

An Evaluation of Recent Allegations of Trace Metal Contamination At the McDermott and Ernest Mine Sites

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Introduction

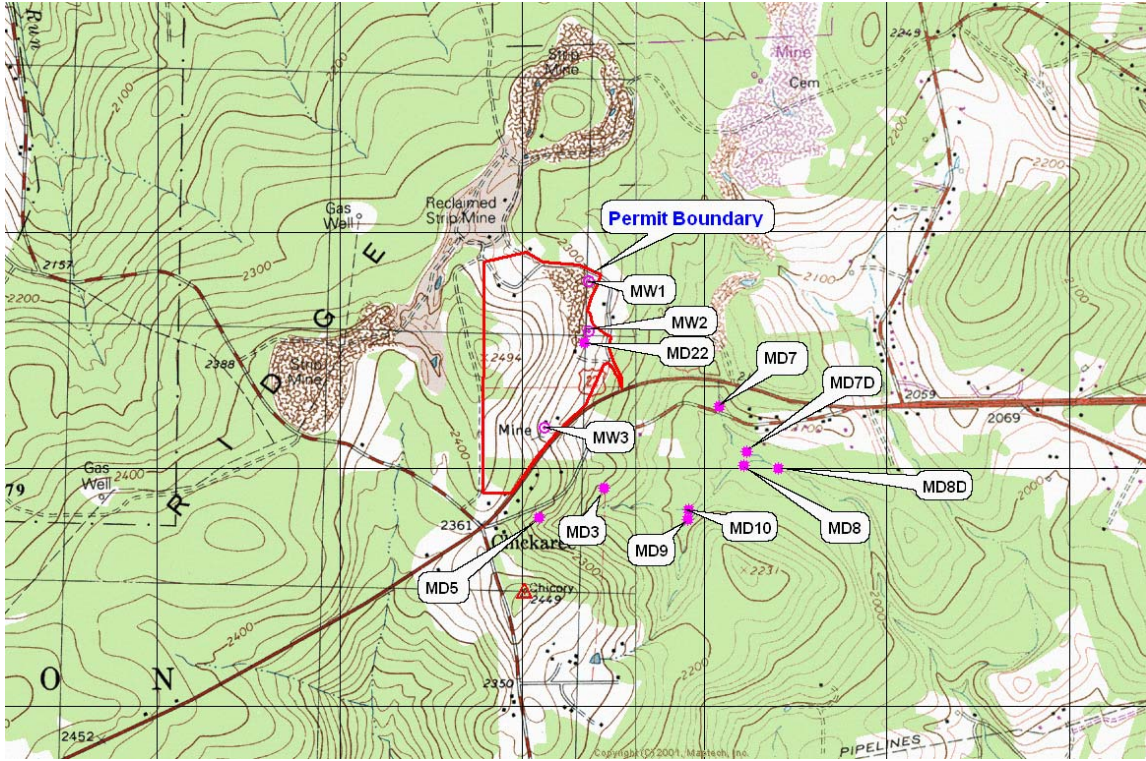
At a November 13, 2008 meeting at the Rachel Carson State Office Building Jeff Stant, representing Environmental Integrity Project, alleged trace metal contamination from coal ash at various mine sites in Pennsylvania, including the McDermott and Ernest sites. Mr. Stant demanded an immediate response from Department of Environmental Protection (DEP) staff. DEP staff present declined to respond without having had the opportunity to evaluate data pertinent to the allegations. The evaluation of the allegations is now completed for the McDermott and Ernest sites and the result follows. This response is limited to an analysis of the specific allegations made.

McDermott Site

The allegation here was one of off-site selenium (Se) contamination that exceeds aquatic-based sensitivity levels at monitoring point MD3. In evaluating the MD3 data it is first important to note that MD3 is not a stream or any other type of water body inherently capable of supporting aquatic life. Therefore, application of a criterion designed to protect aquatic uses is not appropriate. MD3 is a several-decades old, polluting, abandoned deep mine discharge that was documented to exist prior to the McDermott operation. Background data clearly establish the chemical nature of MD3, including that it typically has had a pH of less than 3.0 both before and after the McDermott operation.

The location of MD3 relative to the McDermott site is shown on Map 1 along with other relevant monitoring points that will be discussed in this evaluation. Map 1 is a reproduction of the Nanty Glo, PA 7.5 minute topographic map with the referenced monitoring points and site boundary added.

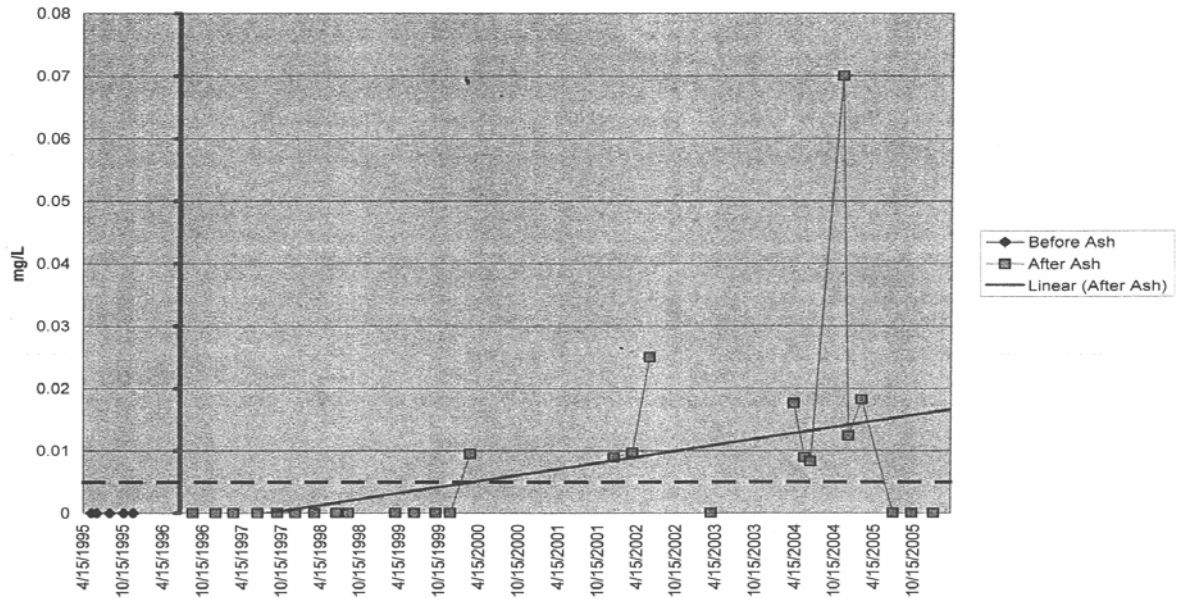
The information presented to support the allegation was a graph that included a portion of the available data from MD3; Graph 1 is a scanned copy of that document.



