limits and monitoring requirements are subject to demonstration by the permittee that the discharge occurred only as a result of a precipitation event in accordance with 25 Pa. Code §§ 87.103, 88.93, 88.188, 88.293, 89.53, or 90.103.

The stormwater limitations in the tables above do not apply if the discharge from the facility is the result of a discharge or increase in the volume of a discharge caused by **precipitation within any 24-hour period in excess of the 10-year/24-hour precipitation** event. [25 Pa. Code §§ 87.102, 88.92, 88.197, 88.292, 89.52, 90.102.]

Effluent Characterization Sampling Requirement

The permittee shall provide analysis of samples collected from erosion and sedimentation control outfalls within two years of the initial discharge of each facility in compliance with 40 CFR 122.26(c)(1)(i)(G). Specifically, sampling results are required for the pollutants listed in 40 CFR 122, Appendix D, Table III (Report All), and for Appendix D, Tables II and IV for those that are expected to be present and pH, specific conductivity, temperature, alkalinity, acidity, iron, manganese, aluminum, sulfate, chloride, settleable solids, total dissolved solids, oil and grease, BOD5, COD, Kjeldahl nitrogen, and nitrate plus nitrite nitrogen. This quantitative data requirement is subject to the small business exemption at 40 CFR 122.21(g)(8) for Table II.

Additional Requirements for Sections A and B

(applicable to all outfalls, under all precipitation conditions)

1. Samples collected to comply with the monitoring requirements shall be taken while the facility is discharging at the outfall points listed above. The monitoring requirement frequencies apply to both continuous and non-continuous discharges; therefore, sampling is required in every month during which a discharge occurs. A monitoring report of "no discharge" should only be used to indicate that there was no discharge during the entire reporting period.

2. The discharger may not discharge floating materials, scum, sheen, or substances that result in deposits in the receiving water. Except as provided in the permit, the discharger may not discharge foam, oil, grease, or substances that produce an observable change in the color, taste, odor, or turbidity of the receiving water. [25 Pa. Code § 92.41(c)]

3. The permittee may not discharge substances in concentration or amounts sufficient to be inimical or harmful to the water uses to be protected or to human, animal, plant or aquatic life. [25 Pa. Code § 93.6(a)]

4. The permittee shall ensure that all effluent characterization data analysis includes detection limits that are less than or equal to the most stringent water quality criteria for each parameter (PA Code Title 25 Chapter 93.8c Table 5).

5. The permittee shall include a sample from the receiving stream to be analyzed for hardness as part of the effluent characterization for this site. The hardness sample must be collected from the receiving stream downstream of the outfall(s) during a discharge.

Mandated Standard Conditions for NPDES Permits

1. Definitions

The following definitions apply within this permit. Reference citations are given from sections of 40 CFR as noted which have been adopted by reference in 25 Pa. Code Chapter 92a.

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [122.41(m)(1)(i)]

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. [122.41(m)(1)(ii)]

(c) "Average monthly" discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. [122.2]

(d). "Maximum daily" discharge limitation means the highest allowable "daily discharge." [122.2]

(e) "Daily discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "Daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day. [122.2]

(f) "Average" refers to the use of an arithmetic mean, unless otherwise specified in this permit. [122.41(l)(4)(iii)]

(g) "Instantaneous Maximum" means the highest allowable discharge of a concentration or mass at any one time as measured by a grab sample. [92a.2]

(h) "Composite Sample" means a combination of individual samples obtained at regular intervals over a time period. Either the volume of each individual sample is proportional to discharge flow rates, or the sampling interval (for constant volume samples) is proportional to the flows rates, over the time period used to produce the composite.

The maximum time period between individual samples shall not exceed two hours, except that for wastes of a uniform nature the samples may be collected on a frequency of at least twice per working shift and shall be equally spaced over a 24-hour period (or over the operating day if flows are of a shorter duration).

