No. 17-1498

In the Supreme Court of the United States

ATLANTIC RICHFIELD COMPANY, PETITIONER

v.

GREGORY A. CHRISTIAN, ET AL., RESPONDENTS

ON WRIT OF CERTIORARI
TO THE SUPREME COURT OF MONTANA

JOINT APPENDIX

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PETITION FOR A WRIT OF CERTIORARI FILED: APRIL 27, 2018
CERTIORARI GRANTED: JUNE 10, 2019

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NOTICE

The following items have been omitted in printing the joint appendix because they appear as appendices to the petition for certiorari as follows:

MONTANA SUPREME COURT

Docket No. OP 16-0555

ATLANTIC RICHFIELD COMPANY,

v.

MONTANA SECOND JUDICIAL DISTRICT COURT, SILVER BOW COUNTY, THE HON. KATHERINE M. BIDEGARAY

RELEVANT DOCKET ENTRIES

DATE	PROCEEDINGS
09/21/2016	Petition - Writ - Supervisory Control
	* * *
10/05/2016	Order - this Court accepts jurisdiction for the limited purpose of considering the DC 8/30/16 Order; Atlantic's opening brief is due w/n 30 days. U.S. may file an amicus brief; further proceedings are STAYED; in all other respects the petition is DENIED.
10/11/2016	Petition - Rehearing. copies to Court.
10/17/2016	Response/Objection – Rehearing
	* * *
10/18/2016	Order - the petition for rehearing is DENIED; the petition shall be accepted as the summary response to the petition for writ; Atlantic Richfield's opening brief is due within 30 days.

DATE	PROCEEDINGS
11/16/2016	Motion - Opposed - Brief and Supporting Affidavit - Enlarged Amicus Brief - copies to Court with a copy of Lodged Amicus Brief
11/17/2016	Brief - Appellant's Opening
11/22/2016	Motion - Unopposed - Amicus - Leave to Participate (Montana Trial Lawyers Association) - sent to Court w/SC file
11/23/2016	Order - Amicus-Grant Participation of Montana Trial Lawyers. Brief shall be due concurrently with Respondent's Brief
11/23/2016	Motion - Unopposed - Amicus - Leave to Participate (Clark Fork Coalition) - sent to Court w/SC file
11/25/2016	Response/Objection - Response to Motion to file Enlarged Amicus Brief
	* * *
11/25/2016	Order - Amicus-Grant Participation (Clark Fork Coalition)
11/29/2016	Order - Denying Motion to file Enlarged Amicus Brief
12/05/2016	Motion - Unopposed - Amicus - Leave to Participate (Montana Environmental Information Center) -sent to Court w/SC file
12/06/2016	Order - MEIC is granted leave to file an amicus curiae brief in this matter which shall be due concurrently with that of the Respondent.

DATE	PROCEEDINGS
12/09/2016	Brief - Amicus (USA)
12/19/2016	Brief - Amicus - (Clark Fork Coalition).
12/19/2016	Brief - Amicus (Montana Trial Lawyers Association and Montana Environmental Information Center)
12/19/2016	Brief - Plaintiffs/Counter-Petitioners' Answer Brief.
	* * *
12/21/2016	Motion - Unopposed - Extension of Time - Reply Brief (sent to court)
12/21/2016	Order - Grant - Extension of Time - Petitioner is granted until 2/2/17 to file the reply brief.
02/03/2017	Brief - Appellant Reply
	* * *
02/15/2017	Order - Classified - Oral Argument - Friday, 4/7/17 at 9:30 a.m., introduction at 9:00 a.m.; Hon. James A. Manley will participate in the place of Chief Justice McGrath, who has recused himself.
	* * *
02/23/2017	Order - Hon. John A. Kutzman called to participate in place of Justice Rice in 4/7/17 Oral Argument
03/13/2017	Motion - Unopposed - Oral Argument - Leave to Participate (Amicus Curiae United States)
	* * *

DATE	PROCEEDINGS
03/14/2017	Order - Granting Amicus United States leave to participate in oral argument
03/17/2017	Motion - Unopposed - Oral Argument - Leave to Participate
03/17/2017	Order - Grant - Motion of Amicus Montana Trial Lawyers Association to participate in oral argument is GRANTED. Respondent and Amicus are free to divide their time as they see fit, but the total amount of time between them shall not exceed 30 minutes
	* * *
04/07/2017	Event - Oral Argument Presented by Jonathan Rauchway for the petitioner and Matthew Oakes, Department of Justice, Amicus. Respondent argument presented by Justin Stalpes and Domenic Cossi, Montana Trial Lawyers Association, Amicus. The matter was taken under advisement at 10:40 a.m..
	* * *
12/29/2017	Opinion - Opinion and Order - Justice Shea; the district court's orders on summary judgment are AFFIRMED; the matter is remanded for further proceedings.
12/29/2017	Opinion - Synopsis of Opinion

BUTTE-SILVER BOW COUNTY DISTRICT COURT

Case Register Report
DV-47-2008-0000173-NE

GREGORY A CHRISTIAN, *et al.*,

v.

BP AMOCO CORPORATION, *et al.*

RELEVANT DOCKET ENTRIES

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
1.000	4/17/2008	04/17/2008	Complaint and Jury Demand Filed no Summons Issued Newman, Brad
2.000	07/10/2008	07/10/2008	Amended Complaint and Jury Demand/ (24) Summons Issued Newman, Brad
		* * *	
4.000	07/31/2008	07/31/2008	Notice to Clerk of Court of Removal to Federal Court (Atlantic Richfield Company) Newman, Brad

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
		* * *	
19.000	12/17/2008	12/09/2008	Order (Granting Remand to District Court) (Filed in Federal Court) Newman, Brad
		* * *	
56.000	07/12/2011	07/11/2011	Motion for Leave to File Amended Complaint and Jury Demand and Supporting Memorandum (original received 7/12/11) Newman, Brad
57.000	07/14/2011	07/14/2011	Order Granting Leave to File Amended Complaint and Jury Demand Newman, Brad
		* * *	
59.000	08/03/2011	08/03/2011	Second Amended Complaint and Jury Demand Newman, Brad
		* * *	

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
65.000	08/19/2011	08/19/2011	Atlantic Richfield Company's Answer to Second Amended Complaint and Jury Demand Newman, Brad
		* * *	
91.000	10/15/2012	10/12/2012	Stipulation to Allow Amendment of Complaint Newman, Brad
		* * *	
94.000	10/15/2012	10/12/2012	Order Allowing Amendment of Complaint Newman, Brad
		* * *	
140.000	12/24/2012	12/24/2012	Third Amended Complaint and Jury Demand (Order Entry #94) Newman, Brad
		* * *	
152.000	01/09/2013	01/09/2013	Altanic Richfield Company's Answer to Third Amended Complaint and Jury Demand Newman, Brad

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
		* * *	
214.000	04/15/2013	04/15/2013	Plaintiffs' Expert Witness Disclosure (Attachments not filed - exceed 25 pages and no Order to file)(Original 4/16/13)
			Newman, Brad
215.000	04/15/2013	04/15/2013	Defendants' Expert Witness Disclosure
			Newman, Brad
		* * *	
219.000	05/03/2013	05/03/2013	Atlantic Richfield Co. Motion for Summary Judgment on Plaintiffs' Negligence Claim
			Newman, Brad
220.000	05/03/2013	05/03/2013	Atlantic Richfield Co. Brief in Support of Motion for Judgment on Plaintiffs' Claim for Restoration Damages as Barred by Cercla
			Newman, Brad
		* * *	

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
226.000	05/20/2013	05/20/2013	Atlantic Richfield Company's Brief in Support of Motion for Summary Judgment on Plaintiffs' Claim for Restoration Damages as Barred by CERCLA (Attachments not scaanned) Newman, Brad
		* * *	
228.000	05/29/2013	05/29/2013	Plaintiffs' Brief in Opposition to Arco's Motion for Summary Judgment (Negligence) Newman, Brad
		* * *	
233.000	06/10/2013	06/10/2013	Plaintiffs' Motion for Summary Judgment on Arco's Cercla Preemption Affirmative Defenses (11th-13th) Newman, Brad
		* * *	

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
239.000	06/12/2013	06/12/2013	Plaintiffs' Brief in Opposition to Arco's Motion for Summary Judgment and In Support of Plaintiffs' Cross-Motion for Summary Judgment on Arco's Cercla Preemption Affirmative Defenses (11th-13th) Newman, Brad
240.000	06/14/2013	06/14/2013	Atlantic Richfield Company's Reply In Support Of Motion For Summary Judgment On Plaintiffs' Negligence Claim Newman, Brad
		* * *	
242.000	06/19/2013	06/19/2013	Defendants' Rebuttal Expert witness Disclosure Newman, Brad
		* * *	
249.000	06/28/2013	06/28/2013	Atlantic Richfield Company's Request for Oral Argument

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			on Pending Summary Judgment Motions Newman, Brad
		* * *	
254.000	07/02/2013	07/01/2013	Atlantic Richfield Company's Reply in Support of Motion for Summary Judgment on Plaintiffs' Claim for Restoration Damages as Barred by Cercla and Response to Plaintiffs' Cross Motion Newman, Brad
		* * *	
260.000	07/12/2013	07/12/2013	Atlantic Richfield Company's Motion for Summary Judgment on its Easement Rights. Newman, Brad
		* * *	
267.000	07/15/2013	07/15/2013	Atlantic Richfield Company's Brief in Support of Motion

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			for Summary Judgment on Its Easement Rights (Exhibits not Scanned)
			Newman, Brad
		* * *	
286.000	08/19/2013	08/19/2013	Atlantic Richfield Company's Reply Brief in Suport of Motion to Compel Production of Plaintiffs' Fee and Costs Agreements
			Newman, Brad
287.000	08/20/2013	08/19/2013	Plaintiffs' Brief in Response to ARCo's Motion for Summary Judgment Based on Claimed Easement Rights and In Support for Summary Judgment on ARCo's Third Affirmative Defense Re: Easements (Original replaced fax: 8/21/13)
			Newman, Brad

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
288.000	08/21/2013	08/21/13	Plaintiffs' Cross-Motion for Summary Judgement on ARCO's Third Affirmative Defense Newman, Brad
		* * *	
291.000	08/30/2013	08/30/2013	Atlantic Richfield Co. Motion for Summary Judgment on Plaintiffs' Unjust Enrichment, Constructive Fraud, Strict Liability, and Wrongful Occupation Claims. Newman, Brad
292.000	08/30/2013	08/30/2013	Atlantic Richfield Co.'s Brief in Support of Motion for Summary Judgment on Plaintiff's Unjust Enrichment, Constructive Fraud, Strict Liability, and Wrongful Occupation Claims. Newman, Brad

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
293.000	08/30/2013	08/30/2013	Defendants' Motion for Summary Judgment on all Claims Against all Defendants Other Than Atlantic Richfield Company Newman, Brad
294.000	08/30/2013	08/30/2013	294. Defendants' Brief in Support of Motion for Summary Judgment on all Claims Agains all Defendants Other Than Atlantic Richfield Company Newman, Brad
295.000	09/06/2013	09/06/2013	295. Atlantic Richfield Company's Reply in Support of Motion for Summary Judgment on its Easement Rights and Response to Plaintiffs' Cross-Motion Newman, Brad

* * *

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
299.000	09/12/2013	09/12/2013	Atlantic Richfield Company's Motion for Summary Judgment on Plaintiffs' Claim for Punitive Damages Newman, Brad
300.000	09/12/2013	09/12/2013	300. Altantic Richfield Company's Brief in Support of Motion for Summary Judgment on Plaintiffs' Claim for Punitive Damages Newman, Brad
301.000	09/12/2013	09/12/2013	301. Altantic Richfield Company's Motion for Summary Judgment on Plaintiffs' Surface and Ground Water Restoration Claims Based on Res Judicata and Release Newman, Brad
302.000	09/12/2013	09/12/2013	Atlantic Richfield Company's Brief in Support of Motion

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			for Summary Judgment on Plaintiffs' Surface and Ground Water Restoration Claims Based on Res Judicata and Release
			Newman, Brad
303.000	09/12/2013	09/12/2013	Atlantic Richfield Company's Motion for Summary Judgment on Plaintiffs' Claim for Restoration Damages
			Newman, Brad
304.000	09/12/2013	09/12/2013	Atlantic Richfield Company's Brief in Support of Motion for Summary Judgment on Plaintiffs' Claim for Restoration Damages
			Newman, Brad
305.000	09/12/2013	09/12/2013	305. Atlantic Richfield Company's Motion for Summary Judgment on Plaintiffs' Trespass & Nuisance Claims
			Newman, Brad

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
306.000	09/12/2013	09/12/2013	Atlantic Richfield Company's Brief in Support of Motion for Summary Judgment on Plaintiffs' Trespass & Nuisance Claims Newman, Brad
307.000	09/12/2013	09/12/2013	Atlantic Richfield Company's Motion For Summary Judgment On all of Plaintiffs' Claims As Barred By The Applicable Statutes of Limitations Newman, Brad
308.000	09/12/2013	09/12/2013	Atlantic Richfield Company's Brief In Support of Motion For Summary Judgment on all of Plaintiffs' Claims As Barred By the Applicable Statutes of Limitations Newman, Brad
309.000	09/13/2013	09/12/2013	Plaintiffs' Motion for Partial Summary Judgment (Affirmative Defenses)

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			(Original received: 9/16/13)
			Newman, Brad
310.000	09/13/2013	09/12/2013	Plaintiffs' Brief in Suppport of Motion for Partial Summary Judgment (Affirmative Defenses) (Original received: 9/16/13)
			Newman, Brad
311.000	09/13/2013	09/12/2013	Plaintiffs' Motion for Partial Summary Judgment (Liability) (Original received: 9/16/13)
			Newman, Brad
312.000	09/13/2013	09/12/2013	Plaintiffs' Brief in Suppport of Motion for Partial Summary Judgment (Liability) and Opposing ARCO's Motion for Summary Judgment (Strict Liability) (Original received: 9/16/13)
			Newman, Brad

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
		* * *	
320.000	09/18/2013	09/18/2013	Plaintiffs Second Supplemental Expert Witness Disclosure Newman, Brad
321.000	09/20/2013	09/20/2013	Plaintiff's Response to ARCO's Motion for Summary Judgment on all Claims Against all Defendants other than Atlantic Richfield Company Newman, Brad
		* * *	
327.000	09/24/2013	09/23/2013	327. Plaintiffs' Brief Opposing Atlantic Richfield Company's Motion for Summary Judgment (Wrongful Occupation, Constructive Fraud, Unjust Enrichment) (Original 9/25/13) Newman, Brad
328.000	09/24/2013	09/24/2013	Plaintiffs' Reply Brief in Support

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			Motion for Summary Judgment on Arco's Third Affirmative Defense (Pollution Easements) (Original 9/25/13)
			Newman, Brad
		* * *	
332.000	09/30/2013	09/30/2013	Atlantic Richfield Company's Response to Plaintiffs' Motion for Summary Judgment (Liability)
			Newman, Brad
333.000	09/30/2013	09/30/2013	Atlantic Richfield Conpany's Reply in Support of its Motion for Summary Judgment on Plaintiffs' Strict Liability Claim
			Newman, Brad
334.000	10/01/2013	10/01/2013	334. Defendants' Reply in Support of Unopposed Motion for Summary Judgment on All Claims Against All Defendants Other Than

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			Atlantic Richfield Company
			Newman, Brad
		* * *	
341.000	10/07/2013	10/07/2013	341. Atlantic Richfield Company's Opposition to Plaintiffs' Motion for Partial Summary Judgment (Affirmative Defenses)
			Newman, Brad
342.000	10/08/2013	10/07/2013	342. Plaintiffs' Brief Opposing ARCo's Motion for Summary Judgment (Res Judicata and Release) (Original replaced fax: 10/9/13)
			Newman, Brad
343.000	10/08/2013	10/07/2013	343. *Plaintiffs' Brief Opposing ARCo's Motion for Summary Judgment (Restoration Damages) (Original replaced fax: 10/9/13)
			Newman, Brad

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
344.000	10/08/2013	10/07/2013	344. Plaintiffs' Brief Opposing ARCo's Motion for Summary Judgment (Statute of Limitations) (Original replaced fax: 10/9/13) Newman, Brad
		* * *	
348.000	10/08/2013	0/08/2013	348. Plaintiffs' Response in Opposition to ARCO's Motion for Summary Judgment RE: Trespass & Nuisance Newman, Brad
349.000	10/08/2013	10/08/2013	349. Plaintiffs' Response Brief in Opposition to ARCO's Motion for Summary Judgment RE: Punitive Damages Newman, Brad
		* * *	
353.000	10/09/2013	10/09/2013	353. Order Concerning Defendant Atlantic Richfield's

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			Motion for Summary Judgment on all Claims Against Defendants Other Than Atlantic Richfield Newman, Brad
		* * *	
363.000	10/10/2013	10/10/2013	363. Plaintiffs' Motion in Limine (EPA Evidence) Newman, Brad
363.100	11/18/2013	11/18/2013	Plaintiffs' Brief in Support of Motion in Limine (EPA Evidence) Newman, Brad
		* * *	
387.000	10/11/2013	10/11/2013	387. Atlantic Richfield Company's Reply in Support of Motion for Summary Judgment on Plaintiffs' Constructive Fraud, Wrongful Occupation, & Unjust Enrichment Claims Newman, Brad

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
		* * *	
389.000	10/18/2013	10/18/2013	389. Plaintiffs Reply Brief In Support of Motion For Partial Summary Judgment (Liability) (Original 10/21/13) Newman, Brad
390.000	10/21/2013	10/21/2013	390. Atlantic Richfield Company's Reply in Support of Motion for Summary Judgment on Plaintiffs' Claim for Punitive Damages Newman, Brad
		* * *	
393.000	10/21/2013	10/21/2013	393. Atlantic Richfield Company's Reply in Support of Motion for Summary Judgment on Plaintiffs' Trespass and Nuisance Claims Newman, Brad
		* * *	

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
399.000	10/24/2013	10/24/2013	399. Atlantic Richfield Company's Reply Brief in Support of Motion for Summary Judgment on Plaintiffs' Claim for Restoration Damages Newman, Brad
400.000	10/24/2013	10/24/2013	400. Atlantic Richfield Company's Reply in Support of Motion for Summary Judgment on Plaintiffs' Surface and Ground Water Restoration Claims Based on Res Judicata and Release Newman, Brad
401.000	10/24/2013	10/24/2013	401. Atlantic Richfield Company's Reply in Support of Its Motion for Summary Judgment on All of Plaintiffs' Claims as Barred by

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			the Applicable Statutes of Limitations
			Newman, Brad
402.000	10/25/2013	10/24/2013	402. Plaintiff's Reply Brief in Support of Motion for Partial Summary Judgment (Affirmative Defenses) (Original 10/28/13)
			Newman, Brad
		* * *	
422.000	11/05/2013	11/04/2013	Atlantic Richfield Company's Response in Opposition to Plaintiffs' Motion in Limine (EPA Evidence)
			Newman, Brad
		* * *	
428.000	11/13/2013	11/12/2013	United States' Motion for Leave to file a Brief Amicus Curiae
			Newman, Brad
429.000	11/13/2013	11/12/2013	Brief of United States As Amicus Curiae in Support of Defendant

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			Atlantic Richfield Co.
			Newman, Brad
		* * *	
431.000	11/15/2013	11/14/2013	Plaintiffs' Brief Opposing the United States' Motion for Leave to File a Brief Amicus Curiae (Original replaced fax: 11/18/2013)
			Newman, Brad
		* * *	
442.000	11/21/2013	11/21/2013	Order Denying Motion of the United States for Leave to File an Amicus Curiae Brief
			Newman, Brad
		* * *	
452.000	11/22/2013	11/21/2013	Plaintiffs' Reply Brief in Support of Motion in Limine (EPA Evidence) (Original replaced fax: 11/25/13)
			Newman, Brad

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
		* * *	
461.000	12/17/2013	12/17/2013	Memorandum and Order Granting Defendant's Motion for Summary Judgment on all Plaintiffs' Claims as Barred by Applicable Statutes of Limitations Newman, Brad
		* * *	
465.000	12/23/2013	12/23/2013	Notice Of Entry of Judgment Newman, Brad
466.000	12/23/2013	12/23/2013	Memorandum and Order Granting Defendant's Motion For Summary Judgment on All Plaintiffs Claims As Barred By Applicable Stattes of Limitations Newman, Brad
		* * *	
468.000	01/10/2014	01/10/2014	Copy of Notice of Appeal (Filed at Supreme Court) Newman, Brad

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
476.000	09/22/2015	09/22/2015	Remittitur (Affirmed in part, reversed in pary, and remanded) Newman, Brad
		* * *	
479.000	09/25/2015	09/25/2015	Motion For Substitution of District Judge - ($100.00 paid by Plaintiffs) Newman, Brad
480.000	10/14/2015	10/14/2015	Order Newman, Brad
		* * *	
483.000	10/30/2015	10/30/2015	Motion for Substitution of Judge ($100.00 paid) Krueger, Kurt
		* * *	
486.000	11/25/2015	11/25/2015	Order Inviting Assumption of Jurisdiction Krueger, Kurt
		* * *	
502.000	02/05/2016	02/05/2016	Atlantic Richfield Company's Supplemental Brief in

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			Support of Summary Judgment on Plaintiffs' Claims for Damages Incurred Prior to the Limitations Period BIDEGARAY, KATHY
503.000	02/05/2016	02/05/2016	Atlantic Richfield Company's Roadmap and Supplemental Authority for Pending Motions for Summary Judgment BIDEGARAY, KATHY
504.000	02/05/2016	02/05/2016	Plaintiffs' Roadmap Reqarding Pending Motions for Summary Judgment (original received 2/8/16) BIDEGARAY, KATHY
		* * *	
508.000	02/26/2016	02/26/2016	Plaintiff's Brief Opposing ARCO's Motion For Summary Judgment

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			Based On The Statute Of Limitations (original received 2/29/16)
			BIDEGARAY, KATHY
509.000	03/11/2016	03/11/2016	Atlantic Richfield Company's Reply in Support of Summary Judgement on Plaintiffs' Claims for Damages Incurred Prior to Limitations Period
			BIDEGARAY, KATHY
		* * *	
519.000	04/27/2016	04/27/2016	Order Denying Plaintiff's Motion for Summary Judgment (Liability) (original received 5/2/16)
			BIDEGARAY, KATHY
		* * *	
521.000	04/28/2016	04/28/2016	Order Denying Arco's Motion for Summary Judgment On Plaintiffs'

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			Trespass and Nuisance Claims (original received 5/2/16) BIDEGARAY, KATHY
		* * *	
524.000	05/03/2016	05/02/2016	Plaintiffs' Supplemental Expert Witness Disclosure - (Original Received 05/04/2016) (143 pages) BIDEGARAY, KATHY
		* * *	
526.000	05/23/2016	05/23/2016	United States' Motion for Leave to File a Brief Amicus Curiae BIDEGARAY, KATHY
527.000	05/23/2016	05/23/2016	Plaintiffs' Response To U.S. EPA's Second Request To Appear as Amicus Curiae BIDEGARAY, KATHY
		* * *	

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
536.000	06/15/2016	06/15/2016	United States' Statement of Willingness to Participate in Oral Argument Scheduled for June 20-21 BIDEGARAY, KATHY
		* * *	
544.000	08/31/2016	08/31/2016	Order Denying Atlantic Richfield Co.s Motion For Summary Judgment On Plaintiff's Strict Liability Claim BIDEGARAY, KATHY

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
545.000	08/31/2016	08/31/2016	Order Denying Arco's Motion for Summary Judgment on Plaintiff's Claim for Summary Judgment on it's Easement Rights & Granting Plaintiff's Motion for Summary Judgment on Arco' Third Affirmative Defense BIDEGARAY, KATHY
546.000	08/31/2016	08/31/2016	Order Denying Arco's Motion for Summary Judgment of Plaintiffs' Claim for Restoration Damages as Barred By CERCLA and Granting Plaintiff's Motion for Summary Judgment on ARCO's CERCLA presemption Affirmative Defenses (11th - 13th) BIDEGARAY, KATHY

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
547.000	08/31/2016	08/31/2016	Order Granting Atlantic Richfield Companys Motion for Summary Judgment On Plaintiff's Negligence Claim BIDEGARAY, KATHY
548.000	08/31/2016	08/31/2016	**Email** Order Denying Atlantic Richfield Cos. Motion for Summary Judgment on Plaintiffs' Claim for Groundwater Damages ad Granting Plaintiffs' Motion ofr Summary Judgment on Atlantic Richfield Companys 5th & 6th Affirmative defenses BIDEGARAY, KATHY
549.000	08/31/2016	08/31/2016	Order Denying Arco's Motion for Summary Judgment Re; Punitive Damages BIDEGARAY, KATHY

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
550.000	08/31/2016	08/31/2016	Order Denying Atlantic Richfield Companys Motion for Summary Judgment on Plaifitffs' Claim for Restoration Damages BIDEGARAY, KATHY
551.000	08/31/2016	08/31/2016	Order Denying Atlantic Richfield Co.s Motion for Summary Judgment on Plaintiff's Claim for Wrongful Occupation BIDEGARAY, KATHY
552.000	08/31/2016	08/31/2016	Order Denying Atlantic Richfield Co's Motion for Summary Judgment On Plaintiffs Claims for Damages Incurred Prior to the Limitations Period BIDEGARAY, KATHY
554.000	09/01/2016	08/31/2016	Order Denying in Part and Granting

DOC. SEQ.	ENTERED	FILED	TEXT JUDGE
			in Part Atlantic Richfield Co.s Motion in Limine Concerning Damages Outside The Statutory Period BIDEGARAY, KATHY
		* * *	
569.000	09/07/2016	09/07/2016	Order Granting Plaintiffs' Motion in Limine (EPA Evidence) BIDEGARAY, KATHY
		* * *	

**[Third Amended Complaint
(Dec. 21, 2012)]**

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Attorneys for Plaintiffs

MONTANA SECOND JUDICIAL DISTRICT
COURT, SILVER BOW COUNTY

———

Cause No. DV-08-173 BN

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GREGORY A. CHRISTIAN; MICHELLE D. CHRISTIAN; ROSEMARY CHOQUETTE; DUANE N. COLWELL; SHIRLEY A. COLWELL; FRANKLIN J. COONEY; VICKI COONEY; GEORGE COWARD; SHIRLEY COWARD; JACK E. DATRES; SHEILA DORSCHER; VIOLA DUFFY; BRUCE DUXBURY; JOYCE DUXBURY; BILL FIELD; CHRIS FIELD; ANDREW GRESS AND FRANK GRESS AS CO-PERSONAL REPRESENTATIVES OF THE ESTATE OF JAMES GRESS; CHARLES GUSTAFSON; MICHAEL HENDRICKSON; BRUCE HOLBROOK; MAUREEN ROBINSON-HOLBROOK; PATRICE

HOOLAHAN; SHAUN HOOLAHAN; ED JONES; RUTH JONES; BARBARA KELSEY; CARL KOEPPLIN; MYRTLE KOEPPLIN; BRENDA KRATTIGER; DOUG KRATTIGER; LADONA KRUM; JULIE LATRAY; LEONARD MANN; VALERIE MANN; KRISTY MCKAY; RUSS MCKAY; BRYCE MEYER; MILDRED MEYER; JUDY MINNEHAN; TED MINNEHAN; DIANE MORSE; RICHARD MORSE; KAREN MULCAHY; PATRICK MULCAHY; NANCY MYERS; SERGE MYERS; LESLIE NELSON; RON NELSON; JANE NEWELL; JOHN NEWELL; GEORGE NILAND; LAURIE NILAND; DAVID OSTROM; ROSE ANN OSTROM; JUDY PETERS; TAMMY PETERS; ROBERT PHILLIPS; TONI PHILLIPS; CAROL POWERS; WILLIAM D. POWERS; GARY RAASAKKA; MALISSA RAASAKKA; ALEX REID; KENT REISENAUER; PETE REISENAUER; SUE REISENAUER; LARRY RUPP; JOHN A. RUSINSKI; KATHRYN RUSINSKI; EMILY RUSS; SCOTT RUSS; CARL RYAN; PENNY RYAN; RICH SALLE; DIANE SALLE; DALE SCHAFER; DAVID D. SCHLOSSER; ILONA M. SCHLOSSER; MICHAEL SEVALSTAD; JIM SHAFFORD; ROSEMARIE SILZLY; ANTHONY SOLAN; KEVIN SORUM; DON SPARKS; VICKIE SPEHAR; ZANE SPEHAR; CARA SVENDSEN; CARON SVENDSEN; JAMES H. SVENDSEN, SR.; JAMES SVENDSEN, JR.; DOUG VIOLETTE; ESTER VIOLETTE; CAROL WALROD; CHARLES WALROD; DARLENE WILLEY; KEN YATES; SHARON YATES; LINDA EGGEN AS PERSONAL REPRESENTATIVE OF THE ESTATE OF WILLIAM YELSA AND AS GUARDIAN OF MAURINE YELSA; DAVID ZIMMER; AND TONI ZIMMER,

Plaintiffs,

vs.