MAP 1

Graph 1

Selenium at MD-3, McDermott Mine Permit #11950102



The Se data at MD3 show that there were occurrences, mostly in the late 2002 to 2005 time frame, when the Se value at MD3 exceeded background levels. Over the past four years Se determinations have been mostly below the detection limit. Graph 1 includes only a portion of the available Se data up into early 2005 and does not include more recent data that help establish the return to background conditions. The coal operator that mined the McDermott site abandoned it early in 2003 leaving unreclaimed pits and coal ash open to weathering. Reclamation of the site began at the very end of 2005 under a contract between DEP and the insurer that had bonded the site. The cluster of data when Se levels at MD3 were above background seems to correspond to this period during which the site was not being maintained. These data do show Se levels during an approximate two-year period were elevated compared to background levels; however, these data do not support the allegations of contamination and a concern over an aquatic impact.

To be meaningful allegations of negative impacts must be tied to some concrete consequence. For example, used properly the concept of aquatic impact should indicate that an established aquatic life-based water quality standard for a stream is being violated *in that stream* or that biological surveys have demonstrated a negative impact. Contamination also should mean that some real standard such as a maximum contaminant level (MCL) in a water supply source or water quality standard in a stream has been violated. MCLs should never be applied as a contamination threshold to points that are not supplies, and in-stream standards should never be applied to sampling points that are not streams. The mere occurrence of a substance at detectable levels does not constitute contamination. It is also inappropriate to base claims of contamination, pollution or degradation on partial data sets, when examination of the entire data sets tells a different story.

There are much more Se data available at McDermott than those presented in Graph 1 that must be considered and discussed before an allegation of Se contamination can be either legitimately made or dismissed. Since the allegation here is an implied aquatic impact, an examination of in-stream Se determinations down gradient of the McDermott site is most appropriate. There are considerable such data available. These data were in the same file as the MD3 data, but apparently were not considered before the allegation of Se contamination was made. The available in-stream Se determinations at McDermott are included in the attached Table 1. These data show that 48 of the available 49 total Se determinations from stream samples collected downstream of the McDermott site are below the detection limit. Note that on the date that the one in-stream Se determination greater than the detection limit occurred another sample collected downstream showed a nondetect for Se. One occurrence above the detection limit out of 49 downstream Se determinations does not support an allegation of an aquatic impact, but soundly contradicts such an allegation.

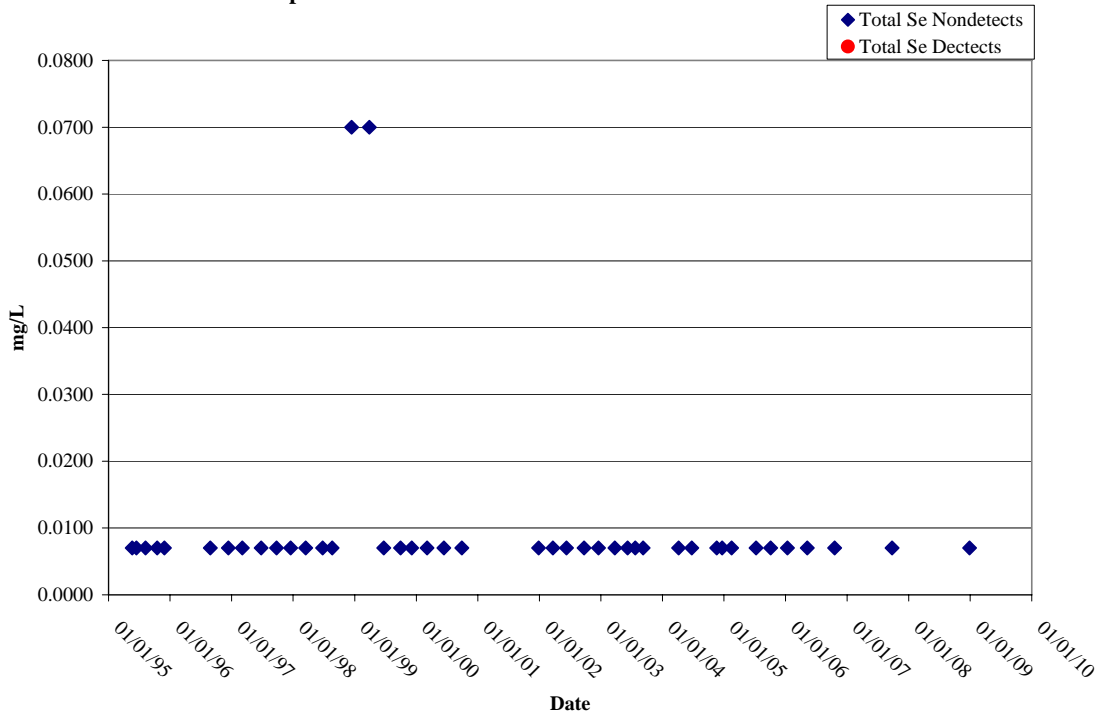
MD5 is the other off-site abandoned deep mine discharge monitored for the McDermott site. MD5 is believed to drain an area of deep mining on a seam mined on the McDermott site. The attached Graph 3 shows the available Se data for MD3. Every Se value is below the detection limit, including the two values shown at 70 ppb.