(i) "Grab Sample" means an individual sample collected at a randomly-selected time over a period not to exceed 15 minutes.

(j) "Measured Flow" means any method of liquid volume measurement, the accuracy of which has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.

(k) "At Outfall XXX" means a sampling location in outfall line XXX below the last point at which wastes are added to outfall line XXX, or where otherwise specified.

(l) "Estimate" means to be based on a technical evaluation of the sources contributing to the discharge including, but not limited to pump capabilities, water meters and batch discharge volumes.

(m) "Toxic Pollutant" means any pollutant listed as toxic under Section 307(a)(1) of the Clean Water Act. [122.2]

(n) "Hazardous Substance" means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the Clean Water Act. [122.2]

(o) "Best Management Practices" ("BMPs") are activities, facilities, measures, or procedures used to protect and maintain the quality of waters, and existing and designated uses within this Commonwealth. BMPs include E&S Plans, Reclamation Plans, Storm Water Management Act Plans, and other treatment requirements, operating procedures, and practices to control project site runoff, spillage or leaks, and other drainage from the mining activity.

(p) "Erosion and Sediment Control Plan" ("E&S Plan") is a site-specific plan included with the mining permit or authorization application identifying BMPs to minimize accelerated erosion and sedimentation and which meets the requirements of 25 Pa. Code Chapter 102.

(q) "Point Source" means a discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, CAAP, CAFO, landfill leachate collection system, or vessel or other floating craft from which pollutants are or may be discharged. [25 Pa. Code 92a.2]

(r) "Operator" means a person or entity conducting mining activity that is covered by this permit. The operator name must match the "Permittee" in relation to their mining permit or exploration activity approval and also that of "Operator" in the associated mine operator's license.

(s) "Reclamation Plan" means approved documentation made part of a permit or exploration notice that describes how the permittee will restore the land surface as required by the appropriate regulations to meet an approved post-mining land use. This plan includes activities such backfilling, regrading, soil stabilization, and revegetation. Once the permittee completes the reclamation plan, reclamation bond(s) may be released for a permitted mine site.

(t) "Stormwater" means surface runoff and drainage resulting from precipitation events, including ice and snowmelt runoff. [122.26(b)(13)]

(u) "Dry weather flow" means the base flow or surface discharge from an area or treatment facility which occurs immediately prior to a precipitation event and which resumes 24 hours after the precipitation event ends. [25 Pa. Code §§ 87.1, 88.1, 89.1, and 90.1]

(v) "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [122.41(n)(1)]

2. <u>Standard Federal Conditions</u>

40 CFR Sections 122.41 and 122.42 require that the following conditions are applied to all permits.

(a) *Duty to comply.* [92a.41(a)(1) and 122.41(a)] The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

(2) The Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed $25,000 per day for each violation. Section 309(d) of the CWA, 33 U.S.C. § 1319(d), provides that any person who violates Section 301 of the CWA, 33 U.S.C. § 1311, or violates any permit condition or limitation in a permit issued pursuant to Section 402 of the CWA, 33 U.S.C. § 1342, shall be subject to a civil penalty payable to the United States of up to $25,000 per day for each violation, which, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990, as amended by the Debt Collection Improvement Act of 1996, and the subsequent Civil Monetary Penalty Inflation Adjustment Rule, 40 C.F.R. Part 19, was increased to $32,500 per day for each violation occurring on or after March 15, 2004, and $37,500 per day for each violation occurring on or after January 12, 2009. The Clean Water Act provides that any person who *negligently* violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than

$100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

(3) Any person may be assessed an administrative penalty by the Administrator for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

(b) *Duty to reapply.* [92a.41(a)(2) and 122.41(b)] If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.

(c) *Need to halt or reduce activity not a defense.* [92a.41(a)(3) and 122.41(c)] It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(d) *Duty to mitigate.* [92a.41(a)(4) and 122.41(d)] The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(e) *Proper operation and maintenance.* [92a.41(a)(5) and 122.41(e)] The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

(f) *Permit actions.* [92a.41(a)(6) and 122.41(f)] This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

(g) *Property rights.* [92a.41(a)(7) and 122.41(g)] This permit does not convey any property rights of any sort, or any exclusive privilege.