BP AMOCO CORPORATION, A FOREIGN CORPORATION FOR PROFIT; BP CORPORATION NORTH AMERICA, INC., A FOREIGN FOR PROFIT CORPORATION; BP AMERICA, INC., A FOREIGN CORPORATION FOR PROFIT;; BP AMOCO CHEMICAL COMPANY, A CORPORATION; BP AMOCO,

P.L.C., A CORPORATION; THE BRITISH PETROLEUM COMPANY, P.L.C., A FOREIGN CORPORATION FOR PROFIT; ATLANTIC RICHFIELD COMPANY, A CORPORATION FOR PROFIT; ATLANTIC RICHFIELD DELAWARE CORPORATION, A DELAWARE CORPORATION FOR PROFIT; THE ANACONDA DELAWARE CORPORATION, A FOR PROFIT CORPORATION; THE ANACONDA COMPANY, A MONTANA CORPORATION; ANACONDA MINERALS COMPANY, A CORPORATION; ANACONDA COPPER MINING COMPANY; A FOR PROFIT CORPORATION; ESTATE OF FRANK DAY, DECEASED; SHANNON DUNLAP; AND DOES 1 - 100, INCLUSIVE;

Defendants.

THIRD AMENDED COMPLAINT AND JURY DEMAND

COME NOW the Plaintiffs, demanding trial by jury, and for their complaint against the Defendants, allege as follows:

PARTIES

1.

All Plaintiffs, except LaDona Krum and Anthony Solan, are citizens of the State of Montana. Plaintiff LaDona Krum is a citizen of Nevada. Plaintiff Anthony Solan is a citizen of Washington. One or more of the Plaintiffs is a resident of Silver Bow County. Plaintiffs own real property in and around Opportunity, Montana.

2.

Defendant The Anaconda Company is and/or was a business corporation for profit with its principal place of business in the State of Montana.

3.

Defendants Atlantic Richfield Company (ARCO), Atlantic Richfield Delaware Corporation, and The Anaconda Delaware Corporation are business corporations for profit organized and existing under the laws of states other than the State of Montana with principal places of business in states unknown to the Plaintiff. Defendants ARCO; Atlantic Richfield Delaware Corporation; and Anaconda Delaware Corporation were involved in merger agreements, which ultimately resulted in the purchase and/or acquisition of Defendant The Anaconda Company by ARCO. As a result of the said merger agreements and the acquisition of The Anaconda Company, ARCO, Atlantic Richfield Delaware Corporation, and Anaconda Delaware Corporation assumed liability for all claims that could have been brought against The Anaconda Company. For purposes of this action, the allegations and claims against The Anaconda Company are also allegations and claims against ARCO, Atlantic Richfield Delaware Corporation, and Anaconda Delaware Corporation, as successor corporations. (The Anaconda Company, ARCO, Atlantic Richfield Delaware Corporation, and Anaconda Delaware Corporation may be referred to from time to time herein as the "ARCO Defendants.")

4.

Defendants BP Amoco Corporation: BP Corporation North America, Inc.; BP America, Inc.; BP Amoco Chemical Company; BP Amoco, P.L.C.; The British Petroleum Company, P.L.C.; and one or more of Does 1 - 1000 Inc. are business corporations for profit organized and existing under the laws of states other than the State of Montana with principal places of business in States unknown to the Plaintiff (BP Amoco Corporation; BP Corporation North America, Inc.;

BP America, Inc.; BP Amoco Chemical Company; BP Amoco, P.L.C.; The British Petroleum Company, PL.C.; and one or more of Does 1 - 1000 Inc. may be referred to from time to time herein as the "BP Amoco Defendants.") The BP Amoco Defendants were involved in merger agreements, which ultimately resulted in the purchase and/or acquisition of the ARCO Defendants. As a result of the merger agreement and acquisition of the ARCO Defendants, the BP Amoco Defendants assumed liability for all claims which could have been brought against the ARCO Defendants and The Anaconda Company. For purposes of this action, the allegations and claims against the ARCO Defendants and The Anaconda Company are also allegations and claims against the BP Amoco Defendants, as successor corporations.

5.

Defendant the Estate of Frank Day is a citizen and resident of the State of Montana. On the date of his death Frank Day was a citizen and resident of the State of Montana. This action is brought against the Estate of Frank Day for personal torts of Frank Day committed in his individual capacity against the Plaintiffs and in his capacity as manager of The Anaconda Company smelter in Anaconda, Montana.

6.

Defendant Shannon Dunlap is a citizen and resident of Butte, Silver Bow County, Montana. Dunlap is an employee of ARCO. This action is brought against Dunlap for personal torts committed in his individual capacity against the Plaintiffs.

7.

The true names and capacities of Defendants named herein as Does I through 100, inclusive, are unknown to Plaintiffs at this time. Plaintiffs therefore bring this action against Does I through 100, inclusive, by such fictitious names. Plaintiffs will seek leave to amend this complaint to state the true names and capacities of Does 1 through 100 when the same have been ascertained, together with further appropriate charging allegations. Plaintiffs are informed, believe, and thereon allege that each Defendant, fictitiously named Does 1 through 100, is legally responsible for the occurrences herein alleged and that Plaintiffs' damages were proximately caused by each fictitiously named Defendant's unlawful acts or omissions. Defendants Does 1 through 100, inclusive, are natural persons, corporations, partnerships, joint ventures, or other legal entities who wrongfully and unlawfully caused or contributed to Plaintiffs' damages.

JURISDICTION AND VENUE

8.

The District Court has jurisdiction pursuant to § 3-5-302, MCA.

9.

Venue is proper in the Montana Second Judicial District Court, Silver Bow County, Montana, pursuant to § 25-2-117, § 25-2-118, and § 25-2-122, MCA, because Defendant Dunlap is a resident of Silver Bow County, and because the Defendants committed acts resulting in the accrual of this tort action in Silver Bow County.

GENERAL ALLEGATIONS

10.

Each act of negligence, carelessness, recklessness, and maliciousness, and each violation of law alleged herein was committed by Defendants and/or employees or agents of Defendants, acting within the course and scope of their employment or agency with Defendants, and in furtherance of the business interests of Defendants; and each unlawful act or omission alleged herein is imputable to Defendants.

11.

ARCO and its predecessors, acting in the course and scope of their businesses, owned, occupied, operated, managed, used, and/or maintained a milling and smelting operation located near the towns of Anaconda and Opportunity, Deer Lodge County, Montana. This operation and its associated ore processing and smelting facilities were developed to remove copper from ore mined in Butte, Silver Bow County, from 1884 to 1980.

12.

During the period of their ownership and occupancy of the mining, milling, and smelting operation and its associated facilities, and at times since closing the operation, Defendants negligently, suddenly, accidentally, unexpectedly, maliciously, and with reckless disregard of Plaintiffs' rights, caused toxic and hazardous smelter and ore processing wastes - including, but not limited to, mine tailings, furnace slag, flue dust, and heavy metals such as arsenic, copper, cadmium, lead, and zinc - to enter the air, soil, surface waters, and groundwater in and around said facilities.

13.

Said toxic contaminants and hazardous materials migrated, and continue to migrate, by means of air, groundwater, and soil, onto the property of the Plaintiffs.

14.

Defendants intentionally, negligently, maliciously, and/or with reckless disregard of Plaintiffs' rights, made affirmative misrepresentations and/or failed to disclose material facts to Plaintiffs, and/or prior owners of Plaintiffs' property. Defendants were aware of the toxicity and migration of said hazardous materials, knew the hazards associated with the migration of such toxic materials into the community, and failed to warn Plaintiffs, or prior owners of Plaintiffs' property, that their health, welfare, and property values had been jeopardized.

15.

As a direct and proximate result of the Defendants' unlawful conduct, Plaintiffs have suffered damages, including, but are not limited to, loss of real property value, damage to their interests in real property, costs of investigation and restoration of real property, loss of use and enjoyment of property, and incidental and consequential damages.

FIRST CAUSE OF ACTION
(Negligence)

Plaintiffs reallege paragraphs 1 through 15 of this Complaint and Jury Demand and adopt the same as paragraphs 1 through 15 of this First Cause of Action.

16.

Defendants owed Plaintiffs a duty to act with reasonable care, so as not to jeopardize their property, health, and welfare.

17.

Defendants breached their duty of care by negligently, carelessly, and recklessly generating, releasing, depositing, disposing, and failing to control and contain the hazardous and toxic materials generated, used, and released at their Anaconda mining, milling, and smelting operation and its associated facilities. Defendants' negligence is more particularly described as follows:

A. Failure to control and contain heavy metals and other toxic substances generated and spread as a result of Defendants' operations;

B. Failure to prevent said toxic materials from migrating to neighboring properties;

C. Failure to exercise reasonable care to contain the toxins once the Defendants knew or reasonably should have known they had polluted a large area in and about the Plaintiffs' properties;

D. Failure to exercise reasonable care to prevent the escape of Defendants' toxins that permeated the soil and contaminated the groundwater in and about the area of Plaintiffs' properties thereby creating a substantial risk of harm and injury to Plaintiffs and their properties;

E. Failure to remove the toxic substances from the Plaintiffs' properties; and

F. Failure to warn the Plaintiffs of the scope of and dangers posed by the contamination.

18.

As a direct and proximate result of the Defendants' foregoing negligent and unlawful conduct, Plaintiffs have suffered, and continue to suffer, damages and detriment as herein alleged.

SECOND CAUSE OF ACTION
(Public Nuisance)

Plaintiffs reallege paragraphs 1 through 18 of the First Cause of Action and adopt the same as paragraphs 1 through 18 of this Second Cause of Action.

19.

The Plaintiffs are members of the public who reside, work, conduct their personal and business affairs, and have proprietary interests in certain real and personal property in the areas affected by Defendants' contamination. Plaintiffs also have rights incidental to that property, including the right to the exclusive use and quiet enjoyment of the property.

20.

The conduct of Defendants violates § 27-30-101, MCA, *et seq.,* and constitutes a common law nuisance in that it is specially injurious and offensive to the senses of the Plaintiffs, specially interferes with and disturbs their comfortable enjoyment of their life and property, and unlawfully prevents the customary use of their property and residences. The contamination caused by Defendants' activities, as herein described, affects a considerable number of persons, including the entire community surrounding Plaintiffs' property.

21.

To the extent the nuisance is not also a private nuisance, the nuisance is specially injurious to Plain-

tiffs in that they are members of the public who reside or own property within the area immediately affected by the pollution. Plaintiffs therefore have suffered interference with and injury to the use and enjoyment of their property which is different in kind from the injury suffered by the general public.

22.

Unless the nuisance is abated, Plaintiffs' property and rights of enjoyment of their property will be progressively further damaged and further jeopardized in the future.

23.

As a direct and proximate result of the public nuisance alleged herein, Plaintiffs have suffered, and continue to suffer damages and detriment as herein alleged.

THIRD CAUSE OF ACTION
(Private Nuisance)

Plaintiffs reallege paragraphs 1 through 23 of the Second Cause of Action and adopt the same as paragraphs 1 through 23 of this Third Cause of Action.

24.

Plaintiffs have ownership and/or proprietary interests in certain real and personal property in the areas affected by the Defendants' toxic contamination released into the soil, air, and water. Plaintiffs also have the right to the exclusive use and quiet enjoyment of their property.

25.

The conduct of the Defendants constitutes a private nuisance in that such conduct has caused substantial injury to and interference with the comfortable enjoy-

ment and use by Plaintiffs of their real and personal property, and their rights to use their property and residences in the customary manner without exposure to or concern regarding the dangers of toxic substances.

26.

Unless the nuisance is abated, Plaintiffs' property and their right to use and enjoy their property and their interests will be progressively further jeopardized.

27.

As a direct and proximate result of the private nuisance created by Defendants's unlawful conduct and activities, and the toxic dumping that resulted therefrom, Plaintiffs have suffered, and continue to suffer damages and detriment as herein alleged.

FOURTH CAUSE OF ACTION
(Trespass)

Plaintiffs reallege paragraphs 1 through 27 of the Third Cause of Action and adopt the same as paragraphs 1 through 27 of this Fourth Cause of Action.

28.

At all times relevant to the causes of action alleged in this Complaint, Plaintiffs resided on, owned, and/or lawfully possessed property within the area affected by the contamination.

29.

The Defendants intentionally, recklessly, negligently, without just cause and by conducting an abnormally dangerous activity, committed the wrongful act of trespass by causing heavy metals, including arsenic, copper, cadmium, lead, and zinc, and other toxic contaminants and hazardous substances, including mine tailings, furnace slag, and flue dust, to invade and to

remain on the real property of Plaintiffs. Said toxic substances were transported on to Plaintiffs' properties by air, soil, and groundwater.

30.

Defendants have failed to remove said toxic substances from the property.

31.

As a direct and proximate result of Defendants' trespass, Plaintiffs have suffered, and continue to suffer damage and loss to their real property as herein alleged.

FIFTH CAUSE OF ACTION
(Strict Liability for Abnormally Dangerous Activity)

Plaintiffs reallege paragraphs 1 through 31 of the Fourth Cause of Action and adopt the same as paragraphs I through 31 of this Fifth Cause of Action.

32.

The mining, milling, smelting, use, disposal, and release of large quantities and concentrations of heavy metals and other hazardous substances as herein alleged and the operation of a large scale mining, milling, and smelting operation immediately adjacent to a residential community is an abnormally dangerous and ultra hazardous activity in that:

A. There exists a high degree of risk of serious harm to the environment, persons, land, chattels of others, including Plaintiffs, which cannot be eliminated by the exercise of reasonable care;

B. There is a strong likelihood that great harm will result from the mining, Milling, smelting, use, disposal, and release of such hazardous materials and toxic substances;

C. The mining, milling, smelting, use, disposal, and release of such hazardous materials and toxic substances in large quantities and concentrations in close proximity to a residential community is not a matter of common usage such as would be carried on by the great mass of mankind or many people in the community;

D. The manner in which Defendants mined, milled, smelted, used, disposed, and released such materials at their facilities is and was inappropriate; and

E. The value to Defendants of the mining, milling, smelting, use, disposal, and release of such large quantities and concentrations of hazardous materials and toxic substances adjacent to a residential community is outweighed by the likelihood of harm resulting therefrom.

33.

As a direct and proximate result of Defendants' unlawful actions and abnormally dangerous and ultra hazardous activities, Plaintiffs have suffered, and continue to suffer, damages and detriment as herein alleged.

SIXTH CAUSE OF ACTION
(Constructive Fraud)

Plaintiffs reallege paragraphs 1 through 33 of the Fifth Cause of Action and adopt the same as paragraphs 1 through 33 of this Sixth Cause of Action.

34.

Defendants, including Defendant Dunlap and including Defendant The Estate of Frank Day, by and through its decedent Frank Day, have known for decades that their conduct as herein alleged caused toxic sub-

stances and hazardous materials to enter the air, soil and groundwater and, as such, invade and remain on Plaintiffs' real property.

35.

Defendants, and each of them, had, and continue to have, an absolute duty to disclose fully and to warn Plaintiffs, on an ongoing basis, of the nature of, type of, extent of, scope of contamination and the risks posed by the toxic substances and hazardous materials released by the Defendants' mining, milling, and smelting operation and its associated facilities.

36.

Defendants breached, and continue to breach, their duties, as set forth in the preceding paragraph, and further, have misrepresented and continue to misrepresent, downplay, and conceal material facts, thereby gaining an unfair advantage, by deception, over Plaintiffs to their prejudice, all in violation of § 28-2-406, MCA, and the common law of Montana.

37.

As a result of Defendants' constructively fraudulent and deceitful acts, Plaintiffs' interests were compromised because they relied upon the misinformation of Defendants' to their detriment and suffered damages, and continue to suffer damages and detriment as herein alleged.

SEVENTH CAUSE OF ACTION
(Unjust Enrichment)

Plaintiffs reallege paragraphs 1 through 37 of the Sixth Cause of Action and adopt the same as paragraphs 1 through 37 of this Seventh Cause of Action.

38.

The Defendants intentionally, negligently, unlawfully, and wrongfully disposed of and deposited toxic substances onto the Plaintiffs' properties. Despite knowledge that the Defendants had contaminated the Plaintiffs' properties, the Defendants have failed and refused to timely and properly remove the contamination.

39.

The Defendants' use of Plaintiffs' property to dispose of, deposit, and store toxic substances is wrongful and unlawful. Plaintiffs did not consent to the use of their property in that manner.

40.

The Defendants' unauthorized use of Plaintiffs' property has benefitted them monetarily to the Plaintiffs' detriment. The Defendants are therefore unjustly enriched, and Plaintiffs are entitled to damages as a result of the Defendants' unjust enrichment.

SEVENTH CAUSE OF ACTION
(Wrongful Occupation of Real Property)

Plaintiffs reallege paragraphs 1 through 40 of the Seventh Cause of Action and adopt the same as paragraphs 1 through 40 of this Eighth Cause of Action.

41.

Defendants have wrongfully occupied and continue to wrongfully occupy Plaintiffs' private property in violation of § 27-1-318, MCA, and Montana common law.

42.

As a result of Defendants' wrongful occupation of Plaintiffs' property, Plaintiffs have suffered, and continue to suffer damages and detriment as herein alleged.

DAMAGES

43.

As a direct and proximate result of Defendants' wrongful and unlawful acts and omissions, as herein alleged, Plaintiffs were injured, have suffered, continue to suffer, and/or are reasonably certain to suffer, the following harm, detriment, and damages:

A. Injury to and loss of use and enjoyment of real and personal property:

B. Loss of the value of real property and rights incidental thereto, and loss of use of that value and those rights:

C. Incidental and consequential damages, including relocation expenses and loss of rental income and/or value:

D. Annoyance, inconvenience and discomfort over the loss and prospective loss of property value, economic opportunities, ways of life and other legal rights: and

E. Expenses for and cost of investigation and restoration of real property:

44.

The Montana Constitution guarantees all persons in Montana the inalienable, fundamental right to acquire, possess, and protect property, as well as the right to a clean and healthful environment. Defendants' conduct has violated the Plaintiffs' constitutional rights, and

Plaintiffs are entitled to damages for full restoration of their property as necessary to protect these constitutional rights.

45.

The Defendants have been unjustly enriched. Plaintiffs are entitled to damages as a result of the Defendants' unjust enrichment.

46.

Plaintiffs are entitled to damages for Defendants' wrongful occupation of the Plaintiffs' properties.

47.

Plaintiffs have suffered and continue to suffer actual damages as a result of Defendants' unlawful conduct.

48.

Although Defendants have known for many years that their unlawful conduct has caused, and continues to cause, actual and extensive harm to Plaintiffs and their property interests, Defendants have deliberately proceeded to act in conscious and intentional disregard for and indifference to the harm and the high probability of further injury and harm to Plaintiffs. The conduct of Defendants' is so intentional, fraudulent, malicious, and egregious so as to shock the conscience and present an affront to societal interests that are unfathomable. Defendants have acted with cold and calculated indifference to the rights and interests of the Plaintiffs and their community.

49.

Defendants have made misrepresentations of fact with knowledge or their falsity and have concealed material facts with the purpose of depriving Plaintiffs

of their property or legal rights and otherwise causing them injury, harm, and damages.

50.

Defendants were, and are, guilty of intentional misconduct, actual malice, which justifies imposition of punitive or exemplary damages in a sufficient amount to punish them and to serve as warning to other legal entities similarly situated that such conduct is unacceptable in our society and will not be tolerated.

JURY DEMAND

Plaintiffs demand trial by jury.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs pray for judgment against the Defendants and awarding damages for following:

1. Reasonable compensation to Plaintiffs for all harm they have suffered as a result of Defendants' unlawful conduct;

2. Damages for investigation and restoration of Plaintiffs' property and other contaminated property in close proximity to Plaintiffs' property in order to remove present contamination and prevent future contamination;

3. Reasonable compensation for loss of property value;

4. Reasonable compensation for loss of use and enjoyment of real property;

5. Damages for the value of Defendants' unauthorized use and wrongful occupation of Plaintiffs' property, as well as the costs necessary to Plaintiffs to recover possession of their property, including all necessary investigation and restoration costs;

6. Reasonable compensation for unjust enrichment;

7. Reasonable compensation for annoyance, inconvenience, and discomfort over the loss and prospective loss of property value, economic opportunities, and other legal rights;

8. Punitive and exemplary damages in an amount sufficient to punish and to deter Defendants and others similarly situated from engaging in similar wrongdoing;

9. Incidental and consequential damages, including relocation expenses and loss of rental income and value;

10. Costs and disbursements incurred herein; and

11. Such other and further relief as the Court deems just and equitable.

DATED this 21 day of December, 2012.

LEWIS, SLOVAK, KOVACICH & MARR, P.C.
and
BECK & AMSDEN, PLLC

By: /s/ Mark M. Kovacich
Mark M. Kovacich
P.O. Box 2325
Great Falls, MT 59403

Attorneys for Plaintiffs

[Community Soils OU ROD (Sept. 1996)]

RECORD OF DECISION

COMMUNITY SOILS
OPERABLE UNIT
ANACONDA SMELTER NPL SITE
ANACONDA, MONTANA

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September 25, 1996

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UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY
Region VIII, Montana Office
Federal Building, Drawer 10096
301 South Park
Helena, MT 59626
(406) 441-1150
(Lead Agency)

———

MONTANA DEPARTMENT OF
ENVIRONMENTAL QUALITY
2209 Phoenix Avenue
Helena, MT 59620
(406) 444-1420
(Support Agency)

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Document Control Number: 7760-037-DD-DNJY

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DECLARATION

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DECLARATION

SITE NAME AND LOCATION

Anaconda Smelter NPL Site
Anaconda, Deer Lodge County, Montana
Community Soils Operable Unit

STATEMENT OF BASIS AND PURPOSE

This decision document presents the Selected Remedy for the Community Soils Operable Unit (OU) of the Anaconda Smelter NPL Site in Deer Lodge County, Montana. EPA, with the concurrence of DEQ, selected the remedy in accordance with CERCLA and the NCP.

This decision is based on the Administrative Record for the Community Soils OU of the Anaconda Smelter NPL Site. The Administrative Record (on microfilm) and copies of key documents are available for public review at the Hearst Free Library, located on the corner of Fourth and Main in Anaconda, Montana, and at the Montana Tech Library in Butte, Montana. The complete Administrative Record may also be reviewed at the EPA Records Center in the Federal Building, 301 South Park, in Helena, Montana.

The State of Montana concurs with the Selected Remedy, as indicated by its signature.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances at and from the Community Soils OU, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The Community Soils OU is the fourth remedial action to be taken at the Anaconda Smelter NPL Site.

The first action, taken at the Mill Creek OU, involved the relocation of residents from the community of Mill Creek after other initial stabilization and removal efforts. The second action was the Flue Dust OU, which addressed one of the principal threat wastes (flue dust) remaining on the Anaconda Smelter NPL Site. That action addressed flue dust at the site through removal, treatment, and containment. At approximately the same time, other removal actions were undertaken, including permanent removal and disposal of Arbiter and beryllium wastes and the selective removal of contaminated residential yard materials from the community of Anaconda. The third action addressed various waste sources found within the Old Works/East Anaconda Development Area OU, located adjacent to the community of Anaconda, and in areas of future development, and followed an initial removal action in the same area. Certain wastes within the OW/EADA OU received an engineered cover, including the Red Sands waste material and the Heap Roast slag piles, while others were consolidated and/or covered, including the Floodplain wastes and miscellaneous waste piles. In addition, the third action allowed economic development (i.e., construction of a golf course in the Old Works area) and provided the final response action at the Mill Creek OU.

This remedial action at the Community Soils OU will address all remaining residential and commercial/industrial soils within the Anaconda Smelter NPL Site. The principal contaminant of concern at the Community Soils OU is arsenic in surficial soils from past aerial emissions and railroad beds constructed of waste material. This ROD establishes residential and commercial/industrial action levels for arsenic at the Anaconda Smelter NPL Site.

All remaining cleanup decisions for the Anaconda Smelter NPL Site will be made under the Anaconda Regional Water, Waste, and Soils (ARWWS) OU. The ARWWS OU is intended to be the last OU at the site and will address potential impacts to surface and groundwater from soils and waste sources such as tailings and slag. This OU will address human and environmental risks associated with site-specific contamination that have not been addressed by other response actions.

Major components of the remedy for residential soils include:

1. Clean up all current residential soils that exceed the residential action level of 250 parts per million (ppm) soil arsenic concentration, through removal and replacement with clean soil and placement of a vegetative or other protective barrier;

2. In areas where specific site conditions dictate that removal is not implementable, treatment or other measures (e.g., capping, tilling, Institutional Controls (ICs) will be taken to reduce arsenic concentrations to below the 250 ppm action level or to prevent exposure;

3. Clean up all future residential soils at the time of development that exceed the residential action level of 250 ppm soil arsenic concentration, through the Anaconda-Deer Lodge County (ADLC) Development Permit System (DPS); and

4. Implement ICs to provide educational information to all residents describing potential risks, and recommendations to reduce exposure to residual contaminants in soils, and to ensure the long-term viability of this remedy.

Major components of the remedy for commercial/industrial soils include:

1. Clean up all current commercial or industrial areas that exceed the commercial/industrial action level of 500 ppm soil arsenic concentration through a combination of revegetative techniques and/or engineered covers; and

2. Clean up all future commercial or industrial areas at the time of development that exceed the commercial/industrial action level of 500 ppm soil arsenic concentration through the ADLC-DPS.

Major components of the remedy for the railroad beds include:

1. Construct an engineered cover over all contaminated railroad bed material within the community of Anaconda to prevent direct contact with, and reduce potential for erosion and transport of, contaminated materials to residential and commercial/industrial areas;

2. Separate the railbed from residential and commercial/industrial areas with a barrier to restrict access to the railbed and to control surface runoff from the railbed through the use of retaining walls and/or curbing; and

3. Maintain existing ICs to restrict access.

The Selected Remedy will achieve reduction of risk to human health through the following:

- Reduction of surface soil arsenic concentrations in residential and commercial/industrial areas to acceptable levels; and/or
- Prevention of direct human contact with waste materials exceeding acceptable levels.

STATUTORY DETERMINATIONS

The Selected Remedy is protective of human health and the environment, complies with federal and state

requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy uses permanent solutions (e.g., soil removal and engineered covers) and alternative treatment technologies to the maximum extent practicable for this site. The remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. Treatment is not a principal element of the remedy because 1) soils are being removed, thus eliminating the need for treatment and 2) treatment of railroad bed materials was not found to be practicable on an active rail line. However, treatment of other principal threats has been employed in other response actions at the site.

Since hazardous substances above health-based risk levels will remain on site, (i.e., railroad beds and on-site soil management areas) a review will be conducted within five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

/s/ Max H. Dodson
Max H. Dodson, Director
Ecosystems Protection and Remediation Division
U.S. Environmental Protection Agency, Region VIII

9/30/96
Date

/s/ Mark A. Simonich
Mark A. Simonich, Director
Montana Department of Environmental Quality

9/26/96
Date

* * *

2.0 OPERABLE UNIT HISTORY AND ENFORCEMENT ACTIVITIES

Around 1884, the Anaconda Mining Company (AMC) and its predecessors commenced large copper concentrating and smelting operations at the area presently known as the Old Works. The Old Works was located on the north side of Warm Springs Creek, west of Anaconda, and operated until about 1901. In about 1902, ore processing and smelting operations began at the Washoe Reduction Works (also called the Anaconda Smelter, the Washoe Smelter, the New Works, and the Anaconda Reduction Works) on Smelter Hill, south of Warm Springs Creek across from the Old Works which was owned and operated by AMC, its successors, and/or its subsidiaries. In 1977, Atlantic Richfield Company (ARCO) purchased AMC and expressly assumed its liabilities. Operations at the Anaconda Smelter ceased in 1980, and the smelter facilities were dismantled soon thereafter. The only substantial feature remaining from the smelter facility is the large brick smelter stack on Smelter Hill. ARCO has been identified as the Potentially Responsible Party (PRP) for this site.