Table 1—In-stream Se Downstream of McDermott (mg/L)

Date	MD10	MD7	MD7D	MD8	MD8D
05/22/95				0.0070	
06/16/95		0.0070			
08/14/95		0.0070			
08/09/95				0.0070	
05/27/03			0.0070	0.0070	
07/15/03	0.0092		0.0070	0.0070	
04/07/04		0.0070	0.0070	0.0070	0.0070
05/27/04		0.0070	0.0070		
06/24/04		0.0070	0.0070	0.0070	
07/29/04		0.0070			
11/18/04		0.0070	0.0070	0.0070	
12/17/04		0.0070	0.0070	0.0070	
05/27/05		0.0070			
07/11/05		0.0070			
10/05/05		0.0070	0.0070	0.0070	
11/08/05		0.0070	0.0070	0.0070	
01/13/06			0.0070	0.0070	
05/10/06				0.0070	
10/19/06		0.0070			
04/23/07		0.0070			
09/26/07				0.0070	
12/29/08			0.0070	0.0070	

Values in **bold** are below detection.

Graph 3--Total Selenium Concentrations At McDermott MD5



The allegation of Se contamination at McDermott was based on a graph of data from one monitoring point (MD3) that included 32 data points. However, the file from which those data were derived included 64 Se determinations for MD3, 44 total determinations and 20 dissolved determinations. The file also included approximately 650 Se determinations collected from over 20 sampling points. The Se data offered to support the allegation of contamination makes up only 5% of the available Se data readily available from the site file. That approach to data evaluation will nearly always lead to incorrect conclusions.

If the other 95% of the Se data were considered before making an allegation of contamination, one must answer several pertinent questions before reaching such a conclusion: 1) Why are the Se concentrations in the three on-site monitoring wells with a proven hydrologic connection to the ash placement area nearly all nondetects? 2) Why were data collected from MD3 after mid 2005 not included in the graph used to support the allegation of an off-site aquatic impact? 3) Why is Se contamination not evident in the water that emanates from the site pit floor drain (MD22 data shown in Graph 4)? 4) If the site has produced off-site contamination above an aquatic sensitivity threshold, which was the specific allegation, why were stream data not considered and why are 48 of the available 49 in-stream Se determinations nondetects? 5) Why are all 63 of the available Se determinations from MD5, the other abandoned deep mine discharge monitored for the McDermott site, nondetects?

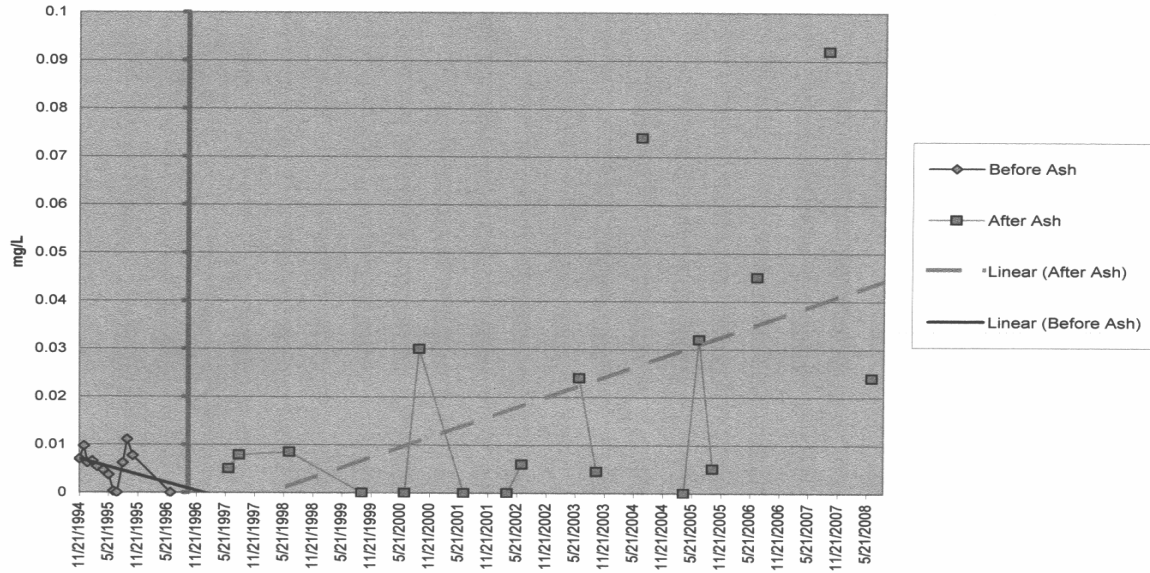
In conclusion, a thorough review of available Se data at McDermott show that the allegations of Se contamination and an aquatic threat at McDermott are not only unsupported by the data, they are contradicted by the data. Downstream monitoring data, the appropriate place to look for potential aquatic impacts, show that Se levels have consistently been below the DEP laboratory detection limit of 7 ppb. The data from the three on-site monitoring wells and from the largest backfill discharge also show Se mostly below detection limits, with only an occasional determination with single-digit to low-double digit ppb Se. The allegation was based on only a portion of the available data from an abandoned off-site acid mine drainage discharge and other pertinent data were not considered. Even if one ignores the large amount of Se data from points other than MD3, which obviously is not appropriate, the data from MD3 when viewed alone does not demonstrate an off-site aquatic threat, as was alleged.