(h) *Duty to provide information.* [92a.41(a)(8) and 122.41(h)] The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

(i) *Inspection and entry.* [92a.41(a)(9) and 122.41(i)] The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department or EPA), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

(4) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

(j) *Monitoring and records.* [92a.41(a)(10) and 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

(2) Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.

(3) Records of monitoring information shall include:

(i) The date, exact place, and time of sampling or measurements;
(ii) The individual(s) who performed the sampling or measurements;
(iii) The date(s) analyses were performed;
(iv) The individual(s) who performed the analyses;
(v) The analytical techniques or methods used, including detection limits; and
(vi) The results of such analyses.

(4) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136 unless another method is required under 40 CFR subchapters N or O.

(5) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

(k) *Signatory requirement.* [92a.41(a)(11) and 122.41(k)]

(1) All applications, reports, or information submitted to the Department shall be signed and certified. (See § 122.22)

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(l) *Reporting requirements* [92a.41(a)(12) and 122.41(l)]

(1) *Planned changes.* The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(i) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in § 122.29(b); or

(ii) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under § 122.42(a)(1).

(iii) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are

different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;

(2) *Anticipated noncompliance.* The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(3) *Transfers.* This permit is not transferable to any person except after notice to the Department. The Department may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Clean Water Act. (See § 122.61; in some cases, modification or revocation and reissuance is mandatory.)

(4) *Monitoring reports.* Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(i) Monitoring results must be reported on a DMR or forms provided or specified by the Department for reporting results of monitoring of sludge use or disposal practices.

(ii) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Department.

(iii) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Department in the permit.

(iv) Monitoring results obtained each month shall be summarized for that month and reported on a DMR.

(v) The DMR shall be submitted quarterly within 28 days after the end of the quarter to the appropriate District Mining Office.

(vi) *Electronic Reporting* The permittee shall use DEP's electronic Discharge Monitoring Report (eDMR) system to report the results of compliance monitoring under this permit. (25 Pa. Code §§ 92a.3(c), 92a.41(a), 92a.61(g) and 40 CFR § 122.41(l)(4)).

(5) *Compliance schedules.* Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(6) *Twenty-four hour reporting.*

(i) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(ii) The following shall be included as information which must be reported within 24 hours under this paragraph.

(A) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See § 122.44(g)).

(B) Any upset which exceeds any effluent limitation in the permit.

(C) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit to be reported within 24 hours. (See § 122.44(g).)

(iii) The Department may waive the written report on a case-by-case basis for reports under paragraph (l)(6)(ii) of this section if the oral report has been received within 24 hours.

(7) *Other noncompliance.* The permittee shall report all instances of noncompliance not reported under paragraphs (l) (4), (5), and (6) of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (l)(6) of this section.

(8) *Other information.* Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

(m) *Bypass* [92a.41(m) and 122.41(a)(13)]

(1) *Bypass not exceeding limitations.* The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (m)(2) and (m)(3) of this section.

(2) *Notice* —

(i) *Anticipated bypass.* If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible, at least ten days before the date of the bypass.

(ii) *Unanticipated bypass.* The permittee shall submit notice of an unanticipated bypass as required in paragraph (l)(6) of this section (24-hour notice).

(3) *Prohibition of bypass.*

(i) Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:

(A) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(C) The permittee submitted notices as required under paragraph (m)(2) of this section.

(ii) The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three conditions listed above in paragraph (m)(3)(i) of this section.

(n) *Existing manufacturing, commercial, mining, and silvicultural dischargers.* [92a.42 and 122.42(a)]

In addition to the reporting requirements above, all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Department as soon as they know or have reason to believe:

(1) That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(i) One hundred micrograms per liter (100 µg/l);

(ii) Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;
(iii) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with § 122.21(g)(7); or
(iv) The level established by the Department in accordance with § 122.44(f).