The Anaconda Smelter NPL Site was placed on the NPL in September 1983, under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The U.S. Environmental Protection agency (EPA) issued both general and special notice letters to ARCO on several occasions and ARCO has been actively involved in conducting investigations and response actions at the site since that time. On April 12, 1984, ARCO entered into an Administrative Order on Consent (AOC) with EPA to conduct demolition activities at the smelter. In October 1984, ARCO entered into another AOC to

conduct several investigations at the Anaconda Smelter NPL Site to characterize soils, surface water, groundwater, and solid wastes. Early draft reports based on initial investigations indicated wide-spread contamination and the need for more in-depth study,

In the initial stages of the investigations, it was discovered that the soils within the community of Mill Creek, located two miles east of Anaconda, had elevated levels of arsenic. Children in Mill Creek also had elevated urinary arsenic levels, indicating an excess exposure to arsenic in their environment. Families with young children were temporarily relocated from the community in May 1986. At that time, flue dust, the most concentrated arsenic and heavy metal source on the site, was sprayed with surfactant to reduce fugitive emissions, and contaminated road dust in the community was treated to reduce inhalation exposures. Following temporary relocation, none of these children had levels of urinary arsenic above the levels of concern as determined by the Center for Disease Control.

In July 1986, EPA entered into an AOC with ARCO to conduct an expedited RI/FS for the Mill Creek community. The ROD for Mill Creek was completed in October 1987. The selected remedy was the permanent relocation of all Mill Creek residents. EPA negotiated a Consent Decree with ARCO concerning the implementation of the relocation remedy for Mill Creek residents on January 7, 1988. The permanent relocation was completed in fall 1988.

The generation and airborne transport of stack particulate and fugitive dust emissions during smelting operations also resulted in contamination of soils and household dust by arsenic, cadmium, copper, lead, and zinc in other areas surrounding the smelter. In

addition, it was suspected that contaminated material from the Old Works Smelter facilities was present around homes in three Anaconda neighborhoods (Teresa Ann Terrace, Elkhorn Apartments, and Cedar Park Homes).

On September 28, 1988, ARCO entered into an AOC (Docket No. CERCLA VIII-88-06) with EPA to conduct an Engineering Evaluation/Cost Analysis (EE/CA) study and investigation for the Old Works and Community Soils OUs of the Anaconda Smelter NPL Site. Results of sampling conducted by ARCO in 1988-1989 in the areas of Teresa Ann Terrace, Elkhorn Apartments, and Cedar Park Homes indicated the presence of elevated heavy metal concentrations at or near the soil surface. Sampling conducted by ARCO in 1990 confirmed the presence of elevated concentrations of heavy metals in several yards, gardens, and common areas of the three neighborhoods.

A September 17, 1991, an Action Memorandum (with a concurrent AOC) required ARCO to conduct a Time-Critical Removal Action (TCRA) by excavating and removing contaminated soils in areas of Teresa Ann Terrace, Elkhorn Apartments, and Cedar Park Homes where arsenic concentrations exceeded 250 milligrams per kilogram (mg/kg). Under the TCRA, removal of arsenic-contaminated soils to 18 inches and replacement of topsoil and grass began in late 1991 and was completed in September 1992. Removal occurred on about 8 acres of undeveloped lots and 19 yards in Teresa Ann Terrace, on 32 yards around the Elkhorn apartments, and on 14 yards around Cedar Park Homes.

In 1991, ARCO and EPA amended an AOC (Docket No. CERCLA VIII-88-16) to conduct the Anaconda Soils Investigation to provide information to support

future RI/FS activities at the Anaconda Smelter NPL Site. The investigation focused on five geographic areas: community soils; near community soils; community targeted soils; regional soils; and regional targeted soils. One of the primary objectives of the investigation was to delineate the nature and extent of metals contamination resulting from airborne particulate deposition.

In 1992, ARCO initiated an Arsenic Exposure Study through the University of Cincinnati, to measure arsenic in Anaconda residents and evaluate possible exposure pathways. Several hundred families participated in this study to provide environmental (i.e., soil, dust, food, and water) and biological (i.e., urine) data. Data from this study was utilized by EPA in the Final Baseline Human Health Risk Assessment (HHRA) for the Anaconda Smelter NPL Site (CDM Federal 1996a).

Also in 1992, EPA and ARCO further amended AOC 88-16 to conduct the Old Works/East Anaconda Development Area (OW/EADA) OU investigations. The March 1994 ROD for the OW/EADA OU selected a combination of engineering and institutional controls (ICs) as the remedy. Remediation of recreational and commercial/industrial areas was conducted where waste and soils exceeded arsenic levels of 1,000 and 500 ppm, respectively.

In early 1994, EPA began the scoping process for the human health risk assessment, culminating in the completion of the Final Baseline HHRA in January 1996.

In 1995, ARCO and EPA entered into the 8th Amendment to AOC 88-16 to conduct a Phase I Soils Remedial Investigation from previous studies to

support both the Community Soils and ARWWS OUs. This investigation contains the completed characterization of residential soils at the site. The Feasibility Study (FS) portion of this Community Soils RI/FS was conducted under the 7th Amendment to the AOC in 88-16.

The Community Soils OU addresses all remaining residential and commercial/industrial soils of the Anaconda Smelter NPL Site. This OU will also bring closure to previous actions conducted at residential properties within the site (i.e., Community Soils TCRA and actions taken through the County's Development Permit System) as well as commercial/industrial properties. Other cleanup actions, not related to soil contamination, have been selected and implemented at the Anaconda Smelter NPL Site.

* * *

4.0 SCOPE AND ROLE OF OPERABLE UNIT

The Anaconda Smelter NPL Site covers a wide area (Figure 2) and is currently organized into the following OUs:

- Anaconda Smelter Demolition and Initial Stabilization Actions
- Mill Creek Children Relocation Removal Action
- Mill Creek Relocation Remedial Action
- Anaconda Yards Time Critical Removal Action
- Arbiter Non-Time Critical Removal/Beryllium Non-Time Critical Removal Action and Repository Construction
- Old Works Stabilization Removal Action
- Flue Dust Remedial Action

- Old Works/East Anaconda Development Area Remedial Action
- Community Soils Remedial Action
- Anaconda Regional Water, Waste, and Soils Remedial Action

The OUs were prioritized based on their potential risk to human health and the environment. Mill Creek was considered the highest priority and EPA relocated Mill Creek residents in 1988. Since then, EPA has also taken action at several other areas, including Flue Dust, Arbiter, Beryllium, OW/EADA, and Community Soils. Completion of the Community Soils OU is considered the next priority because of the potential exposure of remaining residents to elevated arsenic concentrations.

The Conceptual Site Management Plan (SMP) was formally revised in October 1995, with the Community Soils and ARWWS OUs identified for remaining ROD completion. A brief description of the Community Soils and ARWWS OUs is provided below:

Community Soils Operable Unit. The Community Soils OU will address residential soils throughout the entire Anaconda Smelter NPL Site, including potentially contaminated soils and wastes in the communities of Anaconda, Fairmont, Galen, Opportunity, and Warm Springs, as well as rural residential areas. This includes all land use areas (i.e., residential, commercial/ industrial, and recreational) within these general residential areas. The Community Soils RI/FS will primarily address human health risks from contact with contaminated soils and will result in the development of a residential soil action level for arsenic to be used sitewide.

Anaconda Regional Water, Waste, and Soils Operable Unit. This OU combines the former Anaconda Regional Water and Waste, Anaconda Soils, and Smelter Hill OUs. No further activities will be required under the Anaconda Soils and Smelter Hill OUs. The ARWWS OU is intended to be the last OU of the Anaconda Smelter NPL Site and will address all remaining issues not addressed under other remedial actions. This OU will continue to address potential impacts to surface and groundwater from soils and waste sources such as tailings and slag. This OU will address both the human and environmental risks associated with site-related contamination that have not been addressed by other OUs.

The scope of the Community Soils OU. as defined in the *Anaconda Smeller NFL Site, Community Soils RI/FS Work Plan* (ARCO 1994), is to address all residential areas within the NPL Site. These generally include the communities of Anaconda, Opportunity, Warm Springs, Galen, and Fairmont, and also include adjacent rural residential areas. Residential areas include all land uses (i.e., residential, commercial/ industrial, and recreational) within the general residential or community setting. Areas of concern within these communities generally include yard areas and other areas frequented by children (i.e., playgrounds and schools). In addition, potential source areas within the communities, including railroad beds and imported waste/fill areas in both residential and commercial/ industrial areas, will also be addressed. Remediation of ground and surface water is outside the scope of this project and will be evaluated, along with other contamination, under the ARWWS OU.

The purpose of the Community Soils OU RI/FS was to gather sufficient information to support an informed

risk management decision for remediating potential human health risks in residential and commercial/ industrial areas of the site. The RI/FS was performed in accordance with EPA guidance (EPA 1988), the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300, and CERCLA Section 104, 42 U.S.C. § 9604.

The objectives of the RI/FS were to:

- characterize the nature and extent of arsenic and metals in community and regional soils, including the railroad bed materials;
- identify potential receptors, exposure patterns, food chain relationships, and the human health risks posed at the site from soil contamination;
- identify potential soil areas of concern based on arsenic and other metals concentrations, potential risks, and the current or reasonably anticipated future land use that may require development of remedial alternatives;
- determine the effectiveness of soil treatment on arsenic in soils through treatability studies;
- further define or modify each of the alternatives listed in the work plan, with respect to areas of concern and the technologies to be used, to be assessed in this FS;
- analyze each of the FS alternatives against the NCP (40 C.F.R. 300.430) criteria; and
- compare the relative performance among each alternative with respect to the evaluation criteria.

Based on the findings of previous investigations and the results of the Community Soils OU RI/FS (AGC 1996a), the sources and areas of contamination at the

Community Soils OU have been adequately delineated to evaluate alternatives in the RIM.

This ROD was prepared according to EPA guidance (EPA 1989). The remedy outlined in this ROD is intended to be the final remedial action for residential and commercial/industrial soils within the Community Soils OU. It is also intended to be the final remedial action for waste materials (i.e., railroad beds) within the communities. The primary purpose of the remedy presented in this ROD is to prevent human exposure, by inhalation and ingestion, to contaminated soil and smelter waste materials. Remedial actions for other media (e.g., ground and surface water and environmental risk) are deferred to the ARWWS OU. Remedial actions undertaken at the Community Soils OU are intended to be consistent with the remedial action objectives and goals identified for the ARWWS OU.

* * *

5.2 SURFACE SOILS

5.2.1 BACKGROUND SOIL CONCENTRATIONS

Soil, air, and groundwater arsenic, cadmium, and lead background concentrations were compiled in the *Final Remedial Investigation Report, Mill Creek, Montana, Anaconda Smelter Superfund Site* (ARCO 1987). In addition, a literature review of environmental media, including soils, was conducted as part of a public health and environmental assessment in the Rocker and Ramsey areas (CH2MHill/Chen-Northern 1989). For the Baseline HHRA (CDM Federal 1996a), regional background values for arsenic, cadmium, and lead cited in the Mill Creek Remedial Investigation (RI) report (ARCO 1987) (and included in the CH2MHill/Chen-Northern, 1989, literature review) were considered the most appropriate background

values for the Anaconda area. Samples from non-impacted areas of Helena Valley, Philipsburg, Townsend, and Livingston were used to establish regional background levels. These communities were generally similar to those of Deer Lodge Valley. Upper and lower 95% confidence intervals around the geometric mean were calculated to establish ranges of background soil metals concentrations. Based on these data, the following ranges of background soil concentrations (in mg/kg) for arsenic, cadmium, and lead were established:

Arsenic	6-16
Cadmium	0.5-1.4
Lead	18-70

Although the Mill Creek RI report did not establish background concentrations for copper and zinc, these data were available for the same Helena Valley (zinc only), Philipsburg, and Townsend stations used to estimate background concentrations for arsenic, cadmium, and lead. Using similar statistical analysis, the following ranges of background soil concentrations (in mg/kg) for copper and zinc were established:

Copper	17-29
Zinc	56-78

5.2.2 SURFACE SOIL DATA

Analytical data from previous site investigations (Table 1) includes more than one thousand concentration values at locations covering an area of approximately 300 square miles. The magnitude and extent of arsenic, cadmium, copper, lead, and zinc concentrations in surface (0 to 2 inch) soils in the community and regional areas has been characterized by compiling these analytical data into databases for

three separate areas: the Anaconda community, Opportunity community, and the Regional area.

Kriging exercises were conducted for surface soil concentrations of several metals in the three areas. Kriging is a geostatistical method that was used to predict concentrations between known sample values and was used to characterize the surficial soil data for the site. The metals studied in each of the two communities were arsenic, cadmium, and lead. Metals studied regionally were arsenic, cadmium, copper, lead, and zinc.

The geostatistical methods used in this study are referred to as ordinary and general relative kriging. Ordinary and general relative kriging enables an estimation of values at a point, or within an area for which there are few or no sample values, based on a set of neighboring values. It produces a regular grid of interpolated point or block estimates and the kriging standard deviation. The estimates are calculated from a weighted average of neighboring sample values that are located within a specified radius of influence. Kriging also provides a measure of the reliability of the estimates, because it takes into account the spatial variability of the data. At the Anaconda Smelter NPL Site, the spatial variability of metals concentrations in surficial soil is partly attributed to the dispersion of airborne particulates from the former Anaconda Smelter stack. Further discussion of the methods used, results, and limitations, is provided in the Soil Characterization Report (AGC 1996b).

Results presented in the Soils Characterization Report are based on kriging efforts (model selection, data set preparation, project-specific assumptions) conducted by ARCO's contractors in consultation with EPA. These kriging results have been determined to

be sufficient for the purpose of the Community Soils RI. Other methods of kriging using different models, data sets, and assumptions may produce slightly different but still valid kriging results.

A summary of all of the kriging results is presented in Table 2 for the three areas. An initial screening of the soil concentration data eliminated cadmium, copper, and zinc from further consideration from a human health standpoint, and only arsenic and lead were fully evaluated in the Final Baseline HHRA (CDM Federal 1996a), Therefore, for the following summaries, only the results for arsenic and lead are discussed. A complete discussion of all results is provided in the RI/FS report (AGC 1996a).

Results - Anaconda

The kriging block size for Anaconda was set to match the size of the city blocks in the central and eastern parts of town, and a total of 551 blocks were included in the kriging effort.

- *Arsenic.* Estimated concentrations of arsenic within the kriged blocks in Anaconda range from 72 to 514 mg/kg, with an arithmetic mean concentration of 186 mg/kg. Estimated concentrations of arsenic are highest in the eastern portion of Anaconda, which is closest to the primary source, the smelter stack. The highest estimated concentrations of arsenic are generally in commercial/industrial areas. Within residential areas, estimated arsenic concentrations range from 72 to 316 mg/kg. Kriged blocks in residential areas with soil arsenic concentrations greater than the 250 ppm action level are shown in Figure 4.

- *Lead.* Estimated lead concentrations within the kriged blocks range from 111 to 698 mg/kg, with an arithmetic mean of 328 mg/kg. The highest estimated concentrations of lead are found in central Anaconda.

Results - Opportunity

The kriged area for Opportunity includes 360 3-acre blocks. The majority of these are within the core of the community, where land use includes residential, public/institutional, commercial/ industrial, recreational, and agricultural. The remainder are in the area outside the core, where land use includes open space, pasture, and agriculture.

- *Arsenic.* Estimated concentrations of arsenic within the kriged blocks in Opportunity range from 98 to 230 mg/kg, with an arithmetic mean concentration of 154 mg/kg. Overall, the highest estimated arsenic concentrations are found on the west side of Opportunity, in areas used as open space or agricultural. No blocks exceeded the soil arsenic concentration action level of 250 ppm.
- *Lead.* Estimated concentrations of lead within the kriged blocks range from 101 to 238 mg/kg, with an arithmetic mean concentration of 153 mg/kg. The estimated lead concentrations are highest in the edges of the community, particularly to the south. These concentrations are below the lead concentrations seen in Anaconda.

Results - Regional

The regional kriging effort was conducted using a block size of 70 acres and a grid consisting of 3,033 cells.

- *Arsenic.* Estimated arsenic concentrations in the regional kriged blocks range from 29 to 1,856 mg/kg, with an arithmetic mean concentration of 195 mg/kg. Estimated concentrations of arsenic exceed 1,000 mg/kg in 32 blocks. The highest estimated arsenic concentrations are found in the rural areas between Anaconda and Opportunity in a somewhat triangular area running northwest from just behind Smelter Hill to the area just beyond the airport. The orientation of the area roughly approximates the primary direction of wind flow in the area. Those blocks which kriging shows to have soil arsenic concentrations greater than the 250 ppm action level are shown in Exhibit 1.
- *Lead.* Estimated concentrations of lead within the kited blocks range from 16 to 825 mg/kg, with an arithmetic mean of 127 mg/kg. The highest concentrations are found within the Smelter Hill area as well as northwest and west of the area. Some of the higher concentrations are also found west of Anaconda.

5.3 SUBSURFACE SOILS

Subsurface soil samples were collected in most of the previous investigations. The majority were collected from soil profile sampling stations, where samples were collected from various depth intervals. The number of intervals sampled varied between investigations, but the most common intervals were: 0 to 2

inches, 2 to 10 inches, and 10 to 24 inches. The following is a review of the magnitude and extent of metals distribution in the subsurface soil. Table 3 provides a summary of subsurface soil samples for community and regional locations.

In Anaconda, arsenic concentrations in the 2- to 10-inch interval ranged from 16 to 326 mg/kg, with an arithmetic mean of 140 mg/kg. Only five of the 41 samples had arsenic concentrations that exceeded 250 mg/kg. Four of these samples were located in residential areas. Lead concentrations in the 2- to 10-inch interval ranged from 9 to 390 mg/kg, with an arithmetic mean of 111 mg/kg.

There are 35 profile stations with a total of 96 samples in Anaconda. These include 62 subsurface and 34 surface samples. Arsenic concentrations decrease with depth at a majority of the stations. At stations where increases occur, the increases do not appear to be statistically significant. Five of the 15 stations with increases have arsenic concentrations over 250 mg/kg.

In Opportunity, arsenic concentrations in the 2- to 10-inch interval ranged from 18 to 125 mg/kg, with an arithmetic mean of 71 mg/kg. Lead concentrations in the 2- to 10-inch interval ranged from 9.4 to 63 mg/kg, with an arithmetic mean of 40 mg/kg.

Soil profile samples in Opportunity include 41 samples from 16 stations. These include 25 subsurface samples and 16 surface samples. Arsenic concentrations decrease with depth at 15 of 16 stations. At the single station with an increase, the concentration was above 250 mg/kg.

In regional subsurface samples, arsenic concentrations in the 2- to 10-inch interval ranged from 2 to

2,440 mg/kg, with an arithmetic mean of 237 mg/kg. Lead concentrations in the 2- to 10-inch interval ranged from 6 to 4,550 mg/kg, with an arithmetic mean of 88 mg/kg. Most samples with the highest arsenic and lead concentrations are located in the Smelter Hill area.

* * *

6.11 SUMMARY

Cancer risks, calculated using averaged RME concentrations for soil/dust for all evaluated subareas of the site, fall into a narrow range of about 1E-05 to 3E-05. This narrow range reflects the relatively even distribution of arsenic within Anaconda and Opportunity. A similar narrow range of non-cancer risks (hazard quotients of 0.1 to 0.3) is estimated for the same exposures. Cancer risks estimates for all subareas are within EPA's targeted risk range of I E-04 to 1E-06, but are greater than the 1E-06 point of departure. All hazard quotients fall below the target level of one.

In subarea A and in Opportunity, cancer risks, calculated using averaged RME concentrations for groundwater, are in the same range as those for exposure to soil/dust. This is also true for non-cancer risks. Combined cancer and non-cancer risks suing averaged RME concentrations for groundwater and soil/dust (Subarea A and Opportunity) remain within the risk range, but are greater than the point of departure. This suggests that even where near maximum exposures to both groundwater and soil/dust occur simultaneously, exposures are not in excess of the targeted risk range established by EPA, but are greater than the point of departure.

Typically, EPA considers remedial action at a site when the excess cancer risk to any current or future

population falls within or exceeds the targeted risk range. EPA considers a risk of 1E-06 as the point of departure for evaluating remedial actions. Although the results of the risk assessment indicate that risks calculated for each subarea are all within EPA's targeted risk range, individual yards within a subarea having elevated concentrations of arsenic (hot spots) could preferentially pose an unacceptable risk to those residents. In addition, rural residential areas that were not adequately sampled to allow a calculation of risk, may also have hot spots that could pose an unacceptable risk. Thus, EPA believes a remedial action is necessary to address those individual residential areas or hot spots within the Community Soils OU.

EPA generally considers risk from exposure to lead unacceptable if more than 5% of the children have blood-lead levels in excess of 10 μg/dL (EPA 1994c). Modeling predicted that 5.3% of the children in Subarea E may have blood-lead levels in excess of 10 μg/dL. Although risk from lead exposure would be considered marginally unacceptable for exposure in Subarea E, use of conservative default assumptions in the IEUBK model have likely overestimated this risk. Thus, EPA will not address risks to lead at the Community Soils OU.

Actual or threatened releases of hazardous substances from individual yards or hot spots, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

6.11.1 ACTION LEVELS

As discussed above, EPA believes that individual residential areas or hot spots within the Community Soils OU may pose an unacceptable risk. EPA also

believes that the exposure estimates, considering uncertainties, calculated in the risk assessment are reasonable. Therefore, the range of screening levels (3 ppm to 297 ppm), that were developed for the targeted risk range of 1E-04 to 1E-06 in the risk assessment, are considered to be the appropriate range from which to select an action level for remediating hot spots.

First EPA determined that the appropriate remediation unit for a residential hot spot is the residential yard. The residential yard was chosen for the following reasons:

- Yards are an appropriate remediation management unit (i.e., property ownership);
- It is consistent with previous removal and remedial actions taken by EPA;
- Allows for consistent remediation of community and rural residential areas;
- Yards are defined as the unit to be addressed under the ADLC-DPS; and
- It is not unreasonable for an individual to remain in one residence for a long period of time, even a lifetime.

EPA then determined the arsenic action level for residential surficial soils to be 250 ppm. This corresponds to an excess cancer risk of 8E-05 and is within EPA's targeted risk range. Although the 250 ppm action level departs from EPA's 1E-06 point of departure, this action level is determined to be protective for the following reasons:

- The 250 ppm action level reflects detailed site-specific studies conducted in Anaconda that significantly reduce the uncertainty of the risk assessment. These studies provide site-specific

parameters to replace standard EPA default assumptions which generates a greater degree of confidence in the range of screening values.

- The range of screening values were developed from conservative exposure point concentrations in the risk assessment. Samples collected for the risk assessment were chosen from areas likely to contain elevated concentrations, not a random average of a particular area. These data potentially elevated the exposure point concentrations adding conservatism to the calculated screening values.
- The 250 ppm action level is applied to a much smaller exposure area than those evaluated in the risk assessment. Although the excess cancer risk (8E-05) for the 250 ppm action level is greater than the existing risk range for the subareas (1E-05 to 3E-05), it is applied to a much smaller exposure area than the subareas that were evaluated in the risk assessment. This significantly decreases the chance of averaging out a higher concentration value within a yard as compared to the larger subarea.

Cleaning up hot spots in excess of the 250 ppm action level is expected to reduce the overall risk in each subarea and the entire community of Anaconda to close to 1E-05 which approaches EPA's 1E-06 point of departure and the State of Montana's general goal of protection from environmental carcinogens at 1E-05.

In addition to the above, risk management considerations included the following:

- A 250 ppm action level was previously utilized in a removal action taken under the Community Soils OU; and
- A 250 ppm level is currently utilized in the Anaconda-Deer Lodge County Development Permit System.
- The 250 ppm action level incorporates a balancing of the NCP criteria used to select remedial actions that are protective, implementable and cost effective.

An arsenic action level of 500 ppm for surface soils and waste material in commercial/industrial land use areas was previously identified in the OW/EADA OU ROD, and was based in the OW/EADA Baseline Risk Assessment. For consistency at the Anaconda Smelter NPL Site, it is EPA's intent to continue to apply this action level at remaining commercial/industrial land use areas through this Community Soil ROD.

6.11.2 ECOLOGICAL RISK ASSESSMENT

Environmental risks were not assessed under this OU as this is currently being assessed in an ecological risk assessment under the ARWWS OU.

7.0 DESCRIPTION OF ALTERNATIVES

7.1 SUMMARY OF ALTERNATIVES

A brief description of the site cleanup alternatives that were considered in the Community Soils RI/FS Report (AGC 1996a) is provided below. These alternatives, initially presented in the Anaconda Smelter NPL Site Community Soils RI/FS Work Plan (ARCO 1994), were identified to meet the CERCLA Section 121 requirements for developing an appropriate range of options to undergo a detailed analysis. Alternatives identified in this section were selected based on the

site conditions, previous remedial actions at residential sites, and the results of previous technology scoping activities at other Clark Fork River NPL Sites. These activities included identification, screening, and evaluation of potential general response actions, remedial technologies, and process options in accordance with 40 C.F.R.§300.430 (e)(2)-(7).

The alternatives initially identified in the RI/FS Work Plan were modified in the FS analysis, as a result of additional information provided by the Soils Characterization Report and the Final Baseline HHRA. The alternatives were directed primarily at addressing residential yards, playgrounds and play areas, vacant lots, and parks where the public may have maximum exposure to contaminants (i.e., hot spots). In addition, alternatives were also directed at addressing railroad beds in the community of Anaconda. Alternatives were not developed specifically for commercial/industrial land use areas in the Community Soils FS. However, the alternatives developed for residential areas and railroad beds were appropriate for the commercial/industrial areas within this site. An explanation for the inclusion of commercial/industrial areas within this ROD is found in Section 11.0.

The remedial alternatives evaluated in the FS included two basic types of response actions: engineering controls and ICs. For residential soils, engineering controls included: in-place treatment, capping, and excavation and removal. ICs included a community education program designed to maintain existing or new engineering controls and a permitting program designed to clean up contaminated soils during new residential construction. For the railroad beds, engineering controls included: capping, separation barriers, and excavation and removal. Institutional Controls included private

property and governmental restrictions. In addition, the NCP *and* EPA guidance require EPA to consider a no action alternative as a baseline against which the other alternatives are compared.

All alternatives presented in the FS were evaluated against the nine criteria described in the next section, and then compared with each of the other options. A description of the alternatives is provided below.

7.2 DESCRIPTION OF ALTERNATIVES CONSIDERED FOR RESIDENTIAL SOILS

The engineering and ICs identified above for residential soils were developed and refined during the FS process and assembled into the four alternatives listed below to provide a range of options from no action to excavation and disposal. These alternatives were intended to address residential soils where concentrations of arsenic exceed the final action level (250 ppm) for residential use. For the purpose of costing alternatives in the FS and the Proposed Plan, 10 to 50 yards were assumed to exceed the action level. It was also assumed for costing purposes that soil contamination is limited to the top several inches of the surface and the depth of remediation (removal or treatment) would only need to be implemented to six inches. As noted, these alternatives are also suitable for addressing commercial/industrial areas.

Alternative I - No Action

Estimated present worth cost: 0
Implementation time: 0

The NCP and EPA guidance require that EPA consider the no action alternative. This alternative is used as a baseline against which to compare other alternatives. Under Alternative 1, no further action would be

undertaken. Contaminated soils would remain on site. The risk assessment was conducted to estimate risks posed by site soil to human health in the absence of a remedial action. Individual yard areas with elevated soil arsenic concentrations pose a risk requiring action, as described in Section 5.0.