Ernest Site

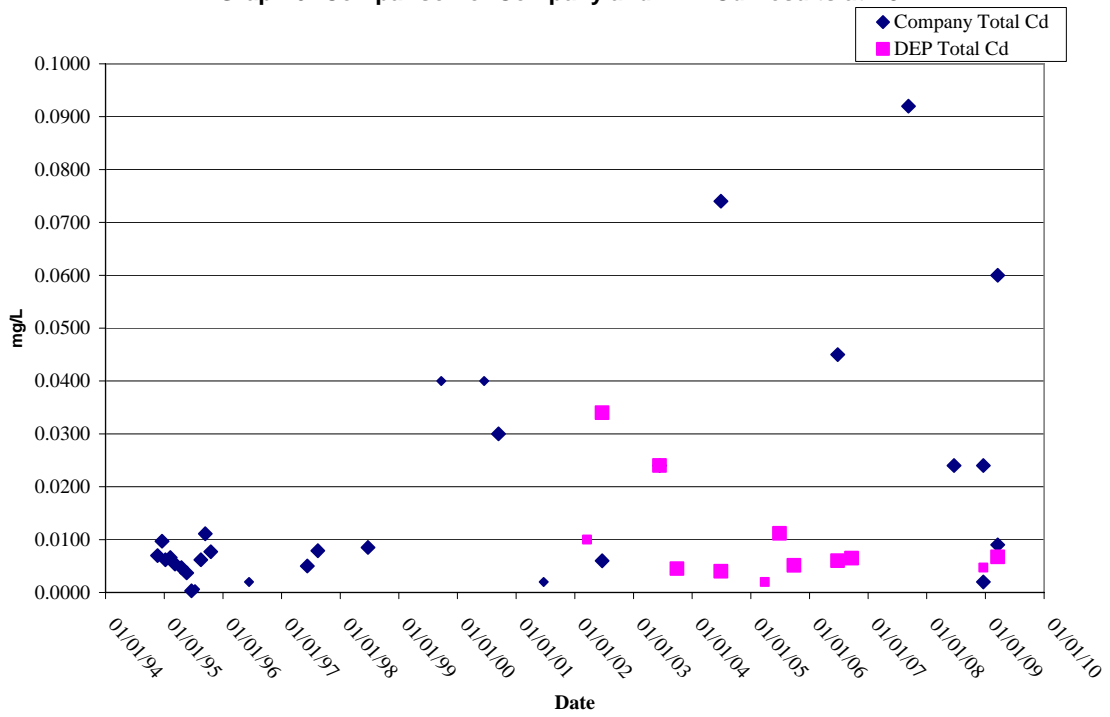
The claim expressed regarding the Ernest site was that the ash placement has led to cadmium (Cd) contamination at monitoring points E5 and MW1. The evidence presented for E5 was a graph which has been scanned and is labeled as Graph 5.

Graph 5

Cadmium at E-5, Ernest Mine Permit # 32950201



Graph 6--Comparison of Company and DEP Cd Results at E5



Graph 6 is a graph of all the available Cd data available at E5. A comparison between Graphs 5 and 6 shows that not all the available Cd data at E5 were considered in reaching the allegation that the data showed Cd contamination. With the exception of the data collected on December 19, 2008 and March 19, 2009, all of the data included on Graph 6 were available in the same file from which the data displayed in Graph 5 were obtained. On Graph 6 occurrences of Cd less than detection limits are denoted by smaller-sized symbols than the actual determinations. The data on Graph 6 show sampling conducted by the Department and sampling conducted by the mining company have not been producing comparable results for Cd. While the company data show that company-determined Cd levels have increased at E5, sampling conducted by the Department shows Cd remains at background levels. This contradiction raises legitimate questions, but it does not support an allegation of contamination, **and part of a data set should never be excluded from an evaluation.**

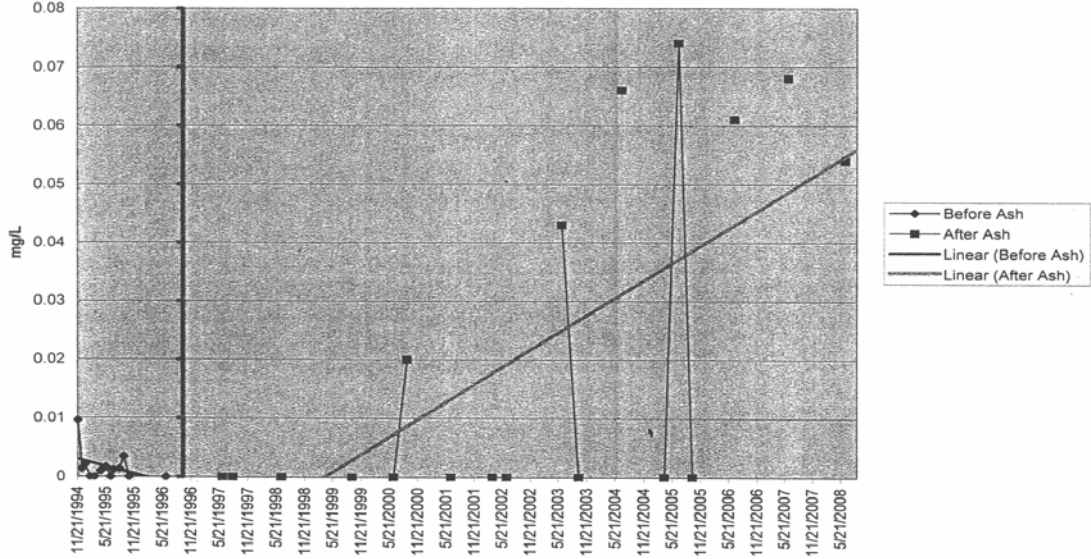
The data from E5 show that the abandoned coal refuse at the Ernest site leaches Cd at single-digit and low double-digit ppb levels; this conclusion is supported by the background data (pre-early 1996) that includes detectable Cd at those levels. The two occurrences of DEP Cd that are elevated relative to background (collected in late 2002 and early 2003) correspond with the time period when there was elevated acidity discharging at E5, likely due to disturbance of the abandoned refuse by the re-mining operation. Over the last five years the DEP Cd determinations are unchanged from the background data. Please note that two company-determined Cd values of 40 ppb reported in 1999 and 2000 are occurrences where the laboratory reported a detection limit of 40 ppb.