(2) That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(i) Five hundred micrograms per liter (500 µg/l);
(ii) One milligram per liter (1 mg/l) for antimony;
(iii) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with § 122.21(g)(7).
(iv) The level established by the Department in accordance with § 122.44(f).

3. Standard State Conditions

(a) All discharges authorized by the NPDES permit shall be consistent with the terms and conditions of the permit; that facility expansions, production increases or process modifications which result in new or increased discharges of pollutants shall be reported by submission of a new application or, if the discharge does not violate effluent limitations specified in the NPDES permit, by submission to the Department of notice of the new or increased discharges of pollutants, that the discharge of any pollutant more frequently than or at a level in excess of that identified and authorized by the permit shall constitute a violation of the terms and conditions of the permit.

(b) The permittee must comply with applicable water quality standards, including the narrative standards found at 25 Pa. Code § 93.6.

(c) The permittee shall comply with the immediate oral notification requirements of 25 Pa. Code § 91.33 (relating to incidents causing or threatening pollution). Oral notification is required as soon as possible, but no later than 4 hours after the permittee becomes aware of the incident causing or threatening pollution. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the incident causing or threatening pollution. The written submission must conform to the requirements of 40 CFR 122.41(l)(6). [92a.41(b)]

4. Preparedness, Prevention and Contingency (PPC) Plans

(a) Persons subject to this permit shall maintain a Preparedness, Prevention and Contingency (PPC) plan.

(b) The permittee shall periodically review, update, and amend the PPC Plan at least once a year and whenever the information submitted in the plan is no longer accurate.

(c) The permit does not authorize the discharge of any polluting substances resulting from an on-site spill. Such spills shall be controlled through proper implementation of a PPC Plan.

(d) This permit does not authorize any discharge (stormwater or non-stormwater), which contains any pollutant that may cause or contribute to an impact on aquatic life or pose a substantial hazard to human health or the environment due to its quantity or concentration.

(e) Operator personnel shall conduct site compliance evaluations using the Annual Inspection Form at least once a year. All areas shall be visually inspected for evidence of, or the potential for pollutants entering the drainage system. Measures to reduce pollutant loading shall be evaluated to determine whether they are adequate and property implemented in accordance with the terms of this permit or whether additional control measures are needed. Stormwater management measures, E&S plan measures and other structural pollution prevention measures shall be observed to ensure that they are operating correctly. The PPC Plan shall be revised as needed within 15 days of such inspection with implementation of any changes occurring not more than 90 days after the inspection.

NPDES INDIVIDUAL PERMIT CONDITIONS

1. Operation and Maintenance of Erosion and Sedimentation Plan

   a. The permittee shall implement the erosion and sedimentation plan contained in Module 12 and approved under Surface Mining Permit Number 32950202.

   b. The permittee shall be responsible for the inspection, maintenance, and repair of the erosion and sedimentation control BMPs to ensure that the proposed system continues to function as designed until final bond release occurs for the mine site.

   c. All BMPs shall be inspected by the responsible entity on a regularly scheduled basis and, at minimum, once a quarter and after all major storm events (greater than 0.5 inch in 24 hours). A qualified representative of the operator must perform inspections of the facilities. The inspections shall determine the operational condition, safety, and the effectiveness of the BMP. Based on the inspection results, an inspection report shall generate a listing of maintenance needs or repairs required. The permittee shall keep a listing of the repairs needed and a schedule for corrective action. Corrective actions shall be performed within the schedule. Written records shall be kept of all inspections and maintenance work performed related to the discharge management facilities.

2. The permittee is responsible to renew this NPDES permit until such time that the area is stabilized and no further earth disturbance will occur.

3. If the operator must use flocculants to meet effluent criteria, these must be approved by the Department prior to their use.