Alternative 2 - Institutional Controls

Cost per yard: Not Applicable
Estimated present worth cost: $1,369,325
Implementation time: 6 months

This alternative entails the establishment of a Community Protective Measures Program (CPMP), comprised of an educational/informational component and existing ICs.

The education/informational component of this alternative would involve dissemination of written guidance for public agencies and residents describing risks and recommendations for addressing potentially contaminated soil. Information on concentrations of contaminants and their locations obtained through sampling would be maintained in a county database for public access. All soil sampling results and any pertinent changes in soil concentrations or covers would be recorded for use by regulators, prospective home buyers, lenders, contractors, and other interested parties. Additional educational measures would include the dissemination of materials designed to educate residents on the importance of maintaining a healthy lawn or adequate gravel cover on their property if they are within a designated area.

Existing ICs are those already included in the ADLC-DPS, within the Superfund Planning Area Overlay District. The DPS provides guidance on soils testing, soils remediation, and soils disposal in desig-

nated areas through the county's permit requirements and inspection procedures.

Alternative 3 - In-Place Treatment, Capping, and ICs

Cost per yard: $7,541
Estimated present worth cost: $1,394,731 - $1,496,358
Implementation time: 1 year

This remedial alternative consists of treating contaminated soils in residential yards by tilling to a depth necessary (6 inches assumed for costing purposes) to reduce arsenic concentrations to below the final risk-based action level for residential soils, and by adding soil amendments to further reduce the mobility of any remaining metals in the soil. The area would then be capped with soil, vegetation, gravel, or other equivalent barrier to protect the treated area. The ICs described in Alternative 2 would be used to promote maintenance of the cap and ensure proper handling of other soil on site.

Alternative 4 - Excavation and Disposal of Contaminated Soils and ICs

Cost per yard: $10,089
Estimated present worth cost: $1,420,216 - $1,623,778
Implementation time: 2 years

This alternative would consist of removing contaminated soils (6 inches assumed for costing purposes) in residential yards above the final risk-based action level for residential soils and proper disposal in a designated on-site soil management area. Excavated areas would be backfilled with clean material and capped with vegetation, gravel, or other equivalent barrier. The ICs described in Alternative 2 would also be used

to promote maintenance of the cap and ensure proper handling of other soils on site.

7.3 DESCRIPTION OF ALTERNATIVES CONSIDERED FOR RAILROAD BEDS

Three alternatives were developed and refined for the evaluation of railroad beds within the community of Anaconda. They are intended to address contaminated materials that were used to construct the railroad bed on the active railway operated by RARUS Railway Company, which runs through the residential portion of Anaconda. Concentrations of arsenic generally exceed 1,000 ppm throughout the profile and length of the railbed. Risks from these beds are generally limited to direct contact with contaminated material and the transport of contaminants to

* * *

8.2 EVALUATING THE RESIDENTIAL SOIL ALTERNATIVES

The following is a brief summary of the agencies' evaluation and comparison of residential soil alternatives. Additional details evaluating the alternatives is presented in the FS. This section evaluates the performance of the residential soil alternatives against the nine criteria discussed above, and compares it with the other possible options.

8.2.1 OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

This criterion is based on the level of protection of human health and the environment afforded by each alternative. All of the alternatives, with the exception of Alternative 1 (no action), are somewhat protective of human health and the environment. Although Alternative 2 is somewhat protective, it only relies on

compliance with county regulations, does not reduce arsenic concentrations under existing barriers or where barriers do not currently exist. Thus, it is not fully protective of human health and the environment In contrast, Alternatives 3 and 4 offer highly protective and irreversible remedies which would result in low residual concentrations of arsenic remaining in residential areas. Only Alternatives 3 and 4 are discussed further in this evaluation of alternatives.

The analysis of the other criteria indicate that Alternative 4 provides the greatest overall protection of human health with the greatest risk reduction (clean soil versus treat soil), as compared to Alternative 3. Alternative 4 best approaches EPA's risk point of departure at 1E-06 with the replacement of clean soil.

8.2.2 COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

This criterion is based on compliance with chemical-, location-, and action-specific ARARs. Alternatives 3 and 4 both comply with or attain identified state and federal ARARs.

8.2.3 LONG-TERM EFFECTIVENESS AND PERMANENCE

This criterion is based on the magnitude of residual risk and adequacy and reliability of controls. Alternatives 3 and 4 both employ permanent irreversible actions, resulting in lower arsenic concentrations remaining in the soil. However, Alternative 4 provides for the greatest reduction in residual concentrations through removal of contaminated soil and replacement with clean soil.

8.2.4 REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT

This criterion is based on the treatment process used, the amount of contamination destroyed or treated, the reduction of toxicity, mobility, and volume, the irreversible nature of the treatment, the type and quantity of residuals remaining, and the statutory preference for treatment. Only Alternative 3 uses a treatment process. This treatment (tilling and soil amendments) is expected to reduce arsenic concentrations in the upper soil surface to below the final risk-based action level and immobilize the arsenic and other metals present in the soil.

8.2.5 SHORT-TERM EFFECTIVENESS

This criterion is based on the degree of community and worker protection offered, the potential environmental impacts of the remediation, and the time until the remedial action is completed. Alternatives 3 and 4 both involve activities that have the potential to increase short-term risks. Such risks may result from a potential to generate arsenic-laden dust, to leave soils exposed for short periods of time, and to increase traffic of heavy vehicles in a residential area. Of these two alternatives, Alternative 3 involves a slightly lesser level of short-term risk, as in-place treatment will take a shorter time to implement than excavation and soil replacement, and will involve smaller and fewer pieces of equipment. However, EPA believes that any short-term risks associated with Alternatives 3 and 4, although minimal, can be effectively managed through careful planning and implementation.

8.2.6 IMPLEMENTABILITY

This criterion is based on the ability to perform construction and implement administrative actions.

Alternatives 3 and 4 involve administrative and construction activities that will require careful scheduling and coordination with the county and with homeowners, who would likely continue to occupy their homes during remediation. Implementation of Alternative 4 will require the import of soil cover, which would need to be identified during the design phase. Both Alternatives 3 and 4 would also require ICs to be implemented. All of these activities are readily implementable, and there is no real difference among the alternatives.

8.2.7 COST

Alternative 4 is slightly more expensive than Alternative 3.

8.2.8 STATE ACCEPTANCE

The State has been consulted throughout this process and concurs with the Selected Remedy.

8.2.9 COMMUNITY ACCEPTANCE

Public comment on the RI/FS and Proposed Plan was solicited during a formal public comment period extending from July 8 to August 9, 1996. Comments received from the community were generally in support of EPA's Preferred Alternative (Alternative 4). Comments from ARCO strongly favor Alternative 3.

8.2.10 SUMMARY

EPA has rated the relative performance of each alternative with respect to each criterion. Alternatives are rated to have an advantage (+) or disadvantage (-) when compared to other alternatives. A zero rating (0) is applied to an alternative having no distinct advantage or disadvantage over the other alternatives. The summary of EPA's rating of residential soil alternatives is shown in Table 12.

Of the residential soil alternatives presented in this ROD, only Alternatives 3 and 4 are fully protective of human health and the environment and thus, are discussed further in this section. Alternative 4 reduces residual soil arsenic concentrations to a greater degree than Alternative 3 (clean soil versus treated soil). Both Alternatives offer permanent and irreversible actions. Alternative 3 employs treatment while Alternative 4 does not. Both Alternatives are readily implementable, have similar short-term impacts, and are cost effective.

Both Alternatives would require invasive actions in residential yard areas. Alternative 4 would require additional action to bring in clean soil. Alternative 3 is estimated to cost less than Alternative 4, although cost differences are not considered significant. Sufficient uncertainty exists with Alternative 3 to require additional treatability testing to demonstrate cleanup effectiveness, cost, and implementability issues.

In comparing the relative performance of all criteria (Table 12), Alternative 4 has a slight advantage over Alternative 3. However, important differences, listed below, between the two alternatives have lead EPA and the State of Montana to strongly prefer Alternative 4.

- Alternative 4 provides the greatest level of protection and best approaches EPA's 1E-06 risk point of departure and the State of Montana's general goal of protection from environmental carcinogens at 1E-05. Note that although the relative performance rating for overall protection of human health and the environment was the same, the differences described above in regard to a threshold criteria can be significant.

- Alternative 4 utilizes a proven methodology. Although soil treatment under Alternative 3 has been demonstrated in reducing relatively high concentrations to moderate levels in large areas using large equipment, it has not been demonstrated to be effective for low concentrations, in confined areas using smaller equipment. Sufficient uncertainty exists with the implementability, effectiveness, and cost of Alternative 3.
- Cost differences between Alternative 4 and 3 are not significant in comparison to the benefits described above.

* * *

9.0 SELECTED REMEDY

Based upon consideration of CERCLA requirements, the detailed analysis of alternatives, and public comments, EPA has determined that the Preferred Alternative as presented in the Proposed Plan, with important modifications, is the appropriate remedy for the Community Soils OU. Modifications include specifying commercial/industrial soils for remediation in addition to residential soils and railroad bed materials, as presented in the Proposed Plan. This Selected Remedy will reduce risk to human health through the following:

- Reduction of surface soil arsenic concentrations to acceptable levels, and
- Prevention of direct human contact with waste materials (i.e., railroad beds).

While certain other alternatives may better satisfy certain individual selection criteria, the Selected Remedy best meets the entire range of selection criteria and achieves, in EPA's determination, the appropriate

balance considering site-specific conditions and criteria identified in CERCLA and the NCP, as provided in Section 10.0, Statutory Determinations.

9.1 REMEDY FOR RESIDENTIAL SOILS

The Selected Remedy will address all remaining residential soils within the site, through the following:

1. Clean up all current residential soils within the Anaconda Smelter NPL Site that exceed the residential action level of 250 ppm soil arsenic concentration, through removal and replacement with clean soil and a vegetative (e.g., new sod or seed) or other protective barrier (e.g., asphalt pavement, concrete sidewalks).

- Residential soils include yards, parks, school grounds, or other play areas. Also included are barren driveways, alleys, or other common areas adjacent to yards which may contribute to the contamination of yards and which may be frequented by children.
- Based on soils characterization in the RI/FS report, all current and reasonably anticipated future residential areas within the Anaconda Smelter NPL Site that are estimated to exceed 250 ppm soil arsenic concentration, have been identified as the "Focus Area" for cleanup (Figure 4 and Exhibit 1).
- The cleanup activities will be directed toward or initiated in residential areas that are within the Focus Area.
- The cleanup activities will provide for opportunistic sampling and remediation of potentially contaminated soils outside the Focus Area (i.e., individual areas that exceed 250 ppm soil arsenic concentration, or areas suspected of

having contaminated material present from the railroad bed or other sources) on a limited basis.

- Residential soils to be cleaned up (those that exceed 250 ppm soil arsenic concentration) will be determined by sampling. Consideration will also be given to the permanence of existing barriers and ICs (e.g., use restrictions, maintenance, etc.) in determining which residential soils will be remediated.
- In areas where soil removal is to be implemented, only the depth of soil that is greater than 250 ppm soil arsenic concentration, to a maximum of 18 inches, will be removed (Figure 8). The maximum 18-inch depth is based upon possible activities that might be conducted in a yard (i.e., garden, play area or other excavation).
- In areas where site-specific conditions dictate that removal is not implementable (i.e., yard size, topography, rocks, trees, etc.), other measures (i.e., capping, tilling, ICs, etc.) will be taken to reduce arsenic concentrations to below the 250 ppm action level or prevent exposure.
- Removed soils will be disposed of in a designated on-site soil management area.

2. Implement ICs to clean up future residential areas.

- Clean up all future residential soil areas within the Focus Area that exceed the residential action level of 250 ppm soil arsenic concentration at the time of development, through the ADLC-DPS. The ADLC-DPS will continue to require soil sampling at all new residential construction within the Superfund Planning

Area Overlay District. Soils exceeding the 250 ppm soil arsenic concentration will be cleaned up through the DPS with preference given to removal.

- The current ADLC Superfund Planning Area Overlay District will be expanded, where necessary, to include the Focus Area.
- In areas where site-specific conditions dictate that removal is not implementable, other measures (i.e., capping, tilling, ICs, etc.) will be taken to reduce arsenic concentrations to below the 250 ppm action level or prevent exposure.

3. Implement ICs to provide educational information to all residents describing potential risks and recommendations to reduce exposure to remaining contaminated soils.

- Develop a CPMP, to be managed by ADLC, to provide educational information to residents within the ADLC Superfund Planning Overlay District describing risks and recommendations to reduce exposure to residual contaminants (>250 ppm) in soils (i.e., the importance of maintaining a healthy lawn or other protective cover).
- Information on soil arsenic concentrations and locations will be maintained in an ADLC database for public access. All sampling results and pertinent changes in soils and condition of existing covers will be recorded for use by regulators, prospective home buyers, lenders, contractors, and other interested parties.

4. Institute operation and maintenance activities as necessary.

* * *

9.4 CLEANUP LEVELS

The purpose of this response action is to control risks posed by direct contact with all residential soils and waste materials (i.e. railroad beds) within community areas of the Anaconda Smelter NPL Site. Although the results of the risk assessment indicate that risks calculated for each subarea are all within EPA's targeted risk range, individual yards within a subarea having elevated concentrations of arsenic (i.e., hot spots) could preferentially pose an unacceptable risk to those residents. In addition, rural residential areas that were not adequately sampled to allow a calculation of risk, may also have hot spots that could pose an unacceptable risk. Thus, EPA believes a remedial action is necessary to address those individual residential areas or hot spots within the Community Soils OU.

Since no federal or state ARARs exist for soil arsenic or waste material, an action level was determined through site-specific analysis. The analysis used the Final Baseline HHRA (CDM Federal 1996a) to develop a range of screening levels that corresponded to risks within EPA's target risk range of 1E-04 to 1E-06. The action level for residential soils is 250 ppm soil arsenic concentration. This corresponds to an excess cancer risk of 8E-05 and is within EPA's targeted risk range.

All residential soils in excess of the action level will be addressed by the Selected Remedy. In individual yards where the Selected Remedy is implemented, the cleanup level is expected to approach 1E-05 with the replacement of clean soil. In addition, cleaning up individual yards in excess of the 250 ppm action level is expected to reduce the overall risk in each subarea

and the entire community of Anaconda to close to 1E-05 which approaches EPA's 1E-06 point of departure and the State of Montana's general goal of protection from environmental carcinogens at 1E-05.

The action level for commercial/industrial soils is 500 ppm soil arsenic concentration. This corresponds to an excess cancer risk of approximately 6E-05 and is within EPA's targeted risk range. This action level is a continued application of the commercial/industrial action level established under the OW/EADA ROD (EPA 1994a). Although no areas were identified in the RI/FS, both current and future properties may be identified during Remedial Design. Commercial/ industrial areas where the Selected Remedy is implemented, the cleanup level at the surface is expected to approach 1E-05 through the use of engineered covers.

No action level was developed for addressing the railroad bed materials within the community of Anaconda. Concentrations of arsenic throughout the profile of the railbed material generally exceed 1000 ppm. Because the railbed material is located within the community of Anaconda, the above action levels of 250 and 500 ppm for residential and commercial/ industrial areas, respectively, are applied to the railbed material. Where the Selected Remedy is implemented to railbed material, the cleanup level at the surface is expected to approach 1E-05 through the use of engineered covers.

9.5 REMEDIATION REQUIREMENTS

The remediation requirement for residential soils is to reduce surface arsenic concentrations to below 250 ppm. The remediation requirement for contaminated railroad bed materials is to prevent direct contact with, and reduce potential for erosion and transport

of, contaminated material to residential areas. The specific remediation requirements of the Selected Remedy are to:

- Reduce soil arsenic concentrations in residential areas to below 250 ppm through removal and replacement with clean soil and a vegetative or other protective barrier.
  - Current residential areas with soils exceeding 250 ppm soil arsenic concentration shall be identified through sampling during Remedial Design. Existing barriers and ICs (e.g., use restrictions, maintenance, etc.) will also be evaluated to identify soils requiring remediation.
  - All identified residential soils exceeding 250 ppm soil arsenic concentration shall be removed to a maximum depth of 18 inches.
  - Clean soil, as determined by EPA, shall be used to replace removed soils. Soils shall be of sufficient quality to support a vegetative or other protective barrier.
  - Protective barriers shall be designed to protect the replaced soils and/or provide an effective and permanent barrier to contaminated soils or waste materials.
  - Vegetative barriers shall be of sod or seed in consideration of land use.
  - Removed soils shall be disposed of in a protective manner.
- Reduce arsenic concentrations at the surface to below 500 ppm in current industrial or commercial areas using a combination of Revegetation techniques and/or engineered covers.

- Revegetation techniques, which may include deep tilling, lime additions, or soil amendments, shall be implemented to reduce surface soil arsenic concentrations to below 500 ppm and establish a diverse, effective, and permanent vegetative cover.
- Engineered covers shall be designed to provide an effective and permanent barrier to waste materials. Soil covers shall be stabilized with Revegetation that provided a diverse, effective, and permanent cover.

• Develop ICs to restrict and manage future land use.

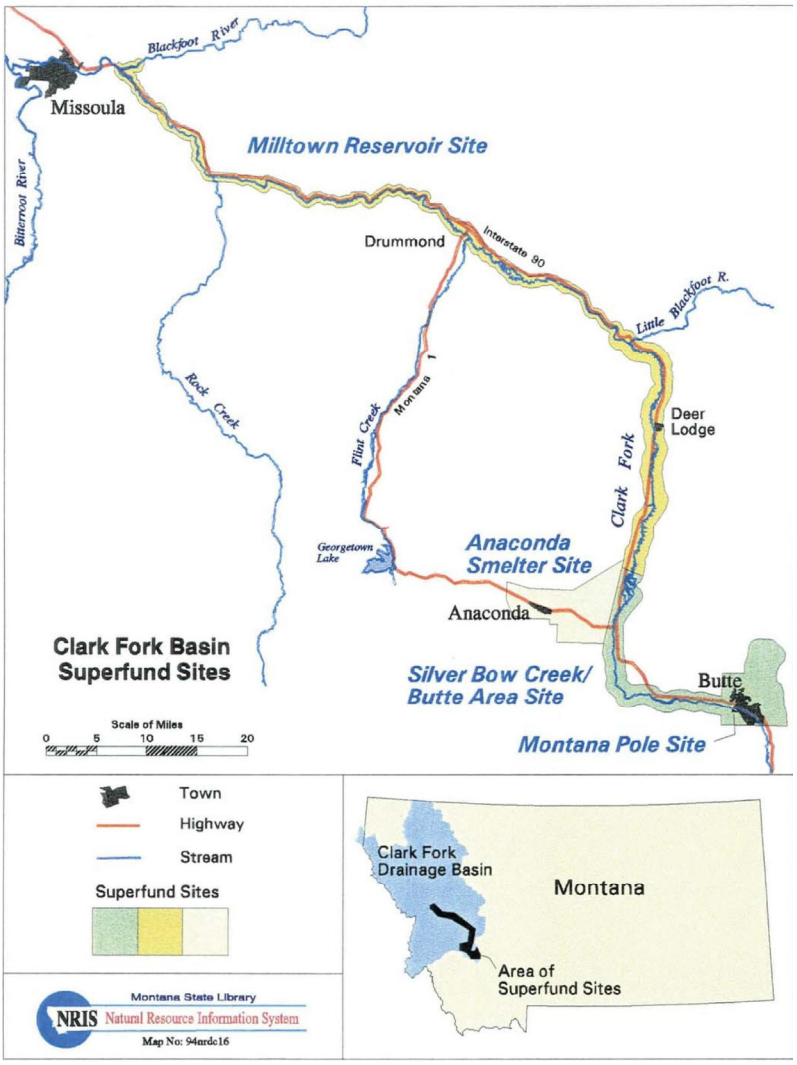
- Assure that future land use at the site is consistent with EPA's determination of the health and environmental risks posed by contaminants left on site.
- Provide for the preservation and maintenance of Superfund remedial structures on the site, including but not limited to caps, beams, waste repositories, and vegetated areas.
- Require that future development at the site employ construction practices that are consistent with the protection of public health and the environment, as determined by Superfund remedial actions.
- Remedied, as development occurs at the site, soil arsenic contamination to levels appropriate for the intended use, as determined by Superfund remedial actions.
- Provide for implementation of other laws applicable to development, such as subdivision and floodplain requirements.

- Design engineered covers to prevent direct contact with, and reduce potential for erosion and transport of, contaminated railroad bed materials.
  - Engineered covers shall be designed to provide an effective and permanent barrier to waste materials.
- Design engineered barriers to restrict access to railroad bed and to control surface runoff.
  - Barriers shall be designed to prevent contaminated railbed material from eroding to adjacent residential areas.

* * *

Figure 1

Anaconda Smelter NPL Site Location Map with Approximate Site Boundary



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1.0 INTRODUCTION

The U. S. Environmental Protection Agency (EPA) has prepared this Responsiveness Summary in conjunction with the Record of Decision (ROD) to document and respond to issues and comments raised by the public regarding the Remedial Investigation/Feasibility Study (RI/FS) and the Proposed Plan for the Community Soils Operable Unit (OU) of the Anaconda Smelter National Priorities List (NPL) Site. Comments were received during the Public Comment Period from July 8 through August 9, 1996. These comments, and responses to them, are outlined in this document. By law, the EPA must consider public input before making a final decision on a cleanup remedy. Once public comment is addressed, the final decision on a cleanup remedy will be documented in the ROD.

1.1 COMMUNITY INVOLVEMENT BACKGROUND

EPA has conducted community involvement activities for the Community Soils OU in accordance with state and federal laws and EPA Superfund guidance documents. From the beginning of the RI/FS process for the Community Soils OU, EPA has conducted community relations activities and sought the involvement of the public and the Potentially Responsible Party (PRP), Atlantic Richfield Company (ARCO).

1.2 PUBLIC MEETING PUBLICITY

Press releases were sent to *The Anaconda Leader* to announce each public meeting and the Public Comment Period. The public meetings were then advertised in this newspaper. Print advertisements were display style, conspicuously large (quarter page), and were placed in a widely-read section of the paper.

1.3 ADMINISTRATIVE RECORD

The Administrative Record is the set of documents identified for the Community Soils OU upon which the selection of the remedy is based. The Administrative Record is required by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) §113(k). The Administrative Record (on microfilm) is available for public review at the Hearst Free Public Library in Anaconda, and the Montana Tech Library in Butte, with the complete Administrative Record located at the EPA Records Center in Helena.

1.4 DOCUMENT REPOSITORIES

Key documents relating to the Community Soils OU are also available at the Hearst Free Public Library in Anaconda and at the EPA Records Center in Helena.

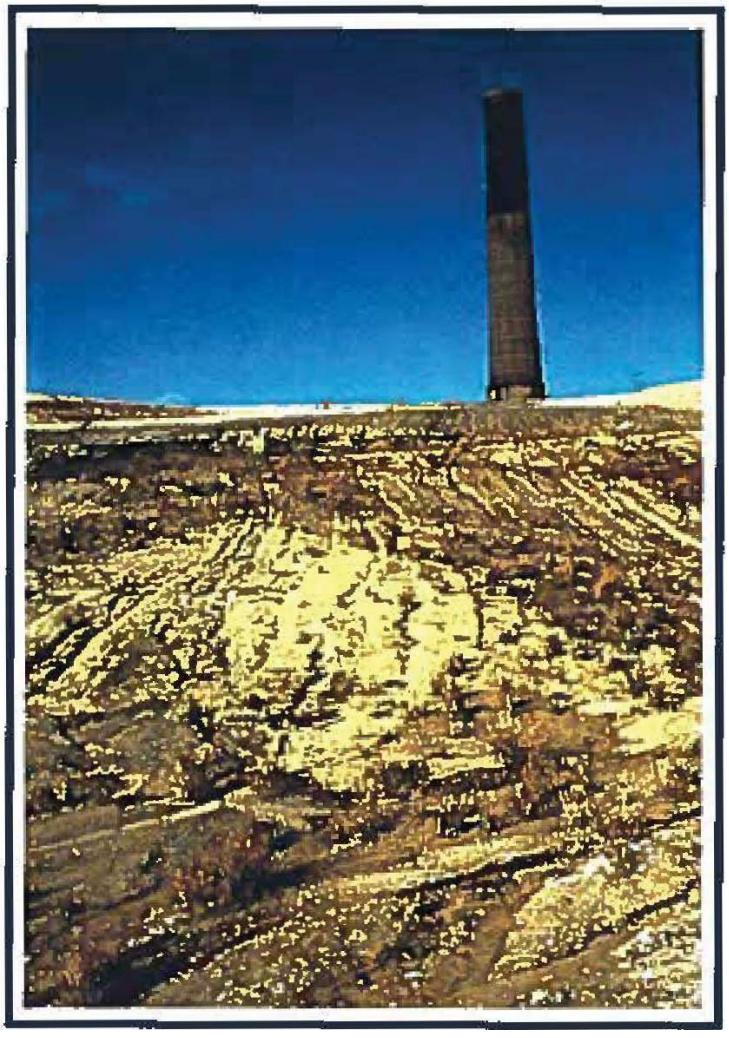
* * *

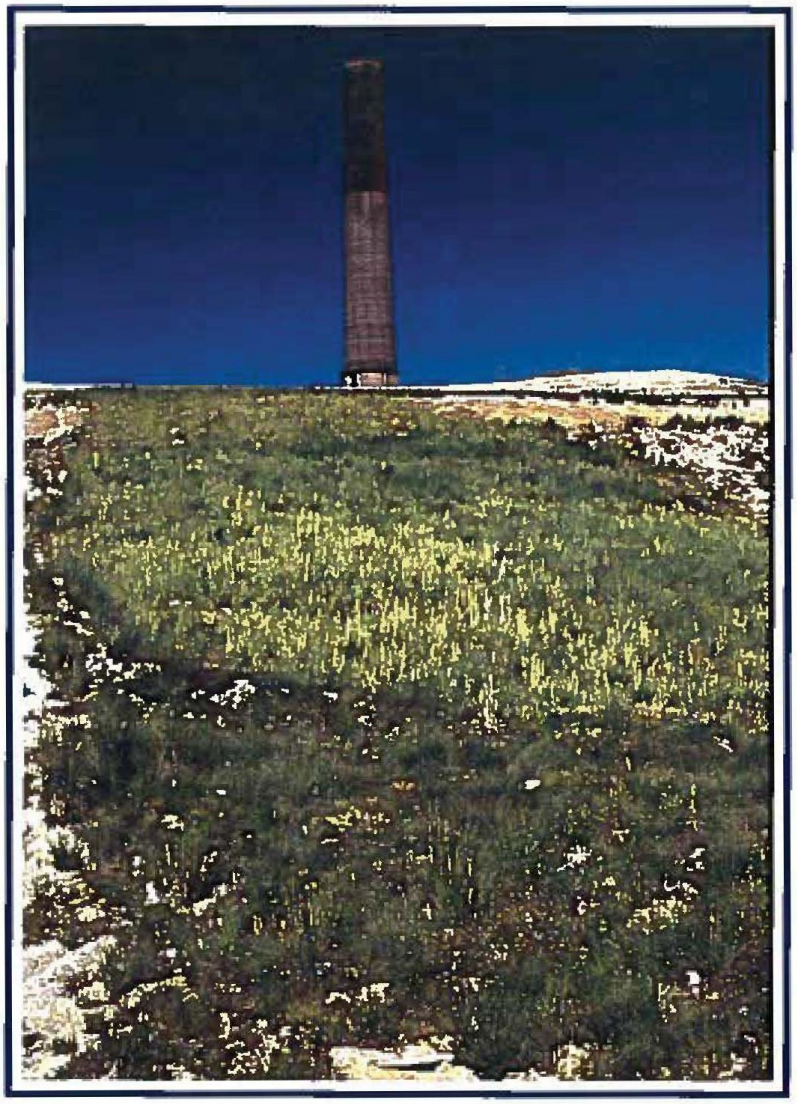
[Anaconda Regional Water, Waste, and Soils OU ROD (Sept. 1998)]

RECORD OF DECISION

ANACONDA REGIONAL WATER, WASTE, AND SOILS OPERABLE UNIT

Anaconda Smelter National Priorities List Site
Anaconda, Montana





SEPTEMBER 1998

U.S. Environmental Protection Agency and
Montana Department of Environmental Quality

DECLARATION

SITE NAME AND LOCATION

Anaconda Smelter NPL Site
Anaconda. Deer Lodge County Montana
Anaconda Regional Water. Waste. and Soils ARWW&S) Operable Unit (OU)
CERCLIS ID #MTD 093291656

STATEMENT OF BASIS AND PURPOSE

This decision document presents the Selected Remedy for the last OU, the ARWW&S OU, of the Anaconda Smelter NPL Site in Deer Lodge County, Montana. EPA. with the concurrence of MDEQ, selected the remedy in accordance with CERCLA and the NCP.