Graphs 7 and 8 show a pattern of Cd data for MW1 very similar to that for E5. Graph 7 is a scanned copy of the graph presented to support the allegation of Cd contamination at that point. Graph 8 shows that recent Department data are similar to background levels. The elevated Department data in 2002 and 2003 corresponds temporally to the similar occurrence in E5, which may be the result of the increased mine drainage (acidity) levels during that time period. Please note that two company-determined Cd values of 40 ppb reported in 1999 and 2000 are occurrences where the laboratory could only report a detection limit of 40 ppb. As with E5, the company Cd data and DEP Cd data from recent years are not comparable.

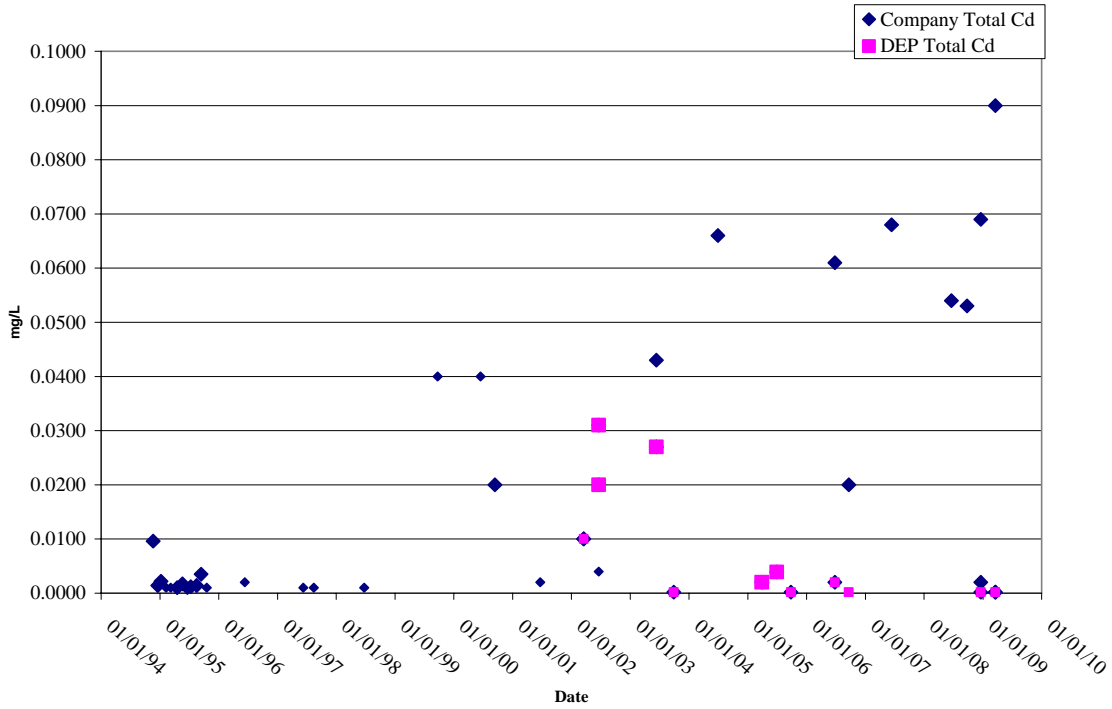
The Cd concentrations at the other Ernest downgradient monitoring point, well MW2, were not mentioned in the allegation of Cd contamination but were evaluated by DEP none-the-less. While Cd levels in MW2 are typically lower than in either MW1 or E5, the same general pattern applies. Recent DEP data are comparable to background; recent company data are not.

Graph 7

Cadmium at MW-1, Ernest Mine Permit # 32950201



Graph 8--Comparison of Company and DEP Cd Results at MW1



On December 19, 2008 and March 19, 2009 the Department conducted simultaneous sampling with Cambria Reclamation Corporation to help evaluate the discrepancy in the two entities' results. On both dates a third sample was simultaneously collected from each of the points and was sent to a third laboratory. The results of those three-way sampling events for E5 and MW1 are included on Graphs 7 and 8. For each sample point the DEP laboratory and the third private laboratory produced comparable Cd results on both dates, while the laboratory used by Cambria Reclamation produced much higher results. These two sampling events suggest that the elevated Cd in the company data for E5 and MW1 at Ernest may be related to sampling and/or analytical issues. For example the total Cd concentrations reported from MW1 for the March 19, 2009 three-way sampling event were as follows: company monitoring, 90.0 ppb; DEP lab, <0.2 ppb; third-party lab, <0.2 ppb.

In order to further define and understand the data additional future split sampling events will be conducted. Also, additional monitoring at new points and at an increased frequency will take place.

There are some other DEP data available from the Ernest site that cast further light on Cd occurrence at the site. The attached Table 2 includes data that the Department collected from E52 during 2005. E52 is a point through which most of the drainage from the abandoned coal refuse at the Ernest site flows; the water from E5 flows through point E52. The data for E52 are included in Table 2. As is typical for water leaching from abandoned bituminous coal refuse piles, the E52 water is severe mine drainage and includes detectable levels of some trace metals. However, note that the highest Cd level reported is 1.2 ppb, which is less than most of the background data from E5 and MW1.