This decision is based on the Administrative Record for the ARWW&S OU of the Anaconda Smelter NPL Site. The Administrative Record ton microfilm) and copies of key documents are available for public review at the Hearst Free Library. located on the corner of Fourth and Main in Anaconda. Montana. and at the Montana Tech Library in Butte. Montana. The complete Administrative Record may also be reviewed at the EPA Records Center in the Federal Building, 301 South Park, in Helena. Montana.

The State of Montana concurs with the Selected Remedy, as indicated by its signature.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances at and from the ARWW&S OU, if not addressed by implementing the response action selected in this ROD. may present an imminent and substantial endangerment to public health. welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The ARWW&S OU is the fifth OU to receive remedial action at the Anaconda Smelter NPL Site. The first remedial action. taken at the Mill Creek OU, involved the relocation of residents from the community of Mill Creek after other initial stabilization and removal efforts. The second remedial action. taken at the Flue Dust OU, addressed flue dust at the site through removal, treatment. and containment. At approximately the same time. removal actions were undertaken, including permanent removal and disposal of Arbiter and beryllium wastes and the selective removal of contaminated residential yard materials from the community of Anaconda. The third remedial action addressed various waste sources found within the Old Works/East Anaconda Development Area (OW/EADA) OU, located adjacent to the community of Anaconda. and in areas of future development, and followed an initial removal action in the same area. Certain wastes within the OW/EADA OU received an engineered cover, including the Red Sands waste material and the Heap Roast slag piles. while others were consolidated and/or covered. including the floodplain wastes and miscellaneous waste piles. In addition. the third action allowed economic development (i.e. construction or a golf course in the Old Works area) and provided the final response action at the Mill Creek OU.

The fourth remedial action, the Community Soils OU, addressed all remaining residential and commercial/industrial soils within the Anaconda Smelter NPL Site. The principal contaminant of concern (COC) at the Community Soils OU is arsenic in surficial soils from past aerial emissions and railroad beds constructed of waste material.

This remedial action at the ARWW&S OU will address all remaining cleanup decisions for the Anaconda Smelter NPL Site. It will also address potential impacts to surface and ground water from soils and waste sources such as tailings and slag as well as human and environmental risks associated with arsenic contaminated soils that have not been addressed by other response actions.

The Selected Remedy for the ARWW&S OU is comprised of several remedies for the waste media types found throughout the OU. The major components of these remedies are described below.

Soils and Waste Materials

Major components of the remedy for contaminated soils and waste material include:

- Reduction of surficial arsenic concentrations to below the designated action levels of 250 parts per million (ppm), 500 ppm, and 1,000 ppm through a combination of soil cover or *in situ treatment.*
- Reclamation of the soils and waste area contamination by establishing vegetation capable of minimizing transport of COCs to ground water and windborne and surface water erosion of the contaminated soils and waste areas. This vegetation will also provide habitat consistent with surrounding and designated land uses.
- Partial removal of waste materials followed by soil cover and revegetation for areas adjacent to streams. Removed material will be placed within designated Waste Management Areas (WMAs).

Ground Water

Major components of the remedy for ground water include:

- For alluvial aquifers underlying portions of the Old Works and South Opportunity Subareas, clean up to applicable State of Montana water quality standards through use of soil covers and removal of sources (surface water) to ground water contamination and natural attenuation.
- For the bedrock aquifers and a portion of the alluvial aquifer in the Old Works/Stucky Ridge and Smelter Hill Subareas, waiver of the applicable ground water standard. The aquifers underlying these subareas cannot be cost effectively cleaned up through reclamation, soil cover, or removal of the sources (wastes, soils, and tailings) of the around water contamination. Reclamation of soils and waste source areas with revegetation is required, which will contribute to minimizing arsenic and cadmium movement into the aquifers.
- For portions of the valley alluvial aquifers underneath the Old Works/Stucky Ridge, Smelter Hill, and Opportunity Ponds Subareas where around water is underlying waste-left-in-place, point-of-compliance (POC) monitoring to ensure contamination is contained at the perimeter boundary of the designated WMA. Should POC monitoring show a spread of contaminants beyond the boundary of a WMA. institute treatment options for the ground water where practicable.

Surface Water

Major components of the remedy for surface water include:

- Reclamation of contaminated soils and engineered storm water management options to control overland runoff into surface waters.
- Selective source removal and stream bank stabilization to minimize transport of COCs from fluvially deposited tailings into surface waters. Removed material will be place within a designated WMA.

Institutional Controls (ICs) and Operations and Maintenance (O&M)

- The remedy will employ ICs and long-term O&M for the OU to ensure monitoring and repair of implemented actions. These actions will be coordinated through development of an ICs Plan and O&M Plan and will allow for communication with local government and private citizens. The plans will function as a tracking system for the agencies and describe and plan for potential future land use changes.
- The remedy calls for a fully-funded ICs program at the local government level. The Anaconda-Deer Lodge County (ADLC) government will be responsible for on-going oversight of O&M in the OW/EADA OU, implementation of a county-wide Development Permit System (DPS), and provision of public information and outreach through a Community Protective Measures program.
- In addition, the remedy will bring closure to previous response actions within the site that

are already implemented. such as the Flue Dust remedy or the Old Works remedy, primarily through long term O&M for some or all of those actions which are integrated into this remedy.

Remedial Design/Remedial Action Management

The ARWW&S OU encompasses a very large area. with Remedial Action slated for approximately 20.000 acres. The size of the OU and the focus on land reclamation as the key remedy will require management tools during Remedial Design/Remedial Action (RD/RA) activities to help direct. prioritize. and sequence response actions and allow for changing community interests. Management of the OU can be accomplished with the following elements:

- Site Management Plan (SMP) - The SMP will provide a framework for future RD/RA activities and will incorporate remedial unit designations and sequencing criteria for the RD/RA actions.
- Historic Preservation and Mitigation Plan - Final implementation of the Regional Historic Preservation Programmatic Agreement will be accomplished. Separate agreements to address tribal cultural resources will be included.
- Wetlands Mitigation - Assessment and mitigation of impacts to wetlands from implementation of the remedy and communications with U.S. Fish and Wildlife Service will be coordinated.

The Selected Remedy will achieve reduction of risk to human health and the environment through the following:

- Preventing human ingestion of, inhalation of dust from, or direct contact with, contaminated soil and/or waste media where such ingestion or

contact would pose an unacceptable health risk for the designated land use.

- Stabilization of contaminated soil and waste material against wind and surface erosion.
- Minimizing transport of contaminants to ground water and surface water receptors.

STATUTORY DETERMINATIONS

The Selected Remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy uses permanent solutions (e.g., reclamation, soil removal and engineered covers) and alternative treatment technologies to the maximum extent practicable for this site.

Since hazardous substances above health-based risk levels will remain on site (in WMAs), periodic reviews will be conducted throughout the remedial action and upon its completion to ensure that the remedy continues to provide adequate protection of human health and the environment.

/s/ Max H. Dodson
Max H. Dodson, Assistant Regional Administrator
Ecosystems Protection and Remediation
U.S. Environmental Protection Agency, Region VIII

9/29/98
Date

/s/ Mark A. Simonich
Mark A. Simonich, Director
Montana Department of Environmental Quality

9/28/98
Date

* * *

4.0 SCOPE AND ROLE OF OPERABLE UNIT

The Anaconda Smelter NPL Site is currently organized with respect to the following actions:

- Anaconda Smelter Demolition and Initial Stabilization Actions;
- Mill Creek Children Relocation Removal Action;
- Mill Creek Relocation Remedial Action;
- Anaconda Yards Time Critical Removal Action;
- Arbiter Non-Time Critical Removal/Beryilium Non-Time Critical Removal Action and Repository Construction;
- Old Works Stabilization Removal Action;
- Flue Dust Remedial Action;
- OW/EADA Remedial Action;
- Community Soils Remedial Action; and
- ARWW&S OU Remedial Action.

The actions were prioritized based on their potential risk to human health and the environment. Mill Creek was considered the highest priority and EPA relocated Mill Creek residents in 1988. Since then. EPA has also taken action at several other areas. including, Flue Dust. Arbiter. Beryllium. OW/EADA, and Community Soils. These actions were prioritized for action based on principle threat human health risks (Flue Dust), immediate economic development requirements (OW/EADA), and potential exposure of remaining residents to elevated arsenic soil concentrations (Community Soils).

As noted in Section 2.0. Operable Unit History and Enforcement Activities, the site has been organized and OUs prioritized since 1988. with the Conceptual Site Management Plan attached to the AOC V111-88-16. This order was formally revised in October 1995. with the Community Soils and ARWW&S OUs identified for remaining ROD completion. A brief description of the ARWW&S OU is provided below:

The ARWW&S OU combines the former ARWW, Anaconda Soils, and Smelter Hill OUs in a final site-wide RI/FS. Independent Remedial Actions will not be required under the Anaconda Soils and Smelter Hill OUs. The ARWW&S OU is intended to be the last comprehensive OU of the Anaconda Smelter NPL Site by addressing all remaining issues not addressed under other remedial actions. This OU will continue to address potential impacts to surface and ground water from soils and waste sources such as tailings and slag. This OU will address both the human and environmental risks associated with site-related contamination that have not been addressed by other OUs.

The purpose of the RIs and FS Deliverables for the ARWW&S OU was to gather sufficient information to support informed risk management decisions for remediation of all the remaining human and ecological health risks at the Anaconda NPL Site. The RIs and FS Deliverables were performed in accordance with the NCP, 40 CFR Part 300, arid CERCLA.

The objectives of the RIs and the r5 Deliverables were to:

- characterize to the extent necessary, the nature anti extent of arsenic and metal contamination in soil, waste material, surface water, ground

water and air in each subarea and area or concern throughout the ARWW&S OU:

- identify potential receptors. exposure pathways and food chain relationships;
- estimate human health and ecological risk due to exposures to arsenic and metal contaminated media;
- identify the current or reasonably anticipated future land use that may require development of remedial alternatives;
- screen and evaluate each of the remedial action alternatives defined in the FS deliverables against the NCP remedy selection criteria (40 CFR §300.430); and
- compare the relative performance among each alternative with respect to the evaluation criteria.

The remedy outlined in this ROD is intended to be the final remedial action for the ARWW&S OU. It is also intended to be the final remedial action for all remaining waste in the Anaconda Smelter NPL Site.

[Administrative Order for Remedial Action (Community Soils OU, Residential Soils Remedial Design Unit) (Aug. 21, 2002)]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION VIII

EPA Docket No. CERCLA-08-2002-08

IN THE MATTER OF:

ANACONDA SMELTER SUPERFUND SITE, COMMUNITY SOILS OPERABLE UNIT, RESIDENTIAL SOILS REMEDIAL DESIGN UNIT

ATLANTIC RICHFIELD COMPANY,

Respondent.

PROCEEDING UNDER SECTION, 106(a) OF THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT, AS AMENDED, 42 U.S.C. § 9606(a).

ADMINISTRATIVE ORDER FOR REMEDIAL ACTION

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ATTACHMENTS

Exhibit 1. Record of Decision for Community Soils Operable Unit, September 25, 1996

Exhibit 2. Residential Soils Remedial Design Unit Remedial Action Work Plan/Final Design Report, July 19, 2002

I. INTRODUCTION AND JURISDICTION

1. This Order directs Respondent to perform a remedial action for the Residential Soils Remedial Design Unit, which is within the Community Soils Operable Unit (CS OU) of the Anaconda Smelter Superfund Site. This Order is issued to Respondent by the United States Environmental Protection Agency (EPA) under the authority vested in the President of the United States by section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. § 9606(a), as amended (CERCLA). This authority was delegated to the Administrator of EPA on January 23, 1987, by Executive Order 12,580, 52 Fed. Reg. 2,923, and was further delegated to EPA Regional Administrators on September 13, 1987, by EPA Delegation No. 14-14-B. This authority has *been* further delegated to the Assistant Regional Administrator, Office of Ecosystems Protection and Remediation.

II. FINDINGS OF FACT

2. The Respondent, the Atlantic Richfield Company (ARCO), is a corporation doing business in the State of Montana. It is currently organized under the laws of the State of Delaware. Respondent is an affiliate of BP Corporation North America, Inc.

a. The Respondent is now, and has been since on or about 1977, the owner and operator of the "facility," as defined below.

b. As a result of one or more mergers, restructurings, transfers of assets, continuations of business activities, or other corporate action, the Respondent is the successor-in-interest to, and has assumed the liabilities incurred by the Anaconda Copper Mining Company and/or its subsidiaries and related corporations or businesses, including historical predecessors.

3. Pursuant to section 105 of CERCLA, 42 U.S.C. § 9605, EPA placed the Anaconda Smelter Superfund Site, including the CS OU, on the National Priorities List set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on September 8, 1983, 48 Fed. Reg. 40658.

4. EPA divided the Site into operable units (OUs), including the CS OU, for response.

5. From 1995 to 1996, ARCO, with EPA oversight, undertook a Remedial Investigation and Feasibility Study (RI/F^{S}) for the CS OU, pursuant to CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300 (NCP).

6. Studies performed as part of the RI/FS for the CS OU documented the presence, release, and threat of release of arsenic, cadmium, and lead in residential soils.

7. These studies documented that humans are at risk from exposure through the inhalation pathway to the contaminated residential soils. Additional information on the human health risks at the CS OU is presented in the Final Baseline Human Health Risk Assessment for the CS OU, January 1996.

8. In accordance with section 117 of CERCLA, 42 U.S.C. § 9617, EPA published notice of the completion of the FS and of the proposed plan for remedial action on July 8, 1996 and provided an opportunity for public comment on the proposed remedial action.

9. EPA's remedial: action decision for the CS OU is embodied in a Record of Decision (ROD), executed on September 25, 1996 with concurrence by MDEQ, Exhibit 1. The ROD is supported by an administrative record that contains the documents and information upon which EPA based the selection of the response action.

10. EPA divided the CS OU into remedial design units (RDUs). The Residential Soils RDU consists of all soils in current residential areas anywhere within the Anaconda Smelter Superfund Site, an area of approximately 300 square miles in southern Deer Lodge Valley, including the town of Anaconda and surrounding foothills.

11. From about October 1996 to July 2002, ARCO, with EPA oversight, completed the Remedial Action Work Plan/Final Design Report (RAWP/FDR) for the Residential Soils RDU, pursuant to Administrative Order on Consent, Docket No. CERCLA-VIII-88-16, Amendment 11.

12. EPA's remedial design and remedial action decision for the Residential Soils RDU is embodied in the Final Remedial Action Work Plan/Final Design Report, Exhibit 2 (RAWP/FDR), approved on July 19, 2002, with concurrence by MDEQ.

13. This Order addresses all soils in current residential areas within the Residential Soils RDU.

III. CONCLUSIONS OF LAW AND DETERMINATIONS

14. Based on the preceding Findings of Fact and the administrative record for the Site, EPA has made the following conclusions of law and determinations:

a. The Site, the CS OU, and the Residential Soils RDU are "facilities" as defined in section 101(9') of CERCLA, 42 U.S.C. § 9601(9);

b. Respondent is a "person" as defined in section 101(21) of CERCLA, 42 U.S.C. § 9601(21);

c. Respondent is a liable party under sections 104 and 107 of CERCLA, 42 U.S.C. §§ 9604 and 9607, and is subject to this Order under section 106(a) of CERCLA, 42 U.S.C. § 9606(a);

d. Substances found at the Site, the CS OU, and the Residential Soils RDU are "hazardous substances" as defined in section 101(14) of CERCLA, 42 U.S.C. § 9601(14);

e. The presence of hazardous substances at the Site, including the CS OU and the Residential; Soils RDU, and the past, present, or potential future migration of hazardous substances described in Section II of this Order constitutes an actual or threatened "release" as defined in section 101(22) of CERCLA, 42 U.S.C. § 9601(21);

f. The actual or threatened release of one or more hazardous substances from the facilities may present an imminent and substantial endangerment to public health or welfare or the environment; and

g. The actions required by this Order are necessary to protect the public health and welfare and the environment.

IV. NOTICE TO THE STATE

15. EPA has notified the State of Montana (State), through the Montana Department of Environmental Quality (MDEQ), of this action pursuant to section 106(a) of CERCLA, 42 U.S.C. § 9606(a), and provided for State involvement in the initiation, development, and selection of the remedial action, and will continue to provide for State involvement in design and implementation of the remedy, in accordance with section 121(f) of CERCLA, 42 U.S.C. § 9621(f). All EPA decisions under this Order will be made in consultation with MDEQ. EPA is the lead agency for coordinating, overseeing, and enforcing the response action required by this Order.

V. ORDER

16. Respondent is hereby ordered to comply with all requirements of this Order, including but not limited to all attachments to this Order and all documents incorporated by reference into this Order.

VI. DEFINITIONS

17. Unless otherwise expressly provided herein, terms used in this Order which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCIA or such regulations. Whenever terms listed below are used in this Order or in the documents attached to this Order or incorporated by reference into this Order, the following definitions shall apply:

"Contractor" means any person, including the contractors, subcontractors, consultants, or agents retained or hired by Respondent to undertake any Work under this Order.

"Day" means calendar day. In computing any period of time under this Order, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the end of the next working day. Time will be computed in accordance with Rule 6 of the Federal Rules of Civil Procedure, unless otherwise specified.

"Deliverable" means any written product, including but not limited to, plans, reports, memoranda, data, and other documents that Respondent must submit to EPA under this Order.

"NCP" means the National Oil and Hazardous Substances Pollution Contingency Plan promulgated under section 105 of CERCLA, 42 U.S.C. § 9605, and codified at 40 C.F.R. Part 300, including any amendments thereto.

"Operation and Maintenance" or "O&M" means all activities required under the Operation and Maintenance Plan presently being developed by Respondent as required under Administrative: Order on Consent, Docket No. CERCLA-VIII-88-16, Amendment 13. Upon approval by EPA, the portions of that Operations and Maintenance Plan applicable to the Residential Soils RDU are incorporated by reference and become enforceable as part of this Order.

"Order" means this Order, the exhibits attached to this Order, the EPA-approved work plan, and all documents incorporated into this Order by reference or according to the procedures set forth herein.

"Performance Standards" means those cleanup standards, standards of control, and other substantive requirements, criteria or limitations, identified in the CS OU ROD, Exhibit 1, and/or the Residential Soils RAWP/FDR, Exhibit 2, that the remedial

action and other Work performed under this Order must attain and maintain.

"Record of Decision" or "ROD" means the EPA Record of Decision for the CS OU of the Anaconda Smelter Superfund Site, executed on September 25, 1996, and all attachments thereto, attached hereto as Exhibit 1, and incorporated herein by reference.

"Remedial Action" or "RA" means those activities, except for operation and maintenance, to be undertaken by Respondent to implement the final plans and specifications embodied in the Residential Soils RAWP/FDR, including any additional activities required under Sections X, XI, X11, XIII, and XIV of this Order.

"Remedial Design" or "RD" means the Residential Soils RAWP/FDR, attached hereto as Exhibit 2, and incorporated herein by reference.

"Site" means all current residential soils within the Anaconda Smelter Superfund site, as more particularly described in the ROD, Exhibit 1, and the Residential Soils RAWP/FDR, Exhibit 2.

"Work" means all activities Respondent is required to perform under this Order, including remedial action, operation and maintenance, and any other activities necessary to fulfill the requirements of this Order.

VII. NOTICE OF INTENT TO COMPLY

18. ARCO shall provide, not later than 7 days after the effective date of this Order, written notice to the EPA Remedial Project Manager stating whether it will unconditionally and unequivocally comply with this Order. If Respondent does not unconditionally and unequivocally commit to perform the Work as pro-

vided by this Order, it shall be deemed to have violated this Order and to have failed or refused to comply with this Order. Respondent's written notice shall describe, based on facts that exist on or prior to the effective date of this Order, any "sufficient cause" defenses asserted by Respondent under sections 106(b) and 107(c)(3) of CERCLA, 42 U.S.C. §§ 9606(b) and 9607(c)(3). The absence of a response by EPA to the notice required by this Paragraph shall not be deemed to be acceptance of Respondent's assertions.

VIII. PARTIES BOUND

19. This Order shall apply to and be binding upon Respondent and its directors, officers, employees, agents, successors, and assigns. No change in the ownership, corporate status, or other control of Respondent, nor any transfer of assets or real or personal property by the Respondent, shall alter any of the Respondent's responsibilities under this Order.

20. During the period in which this Order is in effect, Respondent shall provide a copy of this Order to any prospective owners or successors before a controlling interest in Respondent's assets, property rights, or stock is transferred to the prospective owner or successor. Respondent shall provide a copy of this Order to each contractor and laboratory retained to perform any Work under this Order, within 5 days after the effective date of this Order or on the date such services are retained, whichever date occurs later. Respondent shall also provide a copy of this Order to each person representing Respondent with respect to the Work and shall condition all contracts and subcontracts entered into hereunder upon performance of the Work in conformity with this Order. Each contractor retained to perform. Work shall be deemed to be related by contract to Respondent within the meaning

of section 107(b)(3) of CERCLA, 42 U.S.C. § 9607(b)(3). Notwithstanding the terms of any contract, Respondent is responsible for compliance with this Order and for ensuring that its contractors comply with this Order, and perform any Work in accordance with this Order.

21. Within 7 days after the effective date of this Order Respondent shall record a copy or copies of this Order in the appropriate governmental office where land ownership and transfer records are filed or recorded, and shall ensure, if possible, that the recording of this Order is indexed to the titles of each and every property at the Site so as to provide notice to third parties of the issuance and terms of this Order with respect to those properties. Respondent shall, within 14 days after the effective date of this Order, send notice of such recording and indexing to EPA.

22. Not later than 30 days prior to any transfer of any real property interest in any property included within the Site, Respondent shall submit a true and correct copy of the transfer document(s) to EPA, and shall identify the transferee by name and principal business address and effective date of the transfer.

IX. WORK TO BE PERFORMED

23. Respondent shall prepare, implement, perform, and complete all actions required by this Order, including all actions required under approved plans, in accordance with the standards, criteria, specifications, requirements, and schedule set forth herein and in the Residential Soils RAWP/FDR, Exhibit 2. All Work under this Order is subject to oversight by and the prior approval of EPA. Undertaking any on-Site physical activity without prior approval of EPA is a violation of this Order.

24. All Work shall be conducted and completed in accordance with CERCLA, the NCP, 'pertinent' EPA guidance, and any amendments thereto which become effective prior to the date of completion of Work under this Order. Respondent shall be responsible for identifying and using other guidelines, policies, procedures, and information that may be appropriate for performing Work.

25. All Work shall be consistent with the ROD and the Performance Standards set forth in the ROD and the Residential Soils RAWP/FDR, Exhibit 2, including all applicable or relevant and appropriate requirements. Notwithstanding any action by EPA, Respondent remains fully responsible for achievement of the Performance Standards. Nothing in this Order, nor in EPA's approval of any document prepared by EPA under this Order, shall be deemed to constitute a warranty or representation of any kind by EPA that full performance of the RA action will achieve Performance Standards. Respondent's compliance with such approved documents does not foreclose EPA from seeking additional Work to achieve Performance Standards.

26. Respondent shall employ sound scientific, engineering, and construction practices in performing Work under this Order. All tasks shall be under the direction and supervision of qualified personnel with experience in the types of tasks required for implementation of the Work.

27. All Work shall be under the direction and supervision of a qualified project manager. Within 10 days after the effective date of this Order, Respondent shall notify EPA in writing of the name, address, telephone number, and qualifications of the project manager and the identity and qualifications of the primary support entities, staff, and contractors proposed to be used in

carrying out Work under this Order. If at any time Respondent proposes to use a different project manager, support entities, staff, or contractors, Respondent shall notify EPA and provide similar information at least 14 days before such persons perform any Work under this Order.

28. EPA will review Respondent's selection of and changes in project manager, support entities, staff, or contractors according to the terms of this Section and Section XIV of this Order. If EPA disapproves of the selection of a project manager, support entities, staff, or contractors, Respondent shall submit to EPA within 14 days after receipt of EPA's disapproval, a list of project managers, support entities, staff; or contractors that would be acceptable to Respondent. EPA will thereafter provide written notice to Respondent of the names that are acceptable to EPA. Respondent may then select any approved name or names from that list and shall notify EPA of its selection(s) within 14 days of receipt of EPA's written notice.

29. Respondent shall, no later than 10 days prior to any off-Site shipment of hazardous substances from the Site to an out-of-State waste management facility, provide written notification of such shipment of hazardous substances to the appropriate state environmental official in the receiving state, to EPA, and to MDEQ. However, the notification of shipments shall not apply to any off-Site shipments when the total volume of all shipments from the Site to the state will not exceed 10 cubic yards.

a. The notification shall be in writing, and shall include the following information: (1) the name. and location of the facility to which hazardous substances are to be shipped; (2) the type and quantity of hazardous substances to be shipped; (3) the expected

schedule for the shipment of the hazardous substances; and (4) the method and route of transportation. Respondent shall notify EPA, MDEQ, and the receiving state of major changes in the shipment plan, such as a decision to ship the hazardous substances to another facility within the same state or to a facility in another state.

b. The identity of the receiving facility will be determined by Respondent at the earliest possible time. Respondent shall provide all relevant information, including the information noted above, as soon as practicable after a decision is reached, but in no event later than the time specified in this Paragraph.

30. Respondent shall cooperate with EPA in providing information regarding the Work to the public. If requested by EPA, Respondent shall participate in the preparation of such information for distribution. to the public and in public meetings which may be held or sponsored by EPA to explain activities at or relating to the Site.

X. FAILURE TO ATTAIN PERFORMANCE STANDARDS

31. In the event that EPA determines that response activities in addition to those set forth in the Residential Soils RAWP/FDR, Exhibit 2, are necessary to attain Performance Standards or accomplish the selected remedy for the Residential Soils RDU, EPA may notify Respondent that additional response actions are necessary.

32. Unless otherwise stated by EPA, within 30 days of receipt of notice from EPA that additional response activities are necessary to meet Performance Standards, Respondent shall submit for approval by EPA a

work plan for the additional response activities. The plan shall conform to the applicable requirements of Sections IX, XVI, and XVII of this Order. Upon EPA's approval of the plan pursuant to Section XIV, Respondent shall implement the plan for additional response activities. in accordance with the provisions and schedule contained therein.

XI. EPA PERIODIC REVIEW

33. Under section 121(c) of CERCLA, 42 U.S.C. § 9621(c), and any applicable regulations, EPA may review the RA to assure that the Work performed pursuant to this Order adequately protects human health and the environment. Respondent shall conduct the studies, investigations, or other response actions determined necessary by EPA for EPA to conduct its review. As a result of any review performed under this Paragraph, Respondent May be required to perform additional Work or to modify Work previously performed.

XII. ADDITIONAL RESPONSE ACTIONS

34. EPA may determine that work, in addition to that identified in this Order, may be necessary to protect human health and the environment. If EPA determines that additional response activities are necessary, EPA may require Respondent to submit a work plan for additional response activities. EPA may also require Respondent to modify any plan, design, of other deliverable required by this Order, including any approved deliverable.

35. Not later than 30 days after receiving EPA's notice that additional response activities are required pursuant to this Section, Respondent shall submit a work plan for the response activities to EPA for review and approval. Upon approval by EPA, the work plan is incorporated into this Order as a requirement of this

Order and shall be an enforceable part of this Order. Upon approval of the work plan by EPA, Respondent shall implement the work plan according to the standards, specifications, and schedule in this Order and the approved work plan.

Respondent shall notify EPA of its intent to perform such additional response activities within 7 days after receipt of EPA's request for additional response activities.