During 2005 and 2006 the Department was able to collect samples of water that was runoff from partially reclaimed areas of ash placement at Ernest. This point is identified as "White Pipe" on sample sheets. Because of on-going site development, this point became more difficult to sample with time, but the Department was able to obtain a sample from it on March 19, 2009. While there was some coal refuse encapsulated in the ash up gradient of the White Pipe, the point was physically separate from the large mass of abandoned coal refuse. The results of available samples at the white pipe are shown in Table 2 along with the data from E52.

Because the White Pipe data is little influenced by the abandoned coal refuse, a comparison of the data from E52 and the White Pipe provides interesting and valuable insight to the differences between water running off of and leaching from abandoned coal refuse at Ernest and water running off of the FBC ash at Ernest. First, since Cd was the parameter of concern in the recent contamination allegation, it should be noted that each of the six Cd values collected over a period of two years of direct runoff from the ash placement area is less than the detection limit of 0.2 ppb.

In terms of its general character, the ash-associated water (White Pipe) has a somewhat elevated pH but modest alkalinity; potassium concentrations are very high when compared to E52, or other coal refuse leachate such as that found in E5. These elevated

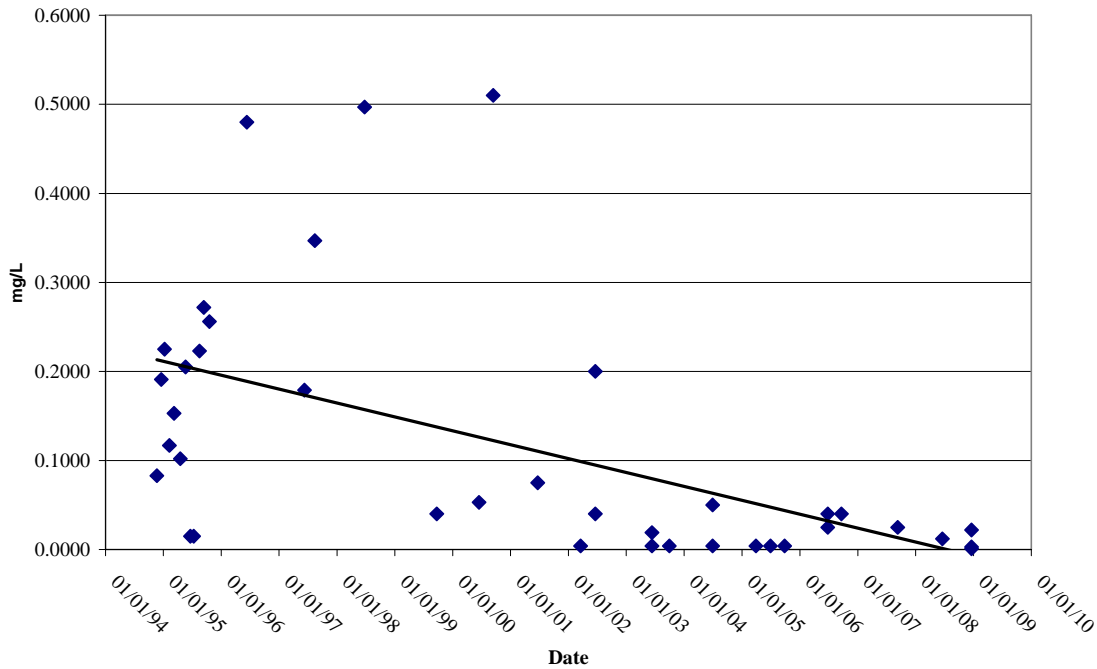
potassium levels in the high double digit to triple digit part per million (ppm) range seem to be characteristic of waters heavily influenced by FBC ash. This conclusion is based on observations of water quality from FBC ash derived from waste coal primarily from Cambria, Indiana and Somerset Counties, PA. It is important to note, however, that one cannot immediately assume that any sample showing elevated potassium levels owes its entire character to coal ash. As is always the case the interpreter of the data needs to place the sample result in the context from which the sample was collected, a critical and fundamental step that investigators of ash beneficial use sites often seem to overlook.

The Ca levels in both the acid mine drainage and the moderately alkaline ash water are both elevated and approximately the same. (Ca is generally not a good indicator parameter for FBC ash when it has been placed on a mine site because Ca levels are almost always elevated in mine drainage from Pennsylvania bituminous coal mines.) Magnesium levels are higher in the mine drainage water as compared to the ash runoff. Sulfate concentrations are elevated in the ash water, but not nearly as high as in the coal refuse runoff. The detectable levels of some trace metals, especially nickel, zinc, lead, and arsenic occur more frequently in the refuse water than in the ash water. The lone exception is Se. Five of the available seven Se levels from the White Pipe are nondetects and the other two are 7.1 and 13.1 ppb, while none of the samples from E52 show detectable Se. (The White Pipe is not aquatic habitat, and the levels and frequency of Se seen there does not constitute contamination.) The White Pipe water is clearly of a different character from the water that leaches from the abandoned coal refuse at Ernest, it is more heavily influenced by ash than refuse, and there has been no detectable Cd at that point.

DEP has also collected water samples for coal ash parameters from various other locations on the Ernest site over the past few years. Some of those samples show detectable Cd downgradient of areas where abandoned coal refuse has been recently disturbed.

It is possible for one parameter to change while all the others stay the same, but that is more the exception than the rule. For that reason and others it is not good practice to base allegations on examination of only one parameter. The E5 data from Ernest provide an interesting demonstration of that point. The attached Graph 9 includes all the available Arsenic (As) data from Ernest point E5. A simple trend line has been added. Compare Graph 9 to Graph 5.