XIII. ENDANGERMENT AND EMERGENCY RESPONSE

36. In the event of any action or occurrence during the performance of the Work which causes or threatens to cause: a release of a hazardous substance or which may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action to prevent, abate, or minimize the threat and shall immediately notify EPA and MDEQ. If neither the EPA Remedial Project Manager nor the Alternate Project Manager are available, Respondent shall notify the EPA Emergency Response Branch, EPA Region VIII. Respondent shall take such action in consultation with the EPA Remedial Project Manager and in accordance with all applicable provisions of law and of this Order. In the event that Respondent fails to take appropriate response action as required by this Section, and EPA takes action instead, Respondent shall reimburse the United States for all costs of the response action not inconsistent with the NCP. Respondent shall pay the response costs in the manner described in Section XXII of this Order.

37. Nothing in the preceding Paragraph shall be deemed to limit any authority of the United States to take, direct, or order any action to protect human

health and the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances on, at, or from the Site.

XIV. EPA REVIEW OF DELIVERABLES

38. After review of any deliverable which must be submitted for review and approval pursuant to this Order, EPA may: (a) approve the submission, (b) approve the submission with its own modifications, (c) disapprove the submission and direct Respondent to re-submit the document after incorporating EPA's comments, or (d) disapprove the submission and assume responsibility for performing all or any part of the response action. As used in this Order, the terms "approval by EPA," "EPA approval," or similar term means the action described in phrases (a) or (b) of this Paragraph.

39. In the event of approval or approval with modifications by EPA, Respondent shall proceed to take any action required by the deliverable, as approved or modified by EPA.

40. Upon receipt of a notice of disapproval or a request for a modification, Respondent shall, within 7 days or such time as specified by EPA in its notice of disapproval or request for modification, correct the deficiencies and resubmit the deliverable for approval. Notwithstanding the notice of disapproval, or approval with modification, Respondent shall proceed, at the direction of EPA, to take any action required by any non-deficient portion of the deliverable.

41. Any failure of Respondent to obtain full approval of a deliverable when required is a violation of this Order.

XV. REPORTING REQUIREMENTS

42. Respondent shall submit to EPA and MDEQ monthly progress reports containing, at a minimum, the following information:

a. A description of actions taken to comply with this Order, including plans and actions completed, during the previous month;

b. A description of problems encountered and any anticipated problems, any actual or anticipated. delays, and solutions developed and implemented to mitigate any problems or delays;

c. Any change orders, nonconformance reports, claims made, and actions taken to rectify problems;

d. Work planned for the next month with schedules relating such Work to the overall project schedule for RA completion, and

e. Except for information previously submitted, copies of inspection logs and results of all sampling, tests, and other data (including validated analytical data with supporting documentation on Contract Laboratory Program Form I's or in a similar format) received or produced by Respondent during the course of Work during the previous month.

These reports shall be submitted on or before the 10th day of each month from the effective date of the Order and each month thereafter until EPA determines that reports are no longer required.

43. During construction, Respondent shall record information each day on construction activities discussing, at a minimum, the daily activities, field adjustments, change orders, summaries of problems and actions to rectify problems, and such information as is customary in the industry. Information recorded

on a given day shall be available to EPA for inspection the following day. The daily records shall be compiled and delivered to EPA and the State monthly with the progress reports required under the preceding Paragraph.

44. Respondent shall prepare and submit to EPA and MDEQ O&M reports that include, at a minimum, the following elements:

a. A description of O&M activities performed during the reporting period;

b. A description of the performance of each component of the remedial action requiring O&M, including a summary of any monitoring data demonstrating the performance of the remedy and its effectiveness in meeting Performance Standards;

c. A description and summary of the results of all monitoring performed in connection with the remedy;

d. A statistical evaluation of the monitoring data and a conclusion as to whether the results exceed appropriate criteria, and whether any exceedances necessitate the implementation of contingency measures;

e. Identification of any problems or potential problems and a description of all steps taken or to be, taken to rectify the problems;

f. An appendix containing all validated data and supporting documentation on Contract Laboratory Program Form I's or in a similar format collected during the reporting period and not previously submitted; and

g. Copies of any O&M training materials and a record of employee attendance at training sessions.

O&M reports shall be submitted annually on or before the 10th day of January, commencing January 2003, or upon approval of the O&M Plan as provided under Amendment 13 to Administrative Order on Consent Docket No. CERCLA-VM-88-16, whichever is later, and continuing until EPA notifies Respondent that the frequency of reporting may be reduced.

XVI. QUALITY ASSURANCE, SAMPLING, AND DATA ANALYSIS

45. Respondent shall ensure that Work performed, samples taken, and analyses conducted conform to the requirements of this Order and the EPA-approved sampling and analysis plan. Respondent will ensure that its field personnel are properly trained in the use of field equipment and chain-of-custody procedures.

46. To provide quality assurance and maintain quality control, Respondent shall use applicable portions of the approved quality. assurance, quality control, and chain of custody procedures for all samples in accordance with the Clark Fork River Superfund Site Investigations Quality Assurance Project Plan (CFRSSI QAPP) and any amendments made thereto during the course of the implementation of this Order. Respondent shall ensure that EPA and MDEQ personnel and their authorized representatives are allowed access at reasonable times to all laboratories utilized by Respondent in implementing this Order. In addition, Respondent shall ensure that such laboratories shall analyze all samples submitted by EPA and MDEQ pursuant to the QAPP for quality assurance monitoring. Respondent shall ensure that the laboratories it uses for the analysis of samples taken pursuant to the Order perform all analyses according to accepted EPA methods. Accepted EPA methods consist of those methods which are documented in the CFRSSI

Laboratory Analytical Protocol, and any amendments made thereto during the course of the implementation of this Order. Respondent shall ensure that all laboratories it uses for analysis of samples taken pursuant to this Order participate in an EPA or EPA-equivalent QA/QC program. Respondent shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this Order will be conducted in accordance with the procedures set forth in the QAPP.

47. Upon request, Respondent shall allow split or duplicate samples to be taken by EPA and MDEQ or their authorized representatives. Respondent shall give EPA and MDEQ reasonable notice of any sample collection activity. In addition, EPA and MDEQ shall have the right to take any additional samples that EPA or MDEQ deem necessary. Upon request, EPA and MDEQ shall allow Respondent to take split or duplicate samples of any samples they take as part of EPA's oversight of Respondent's implementation of the RA:

48. Respondent shall submit to EPA and MDEQ copies of the results of all sampling and/or tests or other data obtained or generated by or on behalf of Respondent with respect to the RA and/or the implementation of this Order pursuant to the schedule set forth in the Residential Soils RAWP/FDR, Exhibit 2.

49. Notwithstanding any provision of this Order, EPA and MDEQ retain all of their information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, CECRA, and any other applicable federal and State statutes or regulations

XVII. COMPLIANCE WITH APPLICABLE LAWS

50. All Work shall be performed in accordance with the requirements of all federal and State laws and regulations. Except as provided in section 121(e) of CERCLA, 42 U.S.C. § 9621(e), and the NCP, no permit shall be required for any portion of the Work conducted entirely on-Site. Where any portion of the Work requires a federal or State permit or approval, Respondent shall submit timely and complete applications and take all other actions necessary to obtain and to comply with all such permits or approvals.

51. This Order is not, and shall not be construed to be, a permit issued pursuant to any federal or State statute or regulation.

52. All materials removed from the Site shall be disposed of or treated at a facility approved by EPA and in accordance with section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3); with off-site policy regulations at 40 C.F.R. 300.440; and with all other applicable federal, State, and local requirements.

XVIII. REMEDIAL PROJECT MANAGER

53. The EPA Remedial Project Manager is:

Charles Coleman, 8MO
EPA Region VIII, Montana Office
10 West 15th Street
Suite 3200
Helena, MT 59624
(406) 457-5038

The Alternate Remedial Project Manager is:

Robert Fox, 8MO
EPA Region VIII Montana Office
10 West 15th Street
Suite :3200
Helena, MT 59624
(406) 457-5033

EPA's lead attorney is:

Andrew J. Lensink
Sr. Enforcement Attorney
EPA Region VIII
999 18th Street, Suite 300
Denver, CO 80202
(303) 312-6908

MDEQ's Project Manager is:

William Botsford
Montana Department of Environmental Quality
Remediation Division
P.O. Box 200901
Helena, MT 59620
(406) 444-0477

EPA may change its Remedial Project Manager or Alternate Project Manager at any time and will inform Respondent of such changes.

54. The EPA Remedial Project Manager and Alternate Project Manager shall have the authority lawfully vested in a Remedial Project Manager and On-Scene Coordinator by the NCP. The EPA Remedial Project Manager and Alternate Project Manager shall have authority, consistent with the NCP, to halt any Work required by this Order, and to take any necessary response action.

55. All communications, whether written or oral, from Respondent to EPA shall be directed from Respondents' project manager to the EPA Remedial Project Manager or Alternate Project Manager. Respondent shall submit to EPA five copies and to MDEQ one copy of all documents, including plans, reports, and other correspondence, which are developed pursuant to this Order, and shall hand-deliver or send these documents by certified mail, return receipt requested, or overnight mail.

XIX. ACCESS AND DATA/DOCUMENT AVAILABILITY

56. Respondent shall allow EPA, MDEQ and their authorized representatives to enter and move freely about any and all property owned or controlled by Respondent at the Site and off-Site areas subject to or affected by the Work under this Order or where documents required to be prepared or maintained by this Order are located, for the purposes of inspecting conditions, activities, the results of activities, records, operating logs, and contracts related to the Site or Respondent and its representatives or contractors pursuant to this Order; reviewing the progress of Respondent in carrying cut the terms of this Order; conducting such tests as EPA, MDEQ, or their authorized representatives deem necessary; using a camera, sound recording device or other documentary type equipment; and verifying the data submitted to EPA and MDEQ by Respondent. Respondent shall allow EPA, MDEQ and their authorized representatives to enter the Site, to inspect and copy all records, files, photographs, documents, sampling and monitoring data, and other writings related to Work undertaken in carrying out this Order. Nothing herein shall be

interpreted as limiting or affecting EPA's right of entry or inspection authority under federal law.

57. If the Site, any off-Site area that is to be used for access, property where documents required to be prepared or maintained by this Order are located, or other property subject to or affected by the RA, is owned in whole or in part by parties other than those bound by this Order, Respondent will obtain, or use its best efforts to obtain, Site access agreements from the present owner(s) within 30 days of the effective date of this Order.

a. Respondent's best efforts shall include providing reasonable compensation to any off-Site property owner.

b. Access agreements shall provide access for EPA, MDEQ and their authorized representatives and Respondent and its contractors and shall specify that Respondent is not EPA's or MDEQ's representative with respect to the Site or Site activities.

c. Copies of such agreements shall be provided to EPA prior to Respondent's initiation of field activities. If access agreements are not obtained within the time referenced above, *Respondent* shall immediately notify EPA of its failure to obtain access,

58. Subject to the 'United States' non-reviewable discretion, EPA may use its legal authorities to obtain access for Repondent, may perform response actions with EPA contractors, or may terminate the Order if Respondent cannot obtain access agreements. Respondent shall reimburse EPA for all response costs (including attorney fees) incurred by the United States to obtain access for Respondent. If EPA performs tasks or activities with contractors and does not terminate the Order, Respondent shall perform all other activities

not requiring access to that property, and shall reimburse EPA for all costs incurred in performing such activities. Respondent shall integrate the results of any such tasks undertaken by EPA into the Work it performs under this Order.

59. Respondent shall provide to EPA and MDEQ upon request, copies of all documents and information within its possession and/or control or that of its 'contractors relating to activities at the Site or to the implementation of this Order, including but not limited to, sampling, analysis, chain-of-custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondent shall also make available to EPA and MDEQ for purposes of investigation, information gathering, or testimony, its employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

60. Respondent may assert a claim of business confidentiality covering part or all of the information submitted to EPA pursuant to the terms of this Order under 40 C.F.R. § 2.203, provided such claim is not inconsistent with section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), or other provisions of law. This claim shall be asserted in the manner described by 40 C.F.R. § 2.203(b) and substantiated by Respondent at the time the claim is made. Information determined to *be* confidential by EPA will be given the protection specified in 40 C.F.R. Part 2. If no such claim accompanies the information when it is submitted to EPA, it may be made available to the public by EPA without further notice to Respondent.

XX. RECORD PRESERVATION

61. For a period of 10 years after Work is completed under this order, Respondent shall preserve and retain all records and documents in its possession or control and in the possession or control of its contractors, on and after the date of signature of this Order, that relate in any manner to the Site, Respondent's potential liability under CERCLA, or performance of Work under this Order. At the conclusion of this document-retention period, Respondent shall notify the United States at least 90 days prior to the destruction of any such records or documents, and upon request by the United States, Respondent shall deliver any such records or documents to EPA at no cost to EPA.

XXI. ASSURANCE OF ABILITY TO COMPLETE WORK

62. Respondent shall demonstrate its ability to complete the Work required by this Order and to pay all claims that arise from the performance of the Work by obtaining and presenting to EPA, within 30 days from the effective date of this Order, one of the following: (1) a performance bond; (2) a letter of credit; (3) a guarantee by a third party; or (4) internal financial information to allow EPA to determine that Respondent has sufficient assets available to perform the Work. Respondent shall demonstrate financial assurance in an amount no less than the estimate of the cost for the RA for the Residential Soils RDU. If Respondent seeks to demonstrate ability to complete the remedial action by means of internal financial information, or by guarantee of a third party, it shall re-submit such information annually, on the anniversary of the effective date of this Order. If EPA determines that such financial information is inadequate,

Respondent shall, within 30 days after receipt of EPA's notice of determination, obtain and present to EPA for approval one of the other three forms of financial assurance listed above.

63. At least 7 days prior to commencing any physical on-Site activity at the Site pursuant to this Order, Respondent shall submit to EPA a certification that Respondent or its contractors have adequate insurance coverage or have indemnification for liabilities for injuries or damages to persons or property which may result from the activities to be conducted by or on behalf of Respondent pursuant to this Order. Respondent shall ensure that such insurance or indemnification is maintained for the duration of the Work required by this Order.

XXII. UNITED STATES NOT LIABLE

64. The United States, by issuance of this Order, and the State assume no liability for any injuries or damages to persons or property resulting from acts or omissions by Respondent, or its directors, officers, employees, agents, representatives, successors, assigns, contractors, or consultants in carrying out any action or activity pursuant to this Order. EPA, MDEQ, the United States, and the State may not be deemed to be parties to any contract entered into by Respondent or its directors, officers, employees, agents, successors, assigns, contractors, or consultants in carrying out any action or activity pursuant to this Order.

65. Respondent shall save and hold harmless the United States, the State, and their officials, agents, employees, contractors, subcontractors, or representatives for or from any and all claims or causes of action or other costs incurred by the United States, including but not limited to, attorneys fees and other expenses

of litigation and settlement arising from or on account of acts or omissions of Respondent, its officers, directors, employees, agents, contractors, subcontractors, and any persons acting on its behalf or under its control, in carrying out activities pursuant to this Order, including any claims arising from any designation of Respondent as EPA's authorized representative(s) under section 104(e) of CERCLA, 42 U.S.C. § 9604(e).

XXIII. ENFORCEMENT AND RESERVATIONS

66. EPA reserves the right to bring an action against Respondent under section 107 of CERCLA, 42 U.S.C. § 9607, for recovery of any response costs incurred by the United States related to the Site and not reimbursed by Respondent. This reservation shall include but not be limited to past costs, direct costs, indirect costs, the costs of oversight, the costs of compiling the cost documentation to support the oversight cost demand, as well as accrued interest as provided in section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

67. Notwithstanding any other provision of this Order, at any time during the response action, EPA may perform its own studies, complete the response action (or any portion of the response action) as provided in CERCLA and the NCP, and seek reimbursement from Respondent for its costs, or seek any other appropriate relief.

68. Nothing in this Order shall preclude EPA or MDEQ from taking any additional enforcement actions, including modification of this Order or issuance of additional Orders, and/or additional remedial or removal actions as EPA may deem necessary, or from requiring Respondent in the future to perform additional activities pursuant to CERCLA or any other applicable law.

69. Notwithstanding any provision of this Order, the United States and the State hereby retain all of their information gathering, inspection, and enforcement authorities and rights under CERCLA, RCRA, and any other applicable statutes or regulations.

70. Respondent shall be subject to civil penalties under section 106(b) of CERCLA, 42 U.S.C. § 9606(b), of not more than $27,500 for each day in which Respondent willfully violates, or fails or refuses to comply with this Order without sufficient cause. In addition, failure to provide response action properly under this Order, or any portion hereof, without sufficient cause, may result in liability under section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3), for punitive damages in an amount at least equal to, and not more than three times the amount of any costs incurred by the Fund as a result of such failure to take proper action.

71. Nothing in this Order shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person for any liability it may have arising out of or relating in any way to the Site.

72. If a court issues an order that invalidates any provision of this Order or finds that Respondent has sufficient cause not to comply with one or more provisions of this Order, Respondent shall remain bound to comply with all provisions of this Order not invalidated by the court's order.

XXIV. EFFECTIVE DATE AND COMPUTATION OF TIME

73. This Order shall be effective 14 days after signing. All times for performance of ordered activities shall be calculated from this effective date.

XXVI. OPPORTUNITY TO-CONFER

74. Respondent may, within 7 days after the date this Order is signed, request a conference with EPA to discuss this Order. The conference shall be limited to discussion of issues involving the implementation of the response actions required by this Order and the extent to which Respondent intends to comply with this Order. This-conference is not an evidentiary hearing, and does not constitute a proceeding to challenge this Order. It does not give Respondent a right to seek review of this Order, or to seek resolution of potential liability, and no official stenographic record of the conference will be made. At any conference held pursuant to Respondent's request, Respondent may appear in person or by an attorney or other representative. Such conference shall not delay the performance of any Work.

75. Requests for a conference must be by telephone followed by written confirmation mailed that day to:

Andrew J. Lensink
EPA Region VIII
999 18th Street, Suite 300
Denver, CO 80202
(303) 312-6908

IT IS SO ORDERED

BY: /s/ Max H. Dodson
Max H. Dodson, Assistant Regional Administrator
Office of Ecosystems Protection and Remediation

DATE: 8/14/02

[Anaconda Regional Water, Waste, and Soils OU ROD Amendment (Sept. 2011)]

RECORD OF DECISION AMENDMENT

ANACONDA REGIONAL WATER, WASTE, AND SOILS OPERABLE UNIT

Anaconda Smelter National Priorities List Site
Anaconda – Deer Lodge County, Montana

September 2011

U.S. Environmental Protection Agency
and
Montana Department of Environmental Quality

Record of Decision Amendment

Anaconda Regional Water, Waste & Soils Operable Unit
Anaconda Smelter National Priorities List Site
Anaconda – Deer Lodge County, Montana

September 2011

U.S. Environmental Protection Agency
Region 8, Montana Operations Office
10 West 15th Street, Suite 3200

Helena, Montana 59626

In consultation with and concurrence from:

Montana Department of Environmental Quality
1100 North Last Chance Gulch
P.O. Box 200901
Helena, MT 59620-0901

Record of Decision Amendment

Anaconda Regional Water, Waste and
Soils Operable Unit

Anaconda Smelter NPL Site

U.S. Environmental Protection Agency

Montana Department of Environmental Quality

September 2011

Part 1: Declaration

Declaration

Site Name and Location

Anaconda Smelter NFL Site
Anaconda, Deer Lodge County, Montana
ARWW&S OU
CERCLIS ID #MTD 093291656

Statement of Basis and Purpose

This decision document presents an Amendment to the ROD for the ARWW&S OU of the Anaconda Smelter NPL Site in Anaconda - Deer Lodge County, Montana. EPA, with the concurrence of DEQ revised the Selected Remedy in accordance with CERCLA, 42 USC §9601 *et seq.*, as amended, and the NCP [40 CFR Part 300].

This decision is based on the Administrative Record for the ARWW&S OU of the Anaconda Smelter NPL Site. The Administrative Record (on microfilm) and copies of key documents are available for public review at the joint-Deer Lodge County/Arrowhead Foundation Superfund Document Repository at 118 East Seventh Street in Anaconda. The complete written Administrative Record is maintained at the EPA - Montana Office, 10 West 15th Street, Suite 3200, in Helena, Montana and can be viewed there.

The State of Montana concurs with the Selected Remedy, as indicated by its signature.

Assessment of the Site

There are many pathways at the ARWW&S OU site that create unacceptable risks to human health and the environment, as documented in the Administrative Record. The remedial actions selected in the 1998 ROD, as modified by this Amendment, are necessary to protect public health or welfare or the environment

from actual or threatened releases of hazardous substances into the environment at the ARWW&S OU site.

Description of the Selected Remedy

The basis for the revisions to the Selected Remedy identified in the 1998 ARWW&S OU ROD are twofold: (1) fundamental changes resulting from the Agencies' decision to waive the arsenic human health standard in certain ground and surface waters at the site, based on the arsenic human health standard of 10 µg/L, which has resulted in expanded and new TI Zones; and (2) additional design investigations and work completed which has led to better site characterization and subsequent changes to the 1998 Selected Remedy. The first basis results in fundamental changes to the 1998 ROD, while the second basis results in significant changes to the 1998 ROD.

Based on protectiveness of ARARs, this ROD Amendment changes the human health standards for arsenic and zinc in ground and surface water, and the aquatic standards for cadmium, copper, and lead in surface water. This amendment also waives the arsenic human health standard in certain ground and surface waters at the site. The waiver of the arsenic human health standard in certain areas of the site is the only fundamental change to the selected remedy related to changes of the contaminant-specific standards. The contaminant specific ARAR changes since the 1998 ARWW&S OU ROD was issued are summarized in Table 3-1, which identifies the revised remedial action goals/performance standards for surface water and ground water. Other than the changes noted in Table 3-1, there are no changes to the Remedial Action Goals set forth in the 1998 ROD. An updated ARARs analysis is provided in Appendix A.

Also, numerous investigations were conducted to collect data to complete RDs. Data collected have led to a better characterization of the extent of contamination for waste, soils, ground water, and surface water. The lowering of the arsenic standard has led to a re-definition of the volume and spatial distribution of contaminated ground and surface waters within the site. These performance standard changes, additional site characterization, and design analyses have led to a modification of the remedy with regard to addressing sources of contamination and to the expected measure of performance. The new data and design analyses, as well as the data and analyses which formed the basis for the 1998 ROD, together provide the basis for the ROD Amendment.

The remedial action objectives identified in the 1998 ROD remain unchanged under this ROD Amendment. The fundamental and significant changes to the ROD for each media are summarized as follows. Fundamental changes are to ground water and surface water components.

- Ground Water - In addition to the expansion of the bedrock aquifer TI zone boundaries, a waiver of the arsenic human health standard have been identified for alluvial aquifers in the North Opportunity and South Opportunity areas. Although this ROD Amendment requires more source control measures (e.g., removal of miscellaneous wastes and reclamation of contaminated soils) than the 1998 Selected Remedy, TI evaluations have concluded that the human health arsenic standard will not be achieved within a reasonable period of time within the areas. A domestic well monitoring and replacement plan has been developed to ensure that

domestic well users within or adjacent to these TI zones will have drinking water that, at a minimum, meets standards.

- Surface Water - The arsenic human health standard for surface water is waived to the chronic and acute aquatic life federal and state standards of 150 and 340 µg/L, respectively, within the surface water TI zone. These surface waters have been impacted by groundwater discharges from the bedrock TI zone.
- Waste Management Areas - Waste Management Area (WMA) boundaries have been revised to include adjacent waste left in place.
- Miscellaneous Wastes - Certain of the miscellaneous wastes are now being removed and consolidated, or incorporated into WMAs, or are addressed under long-term operations and maintenance plans as dedicated developments_
- Contaminated Soils - Areas of reclamation have been expanded to the north and east. Additionally, two high arsenic (soil arsenic concentrations between 1,000 - 2,500 mg/kg) areas have been designated where steep slopes prevent safe operation of conventional reclamation equipment (Smelter Hill) or where well vegetated areas with wetlands and unique wildlife habitat are present (Dutchman). These high arsenic areas will be managed to minimize human exposure to arsenic.

Statutory Determinations

The Selected Remedy, as revised in this ROD Amendment, is protective of human health and the environment, complies with federal and state require-

ments that are legally applicable or relevant and appropriate to the remedial action, is cost effective and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

Since hazardous substances above health-based risk levels will remain on site, periodic reviews will be conducted throughout the remedial action and upon its completion to ensure that the remedy continues to provide adequate protection of human health and the environment.

Authorizing Signatures

/s/ Carol L. Campbell
Carol L. Campbell
Assistant Regional Administrator
Ecosystems Protection and Remediation
U.S. Environmental Protection Agency, Region 8

9/29/11
Date

The State of Montana DEQ, as the Supporting Agency for the ARWW&S OU of the Anaconda Smelter NPL Site (MTD093291656), concurs with this *Record of Decision Amendment.*

/s/ Richard H. Opper
Richard H. Opper, Director
State of Montana
Department of Environmental Quality

9/16/11
Date

* * *

6.4 Summary of South Opportunity Ground Water/Surface Water TI Waiver (Fundamental Change)

This section presents the remedial alternatives analyzed for the South Opportunity Ground Water/ Surface Water Area of Concern, a detailed evaluation of those alternatives for the South Opportunity Ground Water/Surface Water Area of Concern with respect to nine evaluation criteria that EPA has developed to address the statutory requirements and preferences of CERCLA, and the revised selected remedy and remedial requirements for the TI zone.

6.4.1 South Opportunity Ground Water/Surface Water AOC

The South Opportunity Ground Water/ Surface Water Area of Concern consists of valley bottom land located within an area generally bounded by Mill Creek to the north, the Streamside Tailings OU to the east, the Silver Bow County line to the south, and uplands associated with the Mount Haggin Wildlife Management Area (also the bedrock TI Zone) to the west. Figure 6-1 shows the South Opportunity Ground Water/ Surface Water Area of Concern.

Ground water quality in the South Opportunity area was investigated during the remedial investigation conducted for the Anaconda Regional Water and of the Anaconda Smelter NPL site during 1991 to 1996. During this investigation, some isolated areas of ground water contamination were identified. These areas are associated with waste areas such as Streamside Tailings, Yellow Ditch, and Blue Lagoon.

In addition to these discrete areas, a large area contaminated with low concentrations of arsenic was also identified. Based on the information collected for

the remedial investigation, an area of contamination was identified and given the name South Opportunity Area of Concern.

The1998 ROD (EPA and DEQ 1998) presented a map showing the South Opportunity alluvial arsenic ground water plume. This delineation was based on sampling and analysis of ground water present in seeps, domestic wells, and temporary piezometers installed after the Anaconda Regional Water and Waste OU remedial investigation was concluded in 1997.

As a part of RD, further investigation of ground water in the South Opportunity Area of Concern was conducted in 2002. This investigation included installing shallow temporary wells and collection and analysis of two ground water samples from each well. Overall, arsenic was the only contaminant that is present in most of the South Opportunity Area of Concern that is widespread and not associated with a specific waste source such as the Yellow Ditch, Blue Lagoon, or Streamside Tailings. Two of the temporary wells along Silver Bow Creek contained ground water very different than other monitoring wells in this area. The South Opportunity alluvial aquifer shallow ground water arsenic plume shown in the 1998 ARWW&S OU ROD was based on data collected from different depths within the alluvial aquifer, from monitoring wells, piezometers, and domestic wells, which were sampled over several years during different remedial investigations. A grid of temporary piezometers was installed during RD to further define the South Opportunity plume in 2002 (Atlantic Richfield 2004a). The 2002 ground water data indicates that the Yellow Ditch remains a potential source of ground water contamination in the South Opportunity area. Additional soil sampling during RD conducted in RD Us 5 (Blue

Lagoon) and 9 (Silver Bow Creek Fluvial Tailings) identified waste materials and soils with high levels of COCs (arsenic concentrations often exceeding the recreational/open space/agricultural human health cleanup level of 1,000 mg/kg). These materials will be removed and disposed into a WMA.