Graph 9--Arsenic At E5



Applying the same interpretive rationale used to arrive at the allegation of that coal ash has led to Cd contamination, one would have to conclude that coal ash has led to an improvement in As concentrations at E5. However, at this point in the operation, that conclusion is not likely to be correct. The water quality at E5 is characteristic of leachate from abandoned coal refuse, and appears chemically unaffected to date by FBC ash. The abandoned coal refuse at the Ernest site leaches As. The Ernest operation has removed several million tons of abandoned coal refuse from the recharge area of E5; that is one factor that has likely contributed to the apparent decrease in As discharge from the site. Another factor that cannot be discounted is historic problems with the consistency of the data generated by the company monitoring at this site. Graph 9 includes both company and DEP data, but the background data (pre-mid 1996) are all company data. The factors that cause an objective evaluator of the data to not assume a cause-and-affect relationship between ash placement and an As decline at E5 do not allow an objective evaluator to assume such a relationship between Cd levels and ash placement at the site.

The comparison of the E5 data for Cd and As demonstrates why one should not choose only one parameter to represent a sampling point. Such an approach opens up very appropriate questions such as: 1) How and why was Cd chosen as the lone representative parameter? 2) Was the As data examined prior to the allegation of contamination, and, if so, would not a fair evaluation include an acknowledgement of the As data and consideration of why the company data for the two parameters trend in opposite directions?

Given these considerations, the available data do not support the allegation that there is historic or on-going Cd contamination from ash placement at the Ernest site. The allegation can only be made by not considering the data collected by DEP. It is never valid to base an allegation on only a portion of a data set. A comparison between company data and DEP data show a clear discrepancy between DEP data and company data.

Background sampling shows that the abandoned coal refuse at Ernest has the ability to leach Cd in the single digit to low double digit ppb range. Sampling conducted by DEP at points affected by recently-disturbed coal refuse shows detectable Cd in some cases. However, a discharge affected by the ash placement area, when sampled by DEP, consistently had a Cd concentration less than the detection limit of 0.2 ppb. Two three-way sample events showed that the laboratory used by the company for their recent monitoring did not produce Cd data comparable to DEP and a third lab. These factors strongly suggest that the elevated Cd seen in the company monitoring data have an explanation other than ash placement. Further testing and evaluation is underway that should reveal the reasons for the discrepancy between the company Cd data and DEP Cd data.

Conclusion

A thorough review of the monitoring data from the McDermott and Ernest sites reveals that the allegations concerning Se at McDermott and Cd at Ernest are not valid. Se data at McDermott do not support the allegation that the site has led to off-site Se levels that threaten aquatic resources; in fact the data strongly contradict that conclusion. The allegation of Cd contamination was made excluding DEP-collected data from the evaluation. The data do reveal a discrepancy between monitoring results produced by the permittee and those produced by DEP. A further evaluation of that discrepancy is underway and thus far suggests sampling and/or analytical reasons behind the discrepancy.

TABLE 2
E52 AND THE WHITE PIPE

Table 2. Water quality data for the "White Pipe" and E52 at the Ernest Mine Site																																					
WHITE PIPE																																					
Date	Flow (GPM) or Static Water	Field pH (Standard Units)	Lab pH (Standard Units)	Specific Conductivity (umhos/cm)	Alkalinity (mg/L)	Acidity (mg/L)	Dissolved Iron (mg/L)	Total Iron (mg/L)	Dissolved Mn (mg/L)	Total Mn (mg/L)	Dissolved Al (mg/L)	Total Al (mg/L)	SO4 (mg/L)	Fluoride (mg/L)	Chloride (mg/L)	Dissolved Sodium (mg/L)	Total Sodium (mg/L)	Dissolved Potassium (mg/L)	Total Potassium (mg/L)	TDS (mg/L)	TSS (mg/L)	Ammonia Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	Bicarbonate (mg/L)	Turbidity (NTU)	Chemical Oxygen Demand (mg/L)	Dissolved Ag (mg/L)	Total Ag (mg/L)	Dissolved As (mg/L)	Total As (mg/L)	Dissolved B (mg/L)	Total B (mg/L)	Dissolved Ba (mg/L)	Total Ba (mg/L)			
06/30/05	20.0		7.50	1971	39.8	-29.6		0.02		0.010	0.433	0.200	1090		22.80		21.80		133.00	1816	2.0																
07/28/05			7.60	2070	50.0	-30.6		0.04		0.010		0.200			23.90		155.00		1924	10.0																	
10/26/05			7.10	1559	75.6	-49.2		0.02		0.010		0.200	943		14.90		21.10		125.00	1752	6.0																
01/30/06			7.00	1345	37.2	-24.6		0.02		0.010		0.200	667		15.70		16.00		81.20	1124	12.0																
02/22/06			7.20	1745	32.6	-21.6		0.02		0.010		0.200	930		21.10		20.60		109.00	1500	6.0																
06/28/06			7.20	1583	39.0	-35.0		1.03		0.010		0.200	787				18.50		108.00	1386	2.0																
03/19/09			6.90	1233	34.4	-20.0	0.02	0.02	0.01	0.010	0.200	0.200	647			13.29	13.02	67.57	68.20	1072	5.0						0.010	0.010	0.0030	0.0030	0.2000	0.2000	0.010	0.010			
Date	Dissolved Be (mg/l)	Total Be (mg/l)	Dissolved Cd (mg/L)	Total Cd (mg/L)	Dissolved Ca (mg/L)	Total Ca (mg/L)	Dissolved Co (mg/L)	Total Co (mg/L)	Dissolved Cr (mg/L)	Total Cr (mg/L)	Dissolved Cu (mg/L)	Total Cu (mg/L)	Dissolved Hg (mg/L)	Total Hg (mg/L)	Dissolved Mg (mg/L)	Total Mg (mg/L)	Dissolved Mo (mg/l)	Total Mo (mg/l)	Dissolved Ni (mg/L)	Total Ni (mg/L)	Dissolved Pb (mg/L)	Total Pb (mg/L)	Dissolved Sb (mg/L)	Total Sb (mg/L)	Dissolved Se (mg/L)	Total Se (mg/L)	Dissolved Tl (mg/l)	Total Tl (mg/l)	Dissolved V (mg/l)	Total V (mg/l)	Dissolved Zn (mg/L)	Total Zn (mg/L)					
06/30/05			0.0002	0.0002	356.00	344.00			0.0500	0.0500	0.018	0.010	0.0010	0.0010	4.61	4.52		0.0500	0.0500	0.0010	0.0010				0.0075	0.0071					0.010	0.010					
07/28/05			0.0002	0.0002		401.00			0.0500	0.0500		0.010	0.0010	0.0010		4.04		0.0500	0.0500	0.0010	0.0010					0.0070						0.070	0.070				
10/26/05			0.0002	0.0002		310.00			0.0500	0.0500		0.001	0.0010	0.0010		9.53		0.0500	0.0500	0.0010	0.0010					0.0131						0.010	0.010				
01/30/06			0.0002	0.0002		233.00			0.0500	0.0500		0.010	0.0010	0.0010		12.10		0.0500	0.0500	0.0010	0.0010					0.0070						0.010	0.010				
02/22/06			0.0002	0.0002		309.00			0.0500	0.0500		0.010	0.0010	0.0010		9.13		0.0100	0.0100	0.0010	0.0010					0.0070						0.010	0.010				
06/28/06			0.0002	0.0002		299.00			0.0500	0.0500		0.010	0.0010	0.0010		5.78		0.0500	0.0500	0.0010	0.0010					0.0140						0.010	0.010				
03/19/09	0.001	0.001	0.0020	0.0002	216.00	216.00	0.05	0.05	0.0500	0.0500	0.010	0.010	0.0010	0.0010	9.86	9.51	0.07	0.07	0.0500	0.0500	0.0010	0.0010	0.002	0.002	0.0070	0.0070	0.0020	0.0020	0.020	0.020	0.010	0.010					
E52																																					
Date	Flow (GPM) or Static Water	Field pH (Standard Units)	Lab pH (Standard Units)	Specific Conductivity (umhos/cm)	Alkalinity (mg/L)	Acidity (mg/L)	Dissolved Iron (mg/L)	Total Iron (mg/L)	Dissolved Mn (mg/L)	Total Mn (mg/L)	Dissolved Al (mg/L)	Total Al (mg/L)	SO4 (mg/L)	Fluoride (mg/L)	Chloride (mg/L)	Dissolved Sodium (mg/L)	Total Sodium (mg/L)	Dissolved Potassium (mg/L)	Total Potassium (mg/L)	TDS (mg/L)	TSS (mg/L)	Ammonia Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	Bicarbonate (mg/L)	Turbidity (NTU)	Chemical Oxygen Demand (mg/L)	Dissolved Ag (mg/L)	Total Ag (mg/L)	Dissolved As (mg/L)	Total As (mg/L)	Dissolved B (mg/L)	Total B (mg/L)	Dissolved Ba (mg/L)	Total Ba (mg/L)			
03/20/05			3.40	965	0.0	339.8		74.90		1.48		29.70	461		6.60		4.74		2.79	868	4.0																
09/27/05			3.10	4520	0.0	2516.0		628.00		32.70	209.00	228.00	3608		14.70		20.20		10.88	6712	32.0								0.0040								
09/28/05			3.10	4750	0.0	2782.8				33.80		274.00	3640		12.50		16.10		11.50	7104	34.0																
10/26/05	6.1		3.70	1504	0.0	540.0		128.00		7.71		56.30	1072		4.00		4.70		3.10	1708	2.0																
Date	Dissolved Be (mg/l)	Total Be (mg/l)	Dissolved Cd (mg/L)	Total Cd (mg/L)	Dissolved Ca (mg/L)	Total Ca (mg/L)	Dissolved Co (mg/L)	Total Co (mg/L)	Dissolved Cr (mg/L)	Total Cr (mg/L)	Dissolved Cu (mg/L)	Total Cu (mg/L)	Dissolved Hg (mg/L)	Total Hg (mg/L)	Dissolved Mg (mg/L)	Total Mg (mg/L)	Dissolved Mo (mg/l)	Total Mo (mg/l)	Dissolved Ni (mg/L)	Total Ni (mg/L)	Dissolved Pb (mg/L)	Total Pb (mg/L)	Dissolved Sb (mg/L)	Total Sb (mg/L)	Dissolved Se (mg/L)	Total Se (mg/L)	Dissolved Tl (mg/l)	Total Tl (mg/l)	Dissolved V (mg/l)	Total V (mg/l)	Dissolved Zn (mg/L)	Total Zn (mg/L)					
03/30/05			0.0002	0.0002					0.0500	0.010	0.010	0.010	0.0010	0.0010		12.00			0.134	0.0010	0.0010					0.0070							0.339				
09/27/05			0.0002	0.0002	376.00	409.00			0.0500	0.010	0.010	0.010	0.0010	0.0010	136.00	147.00			1.099	1.175	0.0066	0.0067			0.0070	0.0070					2.390	2.540					
09/28/05			0.0002	0.0002		442.00			0.0500	0.010	0.010	0.010	0.0010	0.0010	165.00	165.00				1.160	0.0079	0.0079			0.0070	0.0070						2.720	2.720				
10/26/05				0.0014		134.00				0.0500	0.010	0.010	0.0010	0.0010		44.00				0.091	0.0015	0.0015			0.0070	0.0070						0.727					

Numbers in bold are below detector

Numbers in bold print denote values =< the detection limit.