Synoptic surface water sampling was conducted in the South Opportunity area in 1992-1993 and in 2001. DEQ collected several samples in Willow Creek in 2007 and the United States Geological Survey (USGS) conducted hourly sampling in 2008 at the lower gaging station. In 2007 EPA conducted detailed surface water sampling in the South Opportunity area, including Willow Creek, Willow Glen Gulch, ditches, and tile drains. Although there was not a synoptic sampling event in 2007-2008, these data can be used to evaluate the distribution of water and arsenic in the South Opportunity area.

The results of these studies indicate that arsenic is present in the ground water at the top of the aquifer over a large area of South Opportunity at concentrations up to 150 µg/L. This plume is limited to the upper few feet of the aquifer and has not been detected in any domestic wells which tend to penetrate past the top of the aquifer. This plume occupies two general areas: along Willow Creek and between Willow Glen Ranch and the Town of Opportunity. Based on historic mapping, this widespread plume coincides with areas that have been flood irrigated. One monitoring well, MW-232, has contained significantly higher arsenic than the ground water elsewhere in South Opportunity. This monitoring well is downgradient of Yellow Ditch and in an area that was irrigated before 1996. Possible sources of elevated arsenic in the MW-232 area include contaminated sediments in Yellow Ditch,

contaminated water flowing into Yellow Ditch, or a combination of the two.

The ground water investigation conducted in 2002 identified elevated arsenic in shallow ground water in one monitoring well in the Crackerville area. Well SOSPZ26 contained 46 to 79 µg/L arsenic in the area between Yellow Ditch and Silver Bow Creek just south of Crackerville. Three domestic wells east of Crackerville contained arsenic concentrations exceeding 10 µg/ L during the 2006 domestic well sampling event.

Several ground water investigations have been conducted at the Town of Opportunity. Domestic wells here have arsenic concentrations less than 10 µg/L, with the exception of a few that had faulty surface seals. It is believed that the aquifer here is uncontaminated because the ground water originates in upper Mill Creek, less flood irrigation here compared to the agricultural fields to the south, and some hydraulic diversion by the tile drains south of Highway 1.

The South Opportunity Characterization Report (EPA 2011e) concluded that the source of arsenic contamination in surface water and ground water was a combination of contaminated soil and seasonally saturated conditions. The evaluation indicated that it is technically impracticable from an engineering perspective to reduce arsenic concentrations below 10 µg/L in ground water within the South Opportunity Ground Water/Surface Water Area of Concern. Figure 5-1 identifies a revised ground water area of concern for the South Opportunity area.

6.4.2 Description of Remedial Alternatives

Based on the studies described above, the South Opportunity TI Evaluation Report (EPA 2011b) concluded that Willow Creek is a gaining stream and

ground water forms a major portion of the flow. lnflow of contaminated ground water represents 66 to 79 percent of the arsenic load in surface water resulting in exceedances of the human health ARAR. Arsenic concentrations range from 11 to 164 µg/L in the mainstem and from 28 to 307 µg/L in small tributaries. These streams are B class waters with drinking water as a potential beneficial use. No permitted surface water intakes to public water supplies exist on Willow Creek.

As also discussed in the South Opportunity TI Evaluation Report (EPA 2011b), the sections below analyze remedial alternatives to address arsenic concentrations above the human health standard are analyzed for surface water and ground water.

6.4.2.1 Surface Water

As presented in the 1998 ARWW&S OU ROD, the selected remedy for surface water is source controls through land reclamation, selective removal of tailings, engineered storm water runoff controls, and monitoring. The South Opportunity TI Analysis (EPA 2011b) considered multiple approaches to remediation of the surface water in the South Opportunity area. The remedy for surface water in the South Opportunity Area of Concern includes:

ICs. ICs that are currently being developed will also address potential human consumption of surface water exceeding the arsenic human health standard. Specific ICs components to address this potential risk include CPMP and the DPS. The CPMP includes educational materials such as brochures and periodic newspaper announcements to inform the public about arsenic present in certain surface water receptors, while the DPS will include provi-

sions that prohibit individuals to use surface water as a drinking water source within the Smelter Overlay District.

ARAR Waiver. Waiver of the arsenic human health standard for certain surface water within the South Opportunity Area of Concern. No other surface water standards are being considered for waivers as a result of this Tl analysis. No other waivers are applied as other ARARs will be or have been met.

Monitoring. Surface water will continue to be monitored to help ensure compliance with ARARs that have not been waived.

For comparison, two alternatives for surface water restoration are discussed.

Alternative 1: Collection of surface water at a single diversion in Lower Willow Creek. The water would be treated and returned to the surface water immediately below the diversions.

Alternative 2: Collection and treatment of ground water along gaining reaches of Willow Creek. This could he accomplished by collecting and routing ground water to a treatment plant, or by installation of a PRB along Willow Creek. This alternative is a ground water action with the purpose of preventing migration of arsenic to surface water receptors.

6.4.2.2 Ground Water

As presented in the 1998 ARW W&S OU ROD, the selected remedy for ground water where restoration of ground water to beneficial uses is not practicable is to: prevent further migration of the plume; prevent exposure to the contaminated ground water; and further reduce risk by minimizing transport of COCs to the

bedrock and alluvial aquifers. The remedy for ground water in the South Opportunity Area of Concern includes:

> ICs. A CGWA is being developed for the ARWW&S outside of the South Opportunity area. The CGWA does not currently anticipate an outright well ban, so the details of the ground water controls should be evaluated to see if this is appropriate for the South Opportunity Area of Concern.
>
> ARAR Waiver. Waiver of the arsenic human health standard for ground water within the South Opportunity Area of Concern. No other ground water standards are being considered for waivers as a result of this TI analysis. No other waivers are applied as other ARARs will be or have been met.
>
> Monitoring. Ground water will continue to be monitored to help ensure compliance with ARARs that have not been waived.

No ground water alternatives were identified that resulted in remediation of the ground water within the South Opportunity Area of Concern because of the widespread nature of the source. Source control alternatives beyond those already implemented were eliminated during screening. Therefore, all ground water strategies include waiver of the arsenic human health standard for ground water and implementation of ICs. Ground water remediation alternatives that prevent discharge of contaminated ground water to Willow Creek are the same as Surface Water Alternative 2 discussed above. Because the contaminated South Opportunity area ground water discharges to surface water, movement of the plume is hydraulically controlled. Therefore, this remedial strategy does not

include a separate ground water capture and treatment component to be evaluated.

6.4.3 Comparative Analysis of Alternatives

In accordance with the NCP, the relative performance of each alternative is evaluated using the nine criteria (40 C.F.R. § 300.430 (e)(9)(iii)) of the NCP as a basis for comparison. The purpose of the evaluation process is to determine which alternative: (a) meets the threshold criteria of overall protection of human health and the environment and attainment of ARARs, (b) provides the "best balance" with respect to the five balancing criteria of 40 CFR § 300.430(e)(9)(iii)(C)-(G), and (c) takes into consideration the acceptance of the state and the community.

6.4.3.1 Threshold Criteria

Overall protection of human health and the environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or ICs.

Protection of human health is ensured through a combination of ICs and monitoring. All alternatives would leave arsenic in the ground water upgradient of the collection point, so ICs would be needed to be protective of human health.

Willow Creek surface water meets aquatic life standards nearly all of the time. One exceedance of the 150 µg/L aquatic life standard for arsenic was measured by the USGS during 5 years of monitoring (164 µg/ L).

Based on this monitoring record, it is anticipated that aquatic life exceedances will be rare and minor in nature. Aquatic life standards do not apply to ground water.

Existing data compiled during the Baseline Ecological Risk Assessment (EPA 1997) and in fish surveys completed by FWP suggest that although occasional exceedances of Water Quality Bulletin(WQB)-7 (the predecessor to the current DEQ-7 standards) aquatic life standards present a potential risk, the ARWW&S OU streams generally support reasonable populations of aquatic organisms. By diverting surface water to a treatment facility, treating the water to reduce arsenic concentrations below 10 µg/L (well below the aquatic life standard of 150 µg/L), and returning the treated water to the point of collection, significant changes in physical and chemical properties of surface water can be expected. These include temperature, dissolved oxygen, and general chemistry (e.g., total dissolved solids would increase due to the addition of chemical reagents). The cumulative effects of these impacts on downstream aquatic life are not known and would require analysis before a treatment system could be implemented.

Surface water Alternative 1 would leave arsenic in the surface water above the point of diversion for treatment, so ICs would be needed to be protective of human health. Surface water Alternative 1 would not change concentrations in Willow Creek itself; it would only reduce the loading of arsenic from Willow Creek to downstream surface water receptors.

Surface water Alternative 2 (ground water treatment) would also not necessarily achieve the human health standard in Willow Creek. Arsenic concentrations in Upper Willow Creek exceed the human health

standard due to contaminated bedrock ground water from the bedrock T1 zone. Therefore, any captured and treated ground water would need to be treated to less than 10 µg/ L in sufficient quantities to dilute the upgradient surface water so that the mixture met the human health standard. ln the case of active treatment of captured ground water, surface water upstream of the treatment plant effluent would not meet the human health standard.

Similarly, treating Willow Creek to meet human health standards would not eliminate exceedances of arsenic in downstream receiving waters (Mill Creek and the Clark Fork River). Calculation of estimated downstream concentrations in the Clark Fork River if Willow Creek surface water were treated to 10 µg/L showed that the Dark Fork River would still not meet the human health standard.

Compliance with ARARs

Section 121(d) of CERCLA, 42 U.S.C. § 9621(d) and NCP 40 C.F.R. §300.430(f)(1)(ii)(B) require that RAs at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4), 42 U.S.C. 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, RA, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a state in

a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, RA, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides a basis for an invoking waiver.

The alternate remedial strategy meets all ARARs except the 10 µg/ L human health standard for arsenic in surface and ground water (as specified in DEQ-7 and 40 CFR § 141.11).

Surface water Alternative 1 would leave arsenic in Willow Creek surface water in excess of the human health standard. Furthermore, the reduction in loading would not result in achievement of human health standards in receiving waters.

Surface water Alternative 2 (collection and treatment of ground water prior to discharge to Willow Creek) would significantly reduce arsenic loading to Willow Creek and would locally reduce arsenic concentrations. However, the extent of this decrease is

uncertain. Subsequent arsenic loads transported to downstream receiving waters would also decrease, but treatment of arsenic in Willow Creek alone will not result in downstream receiving waters meeting the arsenic standard.

None of the alternatives is capable of achieving the human health standard for arsenic with certainty. Therefore, a waiver of the human health arsenic standard is necessary.

6.4.3.2 Primary Balancing Criteria

Long Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

The remedial strategy does not involve implementation of RAs. The strategy is limited to administrative actions and ICs. These are considered to be very effective and permanent for limiting exposure to arsenic in surface water and ground water.

The treatment alternatives rely on active collection and treatment of surface and/or ground water indefinitely. The long-term effectiveness and permanence of treatment alternatives requires a very large commitment to O&M.

As already discussed, treatment would not result in achieving the human health standard in the receiving waters (Mill-Willow Bypass and Clark Fork River).

Reduction in Toxicity, Mobility or Volume through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

The alternate remedial strategy does not alter the existing toxicity, mobility or volume of arsenic in surface or ground water in the South Opportunity Area of Concern. Source control through removal or dewatering was not compatible with existing land uses and was unimplementable. The treatment alternatives are effective at reducing the toxicity and mobility of arsenic via capture and treatment. The ground water interception and treatment alternative would contain the ground water plume and prevent migration to surface water, resulting in decreased arsenic concentrations in surface water. However, upstream sources of arsenic cause Willow Creek to exceed the arsenic standard upstream of the South Opportunity AOC, and treatment of contaminated ground water would not ameliorate this situation.

Implementability

The alternate remedial strategy of ICs is easily implemented. Waiver of the ARARs can be implemented by EPA through administrative actions. The waiver is completed here within this ROD Amendment.

The treatment alternatives require construction of collection systems and a very large treatment plant, or a very large permeable reactive barrier. While challenging because of the large scale, the treatment alternatives could be implemented.

Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, and the environment during construction and operation of the remedy until cleanup levels are achieved.

There is no construction phase to the alternate remedial strategy, so the short-term effectiveness is the same as the long-term effectiveness.

The treatment alternatives would not be effective until after the completion of full scale collection and treatment facilities. Therefore, the short-term effectiveness is the same as current conditions.

Cost

Costs for the remedial alternatives analyzed in the Tl Evaluation are provided in Appendix C. The cost of the alternate remedial strategy has not been quantified, since it adds no additional costs to the existing 1998 Selected Remedy requirements for monitoring and ICs. The costs of the treatment alternatives are high, mainly due to the large scale of the impacted area. The treatment plant or permeable reactive barrier capital and 50-year Operations &Maintenance (O&M) costs were estimated to be from approximately $59 million to $104 million dollars. Significant costs such as energy and sludge management were not included. The cost of the collection systems was not prepared because it is expected that the treatment plant represents the largest cost.

6.4.3.3 Modifying Criteria

State Acceptance

Montana DEQ concurs with this remedy modification, as indicated by their signature to concurrence with this ROD Amendment.

Community Acceptance

EPA and DEQ received several comments from the public during the public comment period for the proposed plan. Public comments, and the Agencies' responses to those comments, are summarized in Section 12 and are provided in the Responsiveness Summary.

6.4.4 Alternative Remedial Strategy

6.4.4.1 Ground Water

The South Opportunity Tl analysis (EPA 2011b) showed that the source of arsenic contamination in ground water was the combination of contaminated soil and saturated conditions. The previous RAs of reducing irrigation and allowing natural attenuation to work for eleven years has not resulted in significant progress toward meeting the ground water ARAB. Additional RAs which would control the source through removal action or changing the hydrologic conditions are difficult to implement because much of the area of concern is a jurisdictional wetland (i.e., a wetland regulated under Section 404 of the Clean Water Act). Additionally, the geochemical conditions necessary for natural attenuation are not present (EPA 2011b). Since no actions are available which will remove the source or disrupt the transport pathway, any ground water within or entering the South Opportunity Area of Concern will remain or become contaminated with arsenic. Even if ground water is withdrawn for treatment, the recharge water will become contaminated.

Because the contaminated South Opportunity Tl zone ground water discharges to surface water (Willow Creek), movement of the plume is hydraulically controlled.

The South Opportunity TI analysis concluded that it is technically impracticable from an engineering perspective to reduce arsenic concentrations below 10 µg/L in ground water within the South Opportunity TI. It would be possible to collect and treat ground water just prior to its entry into Willow Creek. Treating ground water at the downgradient edge of the plume would not change the extent, magnitude, or mobility of the ground water plume. This action would benefit the surface water receptors and thus is not a strict ground water RA. On this basis, ground water treatment at the edge of the plume is considered a surface water action.

6.4.4.2 Surface Water

The South Opportunity Tl analysis (EPA 2011b) showed that the source of arsenic in surface water is gains from ground water via small tributaries and drain tiles. An additional source of arsenic in surface water is upstream source within the bedrock Tl zone. As discussed in Section 6.1.4.1, it is technically impracticable to remediate the ground water to the arsenic human health standard throughout the South Opportunity Area of Concern, and a previous determination has concluded that it is technically impracticable to remediate the upstream source.

6.4.4.3 TI Zone Boundaries

Surface water investigations conducted in 1993 and 2007 attempted to sample all tributaries to lower Willow Creek. All samples exceeded 10 µg/ L arsenic confirming the widespread nature of surface water

contamination. Figure 6-1 delineates the South Opportunity ground water/surface water TI zone. The area generally includes the valley bottom land located within an area bounded by Mill Creek or Highway 1 to the north, the Streamside Tailings OU to the east, the Silver Bow County line to the south, and uplands associated with the Mount Haggin WMA (also the bedrock TI zone) to the west. Downgradient movement of the plume is hydraulically controlled by discharge into surface water either along Willow Creek or drain tiles. Because of the connection between the extent of wetlands and ground water contamination, wetlands on the north side of Highway 1 are included in the TI zone. Wetlands further north are not included in the TI zone because no data have been collected to indicate that shallow ground water contamination exists in that area. Data from drain tiles and domestic wells indicate very low arsenic concentrations in ground water north of the TI zone.

The surface water TI zone includes surface water within the ground water TI zone plus all surface water exiting the bedrock TI zone to the confluence of Mill Creek and Willow Creek. The South Opportunity TI evaluation focused on the mainstem named streams and named tributaries because the available data are mostly limited to these water bodies. The results of the analysis are extended to include all surface water within the boundaries of the TI zone because the loading sources are continuous and the potential exists for arsenic concentrations to exceed 10 µg/L in surface water throughout the TI Zone. The arsenic human health standard AFAR waiver applies to all surface water within the TI zone.

6.4.5 Remedial Requirements

EPA, in consultation with DEQ, has determined that large-scale soil removal from the South Opportunity Ground Water/Surface Water Tl Zone will not be further considered, due the inordinate cost of large scale removal and the uncertainty of the effectiveness of source removal, as well as other elements set forth in South Opportunity TI Evaluation Report (EPA 2011b). Because the soils will remain in place, shallow ground water interaction with these soils will continue to present a potential contaminant loading source to both ground water and surface water. EPA evaluated the potential for treating the ground water as part of the South Opportunity TT Evaluation Report. EPA has concluded that water treatment provides no appreciable benefit to the environment, due to the inefficacy of the collection systems, as well as the additional reasons set forth in the South Opportunity Tl Evaluation Report.

Pursuant to Section 121(d)(4)(c) of CERCLA, 42 U.S.C. § 9621(d)(1), the Agencies waive the ground water human health standard for arsenic of 10 µg/L for the shallow ground water within the South Opportunity Ground Water/Surface Water Area of Concern as depicted in Figure 6-1, based on the South Opportunity Tl Evaluation. Similar to the North Opportunity Ground Water/Surface Water Area of Concern, the ground water TI waiver applies to the uppermost portion of the shallow unconfined alluvial aquifer within the South Opportunity TI Ground Water/Surface Water Area of Concern, where shallow ground water interacts with high arsenic soils. Note that naturally-occurring arsenic in ground water is not addressed under CERCLA.

In addition to the remedial requirements identified in the 1998 ARWW&S OU ROD, the following RAs will be taken for the South Opportunity area of concern:

- Additional source control measures are required by removing waste associated with Yellow Ditch, and other fluvially-deposited tailings in South Opportunity;
- Prevent migration of plume toward the community of Opportunity;
- Performance monitoring of ground water and surface water to evaluate the effects of the source control measures;
- ICs CGWA to manage domestic use of ground water; and
- Testing of domestic well users though the domestic well monitoring and replacement plan, including providing an alternative water supply, if necessary.

* * *

9.3 Domestic Well Sampling and Replacement

To prevent human exposure to arsenic from drinking ground water within and adjacent to the Tl zones that exceeds human health standards, a domestic well sampling and replacement program will be established to periodically test all domestic wells within the domestic well area of concern, which is shown in Figure 9-2. Elements of this program will include a SAP; initial monitoring schedule; re-sampling in the event that initial samples exceed human health standards; and procedures and schedules to provide alternative water supplies if the exceedance is confirmed and is related to the site contamination.

Under Montana law, a GWA may be designated to limit certain types of water appropriations due to water quality problems (MCA 85-2-501 et. seq). CGWAs are administered by the Montana Department of Natural Resources (DNRC), and any new domestic wells drilled within the area require a permit from the DNRC. DEQ will petition for designation of the domestic well area of concern shown in Figure 9-2 as a CGWA. Under a domestic well sampling and replacement program, the Montana Bureau of Mines and Geology (MBMG) would coordinate the drilling of any new well with the property owner and the well driller to minimize the potential for constructing a well within ground water that could potentially exceed human health standards. After well completion, MBMG will sample the new well, and if an exceedance is detected and confirmed, another new well will be drilled or another alternative water supply will be provided.

In addition to regulating new wells, existing wells within the CGWA will be tested on a regular basis, and replaced if the exceedance is confirmed and related to the site contamination. Sampling schedule, frequency, procedures, and analyses will be provided in the domestic well sampling and replacement program. Domestic well sampling by the MBMG will be coordinated with the ADLC health department to allow sampling for non-Superfund related contamination.

[Expert Report of Richard E. Bartelt (Apr. 2013)]

MONTANA SECOND JUDICIAL DISTRICT COURT
SILVER BOW COUNTY

No. DV-08-173 BN

Christian, *et al.*

v.

BP Amoco Corporation, *et al.*

EXPERT REPORT
OF RICHARD E. BARTELT, P.E.

/s/ Richard E. Bartelt

April 2013

TABLE OF CONTENTS

I. INTRODUCTION AND SUMMARY OF OPINIONS

This report presents the opinions that I, Richard E. Bartelt, anticipate providing in this matter. I have been requested to provide expert opinions on behalf of Defendants. My opinions are as follows:

1. Technology and regulatory requirements associated with disposal of hazardous wastes have evolved dramatically since the late 1970's. The passage of CERCLA resulted in the development of investigation and remediation processes not envisioned before 1980.

2. Scientific research and technology have improved field and analytical techniques since the late 1970's. Accordingly, an understanding of the science and the regulatory requirements to investigate and remediate contaminated sites during the relevant time period is crucial to evaluating the adequacy of early investigations and response actions.

3. Operations at the Anaconda Smelter Superfund Site (the Site) took place before environmental regulations regarding management, investigation and remediation of hazardous materials were in place.

4. From the outset, response actions at the Site have been directed and approved by United States Environmental Protection Agency (USEPA) with ongoing input and oversight from the State of Montana Department of Environmental Quality (the State).

5. Atlantic Richfield has conducted response actions at the Site to the satisfaction of USEPA and the State.

6. The response actions implemented at the Site have been consistent with the National Contingency Plan (NCP) and are protective of human health and the environment.

7. The responses taken at the Site have been iterative in nature as prescribed by the NCP and the 1988 RI/FS guidance.

8. Community involvement has been ongoing and consistent with the NCP since the initial responses at the Site began.

9. Since the remedies at the Site include the containment of hazardous substances, the remedies are subject to the formal Five-Year Review process to confirm the adequacy of protection of human health and the environment. The Five-Year review process ensures and documents the commitment to implementation of the selected remedy and updates selected remedies as appropriate.

II. QUALIFICATIONS

In February 1970, I received a Bachelor of Science Degree in Civil Engineering from Iowa State University. After graduation I was commissioned in the United States Army and was assigned as a construction officer in the Chicago District of the U.S. Army Corps of Engineers. During that military service I worked as a contract manager for site development activities at the then Newport Army Ammunition Plant near Newport, Indiana and was awarded the Army Commendation Medal for those activities. I was honorably discharged from the army as a First Lieutenant in 1972. I entered graduate school at Iowa State University under a drinking water and wastewater treatment fellowship program funded by the USEPA and in 1973 received a Master of Engineering Degree in Sanitary Engineering. Upon graduation I accepted a position with USEPA Region 5 in Chicago and worked in that Region from November 1973 to May 1987.

My initial assignment with USEPA was as an environmental engineer in the Region 5 Water Division where I worked in the construction grants program which funded the planning, design and construction of municipal wastewater treatment facilities. In 1974, I helped develop and implement a program to evaluate the relationship between groundwater and sewer systems. In 1976, I was selected to serve as the Section Chief of the Groundwater Protection Section in the Water Supply Branch of the Region 5 Water Division. While managing that section, I was appointed to the national work group responsible for design and implementation of a study known as the "Surface Impoundment Assessment." The Surface Impoundment Assessment was a nationwide study of surface impoundments intended to inventory surface impoundments and to identify those impoundments that might pose a threat to groundwater. The assessment was also intended to evaluate the need for USEPA regulation of such impoundments. In 1978, while Chief of the Groundwater Protection Section, I began working on a regional program for identification of "Uncontrolled Hazardous Waste Sites" located in Region 5. Many of these sites would later be addressed under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA or Superfund). I was appointed Chief of the USEPA Region 5 Environmental Emergency Investigation Branch (EEIB) in 1980.

This assignment included management responsibility for the Region 5 Emergency Response Program. Management of the Emergency Response Program included review and approval of requests for funding for removal actions, monitoring of progress of removal actions, and administrative oversight of completion reports and documentation. As Chief of the EEIB, I

also directed evaluations of numerous "hazardous waste sites" and was assigned as the Region 5 representative on the working group which USEPA convened to prepare for implementation of the pending Superfund legislation.

Following the enactment of CERCLA, I became the Region 5 Superfund Coordinator and Director of the Region 5 Office of Superfund. The Office of Superfund evolved over time into the Emergency and Remedial Response Branch (ERRB) and I served as chief of that branch or its predecessors from 1981 to 1987. While serving as Chief of the Region 5 ERRB, I was in charge of both removal and remedial actions for the Region. As Chief of the ERRB, I directed the development and implementation of the regional pre-remedial program which resulted in entering over 5,000 sites into the CERCLA Information System (CERCLIS). At the peak of the pre-remedial program, Region 5 was responsible for completing as many as 800 preliminary assessments (PAs) and 350 site inspections (SIs) a year. Working with USEPA headquarters personnel, I was the lead regional technical representative on the Record of Decision (ROD) work group. This group was responsible for developing the initial approach for preparing ROD's and for providing ROD training to regional Superfund program staff throughout the country. When I left USEPA Region 5 in May 1987, the Region 5 Superfund Program was the largest in the nation with several thousand sites in the CERCLIS database, more than 3,000 completed PAs, 1,200 completed SIs, over 200 sites on the National Priorities List (NPL), and over 150 completed CERCLA removal actions.

In addition to these responsibilities, while I managed the Region 5 Superfund program I was involved

with the development and revision of the CERCLA National Oil and Hazardous Substances Pollution Contingency Plan (NCP). In 1980 CERCLA required that the then existing NCP be revised to reflect the requirements of CERCLA. The NCP was originally published in September 1968 and had subsequently been updated on various occasions to address the requirements of the Clean Water Act. The CERCLA revisions were required to incorporate a process for remediating "hazardous waste sites" under the new statute. I participated in work groups drafting the revised process and many of those recommendations were later incorporated into the 1982 CERCLA revisions of the NCP. I was also a contributor to the November 1985 revisions to the NCP and was the principal Region 5 reviewer of proposed rule revisions during the regional signoff process.

After leaving USEPA, I spent one year with Dynamac Corporation working as a senior environmental engineer. In May of 1988, I joined Geraghty & Miller, Inc., as Vice President in charge of Engineering Services for the Midwest Region. I am currently a Senior Vice President serving as a National Expert for CERCLA Services for ARCADIS U.S., Inc., and am located in the ARCADIS office in Chicago, Illinois. In this capacity I am responsible for providing technical and regulatory support to ARCADIS project staff and clients in the areas of Federal, State and private party hazardous materials response under CERCLA and related statutes. I have managed and supported CERCLA projects throughout the country in all phases of response. Since leaving USEPA, I have been involved in providing technical and programmatic consulting services for over 100 National Priorities List (NPL) sites throughout the country and over 100 other sites where NCP compliance was a primary consideration in formulation

and implementation of response plans and activities. Most recently I have been the lead in helping the United States Coast Guard develop an NCP compliant program for investigating and remediating Coast Guard owned properties prior to divestiture for return to non-federal ownership.

I have provided expert testimony relative to site investigation and remediation as well as compliance with NCP, including trial testimony on several occasions. A copy of my resume is attached for reference (Attachment 1).

III. CERCLA BACKGROUND

As background to my opinions a general overview of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), referred to as Superfund, is necessary.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over the initial five years of CERCLA, $1.6 billion was collected from taxes that went to a trust fund established for cleaning up hazardous waste sites. Among other things CERCLA:

- established prohibitions and requirements concerning hazardous waste sites;

- provided for liability of persons responsible for releases of hazardous waste at these sites; and
- established a trust fund to provide for cleanup of sites when no responsible party could be identified.

The law authorizes two kinds of response actions:

- Short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response.
- Long-term remedial response actions, that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions when conducted by the government are only conducted at sites listed on EPA's NPL. Private parties may pursue remedial actions at non-NPL sites and the government may seek to have remedial actions taken at non-NPL sites.

CERCLA assigned the responsibility of remedy selection exclusively to the President and thus to USEPA (CERCLA § 104, §113 (k)(2)(B) and §121(9)) and required that states be responsible to assure all future maintenance of the selected remedy for the expected life of the actions. (CERCLA §104 (c) (3)) CERCLA also required the revision of the National Contingency Plan. The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) on October 17, 1986. SARA provided for a more defined process for evaluating site risks and screening and selecting remedies for responses (SARA

Section 105(a). Sections 113 (k) and 117 of SARA also provided for enhanced public information and public participation and the requirement for five-year reviews for site where hazardous substances would remain on site. (Section 121(c)) Section 122 (e)(6) of SARA specified that when an administrative order or consent decree was in place a potentially responsible party may not initiate any remedial action unless such action has been authorized by the President.

CERCLA provides for the conduct of response actions and recovery of costs incurred for removal or remedial actions which are consistent with the NCP where response is to address a release or threatened release of a hazardous substance. The very first National Multi-Agency Oil and Hazardous Materials Pollution Contingency Plan was published in September 1968. The first NCP to address the specifics of hazardous substance response was finalized in July 1982 with 22 pages of preamble and 19 pages of rule. This NCP included reference to the recently promulgated CERCLA statute and was intended to guide response actions taken under the plan. The current operative version of the NCP, which is dated March 8, 1990, establishes procedures and standards for responding to releases of oil, hazardous substances, pollutants, and contaminants. The 1990 NCP is accompanied by 142 pages of preamble that also rely on 80 pages of preamble from the 1988 draft NCP proposed rules. The 1990 NCP includes 52 pages of response guidance. The 1990 NCP was supplemented in September 15, 1994 to include Oil Pollution Act changes. The state of the art and science on which the CERCLA program is based has developed and evolved substantially since 1982 as indicated by the increase in size of the NCP and attendant preambles The NCP is found at 40 CFR Part 300 and includes methods for discovering and

investigating incidents and/or facilities at which hazardous substances have been disposed or otherwise come to be located as well as methods for evaluating and remedying releases or threats of releases from facilities which pose substantial danger to public health or the environment. The NCP is intended to provide a framework within which USEPA project managers have the flexibility to use their best judgment, consonant with the applicable law, regulation and guidance. (55FR8674)

CERCLA required the development and maintenance of a list of facilities that constituted the sites warranting the highest priority for remedial action. This list is known as the National Priorities List (NPL). The NPL is routinely updated on an as needed basis. Qualifying sites may be listed on the NPL or in appropriate circumstances deferred from listing. Prior to response the USEPA has the option to enter into negotiations with potentially responsible parties (PRPs) to permit PRPs to conduct response actions of any kind. (55Fed. Reg. 8694, March 8, 1990) The USEPA may defer to states to permit state oversight of response actions. The first proposed NPL, published in December 1982, was required to contain at least 400 sites. Prior to that listing two preliminary lists had been developed, the Interim Priorities List (containing 115 sites) and the Extended Eligibility List (containing 45 sites). CERCLA was intended to address hazardous waste sites not otherwise regulated under the Resource Conservation and Recovery Act (RCRA), passed in 1976, or other statutes that would provide for investigation and remediation of hazardous substances pollutants or contaminants. The passage of RCRA and CERCLA in the late 1970s and early 1980s established the national framework for managing the generation, storage, treatment and disposal of hazardous materials

and where necessary investigating and remediating sites and actual or threatened releases to the environment.

The NCP identifies the various steps that may be involved in the removal and remedial processes and allows a general comparison of how response actions are to proceed under each process. Removal actions are associated with the need for prompt action to respond to significant risk of harm to human life or health or to the environment (1988 NCP Preamble 53FR51404). Where a planning period of less than six months is available before on-site activities must begin, a time-critical removal may be taken. Where a time period of more than six months is available, a removal action may be taken but is to be preceded by the preparation of an engineering evaluation/cost analysis (EE/CA) and appropriate public participation (1988 53FR51409).

Remedial actions may be taken to address less urgent risks or threats and are typically preceded by substantial site characterization, risk assessment, the evaluation of alternatives and selection of a remedy. The approach to investigating situations not requiring urgent response are included in the NCP sections relating to EE/CA's and remedial investigation/ feasibility studies (RI/FS). Remedial actions are those actions consistent with permanent remedy taken instead of, or in addition to, removal actions. (40 CFR 300.5)

Remedial actions can be taken at a site whether the site is listed on the NPL or not. Due to resource limitations the federal government usually pursues remedial actions only for NPL sites unless a potentially responsible party is willing to conduct the remedial actions without listing. Remedial actions are

taken where time is available for evaluation and where releases or threatened releases are larger and more complex. Remedial actions are preceded by a remedial investigation (RI) which is intended to identify the nature and extent of contamination and the baseline risks posed by unremediated site conditions (1988 RI/FS Guidance). Once the site is characterized, alternatives are evaluated to identify protective and cost-effective response actions for addressing the identified site conditions. The process of identifying and screening alternatives results in the development of a feasibility study (FS). In screening down to the most promising alternatives, three criteria are initially used – effectiveness, implementability and cost. (1990 NCP Preamble, 55FR8712).

Individual alternatives surviving the initial screening undergo assessment against each of nine screening criteria which are categorized into three groups. The threshold criteria are: 1) overall protection of human health and the environment and 2) compliance with ARARs. The primary balancing criteria are: 3) long term effectiveness and permanence, 4) reduction of toxicity, mobility and volume, 5) short-term effectiveness, 6) implementability, and 7) cost. The last criteria are the modifying criteria: 8) state acceptance and 9) community acceptance. Final screening is based on evaluating each alternative against nine criteria which are identified in Section 300.430 of the NCP. Based on the detailed analysis of viable alternatives based on the nine evaluation criteria one alternative is identified as preferred by USEPA. This alternative, which may be a combination of a wide variety of response actions throughout a site or operable unit, is then published as a proposed plan and made available for public comment. USEPA selects the alternative that is the basis for the proposed plan. Where a PRP

conducts the RI/FS a preferred or recommended alternative is not typically identified in the FS. Rather the analysis of final alternatives is presented and EPA prepares the proposed plan that identifies the preferred alternative. The length of time required for the completion of an RI/FS and development of a proposed plan will depend on the size and complexity of the site and potential response actions.

The proposed plan is made available for public comment along with the administrative record that provides the basis for selection of the final remedy. Provision is made for a public meeting to discuss the remedy and to receive oral comments on the remedy. In some cases more than one public meeting may be held. Written comments are encouraged with the minimum comment period being not less than 30 days. Requests for extension of the comment period are typically honored. After reviewing the comments received, USEPA selects the final remedy and provides a summary of that remedy along with responses to all substantive comments and an explanation of how the selected remedy complies with the requirements of the NCP. The document that identifies the selected remedy and documents compliance with the NCP is known as the Record of Decision (ROD). If the remedy differs significantly from the proposed plan an explanation of those differences is provided in the ROD. Similarly, if over time conditions at a site change or new information regarding site conditions is developed necessitating modifications to the selected remedy, the NCP provides for changing the ROD by issuing an amendment or an explanation of significant differences (ESD). A ROD amendment requires the full complement of public participation opportunities including a public meeting and responses to comments received. The issuance of an ESD requires public

notice and an explanation of the significance of the differences.

The 1988 NCP Preamble addresses the relationship between removal and remedial activities. (53FR 51405) This preamble notes that opting to pursue the remedial process does not prevent the identification of urgent actions and initiation of a removal action at any time during the remedial process. The goal is identified as addressing the most significant threats in the most efficient and effective manner.

Section 113(k) (1) of CERCLA requires the establishment of an administrative record that contains the documents that form the basis for selection of a response action under CERCLA as discussed above. According to the preamble to the 1988 proposed NCP, this administrative record is intended to include "information available to the decision maker at the time the response was selected." (53FR51463) Judicial review of the selection of a response action is possible and is to be limited to the administrative record and focused on the information that was available to the decision maker.

IV. SITE HISTORY AND BACKGROUND

Smelting of ores from Butte commenced in the Anaconda area in 1884 at the Old Works just south of Stucky Ridge. Smelting was conducted there from 1884 until 1902. In 1902 the Old Works was taken out of service and smelting activities were moved to the Washoe Reduction Works, later called the Anaconda Reduction Works or just the Anaconda Smelter, and continued from 1902 until 1980. "In 1982 EPA and Anaconda (Atlantic Richfield Company) entered into a voluntary agreement to collect data regarding actual or threatened releases of heavy metals, including

arsenic, lead, cadmium, zinc, beryllium, and copper, in and around the Anaconda Smelter Site into the environment." (October 1984 Administrative Order on Consent, Docket No. CERCLA-VIII-84-08). The Anaconda Smelter Site was identified as a potential candidate for CERCLA activity in 1980 and was finalized as an NPL site on the first formal National Priorities List on September 8, 1983. The 1982 agreement to further investigate the site actually preceded the formal listing of the Site on the NPL. As a result of site characterization activities, Atlantic Richfield and the agencies developed an understanding of the nature and extent of contamination at the Site.

The Site is extremely large and encompasses an area of over 300 square miles. The communities of Opportunity and Crackerville, where the plaintiffs in this case live, are encompassed within the Anaconda Smelter NPL site. As the understanding of site conditions and the CERCLA Program evolved over time the Site was divided into discrete response areas known as Operable Units (OU). By the time the first reference to OUs was introduced in the 1985 NCP proposed rules the concept had already been embraced at the Site. The number and description of OUs has varied over time as understanding of site conditions and approaches to response have evolved. The site is currently organized into five OUs with three of the OUs subdivided into sub-areas sometimes referred to as Remedial Design Units (RDU). The five OUs currently identified are (1) Mill Creek, (2) Flue Dust, (3) Old Works/East Anaconda Yards (subsequently divided into 6 sub-areas, (4) Community Soils and (5) Anaconda Regional Water, Waste and Soils (subdivided into 15 RDUs). The purpose of subdividing the site is to help identify potential response actions that can be started as soon as site characterization

allows and implemented to contribute to the final remedy for the site. The size and complexity of the Site combined with the fact that it is one of the first NPL sites has resulted in an evolving response that has been flexible and has been influenced by both technological and programmatic developments in the CERCLA program and the hazardous materials industry.

Wherever urgent needs for response were identified, and wherever information was available to formulate appropriate response actions, removal actions were considered. If removal actions were necessary and appropriate they were initiated in a timely manner. "Between 1983 and 1986 EPA provided oversight of the smelter demolition, on-site and off-site material transport, and initial stabilization efforts to control fugitive dust from waste sources." (January 6, 2000, EPA, Second Five-Year Review) While the USEPA Superfund Information System indicates that the first removal actions were site-wide in nature and were initiated in 1986, a closer review of the project files, as noted above, indicates that agreements were in place between EPA and Atlantic Richfield as early as 1982. On April 12, 1984 ARCO entered into an Administrative Order on Consent (AOC) to conduct demolition activities at the smelter, and in October of 1984 ARCO entered into another AOC to conduct further investigations to characterize soils, surface waters, groundwater and solid wastes. (September 30, 1996, EPA, Community Soils OU ROD) Removal actions with corresponding general dates are as follows:

1983-1986 Anaconda Smelter Demolition and Initial Stabilization

1986 Mill Creek Removal Activities

1991-1992 Anaconda Yards Removal

1991 Community Soils Removal

1992 Old Works Stabilization

1994 Arbiter Removal

1994 Beryllium Removal

1998 Warm Springs Creek Removal

Characterization of the Site has been an iterative process as is envisioned by the NCP and the appropriate CERCLA guidance. (55FR8720 and October 1988 RI/FS Guidance, Section 3.1). Re-scoping of the initially planned investigations to provide for additional site characterization and alternatives evaluation is commonplace. Over time, the Site has been characterized, alternatives for response have been identified, and remedies have been selected and implemented. The agreements between EPA and Atlantic Richfield executed in the early 1980s were finalized before the substantive response provisions of the NCP were available, in particular the November 1985 NCP and the 1988 RI/FS Guidance.

One of the basic requirements of the CERCLA statute is that the public be kept informed regarding site conditions and response actions and that the public be provided an opportunity to provide information and input as sites are characterized and response actions are evaluated and selected. USEPA is primarily responsible for the public participation process and a Community Relations Plan for the Site was prepared in 1984 by an EPA contractor. Implementation of the plan has been supported by Atlantic Richfield. This plan was prepared before the first formal reference to the requirements for community relations was incorporated into the 1985 version

of the NCP. "The purpose of the community relations program is to provide communities with accurate information about problems posed by releases of hazardous substances and give local officials and citizens the opportunity to comment on the technical solutions to the site problems." (50FR5880) As with the listing of the Anaconda Site on the NPL, where agreements had been reached and agreed to before program requirements had been finalized, the anticipated requirements for Community Relations were being implemented at the Site before they were required by the NCP.

At this time in 2013, the great majority of active remedial response for the Site has been completed. According to the Fourth Five-Year Review, there are nine issues regarding remediation that EPA believes require follow-up actions. As these issues are pursued it is possible that additional issues will be identified. This iterative process is the reason flexibility is a key component of the CERCLA response process. (55FR8700) It is anticipated that Atlantic Richfield, USEPA, MDEQ, local government and the public will continue to work cooperatively to address these nine issues and any others that arise from the Site. To date, four five-year reviews have been conducted. These reviews will continue indefinitely. The nature and extent of contamination at the Site is well established and systems are in place to continue monitoring and awareness of the risks posed by the Site. These systems envision future development of appropriate properties in the Anaconda area, consistent with the goals of CERCLA.

After Atlantic Richfield purchased The Anaconda Company in 1977, the smelter operated for approximately three more years. From the very beginning of the CERCLA program the Site has been categorized as

a voluntary response. (December 30, 1982 FR Notice of first final NPL (47FR58476)). I am not aware of any significant enforcement activity that has been initiated to compel Atlantic Richfield to conduct response activities at the Site because of recalcitrance or any failure to comply with enforceable agreements, CERCLA or the NCP. Where Unilateral orders have been employed it is my understanding that these orders were mutually agreed upon in order to streamline the response process. Furthermore, I am not aware of any demand for penalties for late or non-performance of actions required under enforceable agreements between Atlantic Richfield and any of the governmental entities involved at the Site. EPA did issue one Notice of Violation to Atlantic Richfield in the early 1990's. This NOV was issued because Atlantic Richfield moved forward with some minor remediation work without waiting for EPA to review and approve the work. This is an admirable record for a response at this large and complex Site that has been active as long as it has.

V. FULL STATEMENT OF OPINIONS AND BASIS FOR OPINIONS

OPINION 1: Technology and regulatory requirements associated with the disposal of hazardous wastes have evolved dramatically since the late 1970's. The passage of CERCLA resulted in the development of investigation and remediation processes not envisioned before 1980.

1.1 BASIS OF OPINION: Prior to the passage of federal environmental regulations beginning with RCRA in 1976, most state and local laws imposed limited environmental, health and safety requirements. Requirements that were imposed were general in nature and typically did not require the detailed characterization, monitoring and reporting that present

environmental requirements impose. As a result of this lack of detail and technical complexity, the responsibility for complying with environmental regulations, if they did in fact exist, fell to a relatively low level decision maker in an impacted organization. (Friedman, Frank B.; Practical Guide to Environmental Management, Environmental Law Institute, 2000) In the mining industry, for example, there were many companies operating in the 1960's and the 1970's that did not have formally organized environmental compliance units or environmental compliance procedures. The responsibility for finding disposal sites fell to whoever in the organization ended up with custody of waste material when it was time to dispose of that material. Most early disposal sites were not scientifically sited or engineered based on desires to isolate disposed materials from the environment. Sites were located based on their remote nature, ease of access, the need for fill material and ease of dumping. In the 1960's and 1970's, neither the disposal site operator nor the waste generator typically had any requirement to keep environmental protection records.

Not until roughly the mid 1970's did federal and state statutes begin to provide the framework for regulating and monitoring the disposal of wastes. The passage of CERCLA in 1980 added additional emphasis to the development of technologies that would permit the investigation of disposal sites and an evaluation of the threats these sites might present. The technology for designing and operating landfills evolved greatly during the 1980's and into the 1990's as did the ability to investigate sites that were used before the new regulations had come into force and before technological developments could support the investigations.

The wide ranging liability provisions of CERCLA and the tightening technical requirements for disposal sites were accompanied by the need for generators of waste to investigate the quality and history of sites where disposal would be considered. This need became increasingly clear through the 1980's and today such due diligence is a standard part of not only deciding where to dispose of waste but also whether to buy, rent or lease industrial property for most any use. The Atlantic Richfield responses at the Anaconda Site are exemplary of these developments and by the early 1980's responses typically involved the careful characterization of sites used for disposal of wastes or soils impacted by mining/smelting wastes.

OPINION 2: Scientific research and technology have improved field and analytical techniques since the late 1970's. Accordingly, an understanding of the science and the regulatory requirements to investigate and remediate contaminated sites during the relevant time period is crucial to evaluating the adequacy of early investigations and response actions.

2.1 BASIS OF OPINION: As concerns for the environment and analytical capabilities have evolved over time various substances, naturally occurring and man-made, have come to the forefront of environmental awareness and priority. Ms. Judith Schoeck, Editor, Water Information Center, Inc. of Geraghty & Miller, Inc. for the Fall/1988/Winter 1989 *Geraghty & Miller Fundamentals of Groundwater* training seminars identified the following sources as major recognized sources of groundwater contamination for the decades identified:

1930s: Salt-Water Intrusion

1940s: Industrial Heavy Metals

1950s: Septic Tanks & Cesspools

1960s: Garbage Dumps

1970s: Hazardous Wastes

1980s: Underground Storage Tanks

1990s: Pesticides and Herbicides

Looking at the contaminants/sources of concern over these decades it is obvious that the level of scientific sophistication required to investigate and evaluate the sources was increasing over the years. It is also significant that mining sites did not rise to the level of nation-wide priority that other sources attained. Concern for salt-water intrusion has been on-going but was enhanced in the 1930's by increasing populations and attendant demands on groundwater sources coupled with ever increasing pumping and delivery technology allowing large scale dependence on groundwater for large populations. By the 1970's increasing analytical capability coupled with the evolution of health effects research and the developing science of toxicology made hazardous wastes a growing concern that fostered legislation like CERCLA. The development of the hazardous waste management industry is a direct result of the evolution of enhanced analytical capability and expanded toxicological research of the 1980's and 1990's. Other significant developments in that time-frame are the capacity and capabilities of higher powered computers and the internet. Prior to these innovations toxicological research was conducted in essence by hand and distributed in typed and copied form, essentially through professional journals and associations and through academic libraries. The lowering of analytical capability from parts per million to parts per billion and parts per trillion was also an evolutionary process that took place over many years. Routine analytical procedures producing reproducible

and dependable results in the parts per million/parts per billion ranges were not routinely available in the early 1980's. Even when such levels could be produced the accuracy and precision were generally questionable. (Superfund: A Six Year Perspective; USEPA, Office of Solid Waste and Emergency Response, October 1986; page 15)

Regulations evolved to reflect the state of the science associated with contaminants of evolving concern. Development of this regulatory infrastructure required time and considerable research. For instance in the late 1970's and early 1980's it was uncommon for the limited number of analytical laboratories that were available to produce consistently dependable analytical results for samples at the part per billion and parts per trillion levels. In addition even after receiving the results the industry did not have adequate information on the health implications of those levels. Today contaminants are relatively routinely tracked at parts per billion or parts per trillion levels. Just as detection levels and health effects information evolve over time so do regulatory programs. And indeed, the CERCLA process anticipates advancements in scientific technology and knowledge. As discussed in Opinion 9, if there are later advancements in detection technology or scientific understanding of what is necessary for protection of human health and the environment, the required remedy is to be altered as appropriate.

OPINION 3: Operations at the Anaconda Smelter Superfund Site took place before environmental regulations regarding management, investigation and remediation of hazardous materials were in place.

3.1 BASIS OF OPINION: Mining commenced in the Butte-Anaconda area in 1884 and smelting at the Old Works just South of Stucky Ridge was conducted from

1884 until 1902. At that time the Old Works was taken out of service and smelting activities were moved to the Washoe Reduction Works and continued from 1902 until 1980. The early versions of the Water Pollution Control Act (80-845) passed in 1948 and Amended in 1956 provided for studies of surface and underground water quality but did not provide for water quality standards or detailed regulatory requirements that would guide and regulate industrial operations or discharges. Similarly, the Solid Waste Disposal Act of 1965 which is a precursor to the Resource Conservation and Recovery Act (RCRA) (1976) did not provide detailed regulations to guide the handling and disposal of waste materials. Rather, at the time, the government was trying to understand the actual and potential problems posed by the ever increasing volumes of municipal and industrial wastes as the population grew and the interface between people and wastes became more intense and common. Efforts to address air quality date to the Air Quality Act of 1967 and the Clean Air Act of 1970. Again these efforts did not specify requirements to be met but rather were aimed at understanding the problems at hand and initiating the process of setting standards for regions rather than specific industries and facilities. The recognition of Earth Day and the formulation of the USEPA in 1970 mark the point of concern for the environment that lead to the passage of more demanding and regulatory/enforcement oriented laws such as RCRA in 1976, the Toxic Substances Control Act and the Surface Mining and Reclamation Act in 1977, and finally the CERCLA in 1980. Since that time, RCRA and CERCLA have been amended and a comprehensive body of pertinent regulations and guidance has been developed. CERCLA provided for the revision of the existing NCP and in July 1982 the first CERCLA-

driven NCP was published, which consisted of 22 pages of introductory preamble and 19 pages of regulation. The 1990 version of the NCP, which is the version that guides investigation and remediation today, was substantially more detailed and included 140 pages of explanatory preamble, supplemented by 80 pages specifying the process to be followed in responding to hazardous substance releases and sites. It is clear that the basis of the art and science of responding to the potential and actual threats posed by hazardous substance releases has grown dramatically since the passage of the key statues in the early 1980s.

The Anaconda Smelter Site was identified by the State of Montana as a site of concern in 1980 and was placed on the first NPL in 1983. In essence, investigations and remediation have been ongoing at the Site since 1980 when smelting ended. Prior to that time there was no accepted or required approach for determining the nature and extent of contamination at hazardous sites and similarly there was no well-established methodology for evaluating and quantifying the risks that sites posed to public health and/or the environment. The size and complexity of large mining/smelting sites dictated that time-consuming site characterization activities would be required before appropriate response actions could be identified, planned and implemented. The progress made at the Site is completely consistent with evolving nature of hazardous waste industry and the CERCLA program. The state of the art and science of the industry is dramatically different than it was in the early 1980s. There are over 100 mining and processing related sites that have been listed on the NPL. Of those only 13 have been deleted—removed from the list with completed response actions. All of the sites that have been

removed are only a few acres in size, which is extremely small when compared to the Anaconda Site.

OPINION 4: From the outset, response actions at the Site have been directed and approved by United States Environmental Protection Agency (USEPA) with ongoing input and oversight from the State of Montana Department of Environmental Quality.

4.1 BASIS OF OPINION: CERCLA assigns the responsibility of remedy selection to the President and thus USEPA exclusively and requires that states will be responsible to assure all future maintenance of the selected remedy for the expected life of the actions.

As noted above, the Anaconda Site was listed on the NPL in September 1983. "In 1982 EPA and Anaconda (Atlantic Richfield Corporation) entered into a voluntary agreement to collect data regarding actual or threatened releases of heavy metals, including arsenic, lead, cadmium, zinc, beryllium, and copper, in and around the Anaconda Smelter Site into the environment." (October 1984 Administrative Order on Consent, Docket No. CERCLA-VIII-84-08). Initial categorization of the nature of response actions at the Site was that Atlantic Richfield voluntarily responded. Atlantic Richfield was one of the first potentially responsible parties to enter into an agreement to conduct CERCLA-driven cleanup activities and entered into that agreement with the knowledge that the Site was very large and that response would be a complex undertaking that would take a very long time. Section 122(e)(6) of CERCLA bars any action by a private party at an NPL site where there is an enforcement agreement unless that action has been approved by the President (in this case USEPA). As a result Atlantic Richfield could not have taken actions at the Site independent of or

without the prior authorization of EPA without facing repercussions.

There have been numerous agreements relative to response actions at the Site. The early agreements addressed demolition activities and site characterization. As more information was developed and the nature and extent of contamination at the Site became better understood, agreements were modified and supplemented to provide for organizing the Site into Operable Units. As the impacts of past activities were identified and quantified, risks were evaluated and quantified and response alternatives were screened and evaluated. Throughout this process USEPA and the State directed, oversaw and had final approval of all activities. CERCLA provides that remedies will be selected by USEPA. USEPA and the State conducted the initial preliminary assessments and site investigations of the Site. With input from the State, USEPA developed the scope of the initial site characterization activities. As information about the Site became available, some scoping of future studies was prepared by Atlantic Richfield and its contractors, but in all cases work at the Site had to be approved by USEPA. Some activities were conducted by USEPA; most notably the evaluation of the technical impracticability of response actions to address the actual and potential impacts of contaminated soils on groundwater and contaminated groundwater on surface water.

The remediation of the Milltown Reservoir Sediments (OU 2 of the Milltown Reservoir Sediments/ Clark Fork River Superfund Site) is an example of USEPA's exclusive authority for selection of a remedy under CERCLA. Atlantic Richfield took the lead in preparing the RI and FS for the Milltown Sediments OU. The RI was completed in 1995 and the FS report

was released in 1996. After review by USEPA and the State and input from local stakeholders, a Focused Feasibility Study was prepared in 2000 and a Combined Feasibility Study was released in 2002. Initial evaluations conducted by Atlantic Richfield prior to 2002 addressed containing impacted sediments in place behind the Milltown Dam. USEPA ultimately determined that the most impacted sediments had to be removed, and in April 2003 USEPA released a Proposed Plan for the Milltown Reservoir Sediments OU that called for sediment removal by dredging and local disposal of dredged materials. As required by CERCLA, a public comment period was provided and a public meeting was held. USEPA reported that 4,029 comments, both oral and written, were received. (2004 USEPA Milltown ROD Fact Sheet). In response to the comments received, a revised plan was released in May 2004. The revised plan eliminated dredging in favor of rerouting the Clark Fork River and removing impacted soils and sediment through excavation. The plan eliminated most of the local disposal (approximately 230,000 cubic yards were disposed of locally in a repository at Tunnel Pond) and instead called for rail transport of excavated materials, most of which were sediments, back to the Butte/Anaconda area from which the sediments had originated. USEPA indicated that over 800 comments were received regarding the revised proposed plan and that 98% of these comments were supportive of the revised proposal. (2004 USEPA Milltown ROD Fact Sheet)

The Opportunity Ponds were designated as the new approved disposal location for Milltown Reservoir sediments. One of the justifications for disposal in the Opportunity Ponds included the preference for disposal at a location that was already dedicated to waste management. Use of a dedicated waste management

area eliminated the need to use otherwise un-impacted land in Bandman Flats near the Milltown Dam for waste management. Rail transport was considered safe and not as intrusive as local or cross-county truck transport. After considerable deliberation, EPA determined that rail transportation and disposal of sediments on the Opportunity Ponds would be cost-effective and, as previously stated, would return the sediments to the place of their origin. EPA has also noted that while the volume of sediments from the Milltown Reservoir was significant, estimated at approximately 2,330,000 cubic yards (September 2011 Milltown First Five-Year Review), the volume was only a small fraction of the volume of material already in the ponds, which was estimated in the 2011 Anaconda Regional Water Waste and Soils OU ROD Amendment to be 129.3 million cubic yards. The Milltown Sediments thus comprise approximately 1.8% of the volume of the Opportunity Ponds. As noted above, Atlantic Richfield originally favored managing impacted sediments in place within the Milltown Reservoir, rather than transporting the sediments elsewhere. Upon USEPA's determination that the sediments must be removed, Atlantic Richfield in 2004 developed the dry removal and sediment dewatering approach that minimized the volume of materials to be returned to the Anaconda area and maximized protection of human health and the environment. The sediments returned from the Milltown Reservoir are less than 1% by volume of the mining and smelting wastes at the Site when compared to the total volume of mining related waste materials in the Anaconda area.

OPINION 5: Atlantic Richfield has conducted response actions at the Site to the satisfaction of USEPA and the State.

5.1 BASIS OF OPINION: I have reviewed numerous Administrative Orders on Consent, Unilateral Administrative Orders, Partial Consent Decrees and Consent Decrees that have been issued for response actions at the Site. All of these enforcement agreements include provision for monetary penalties in the form of civil penalties and/or punitive damages for failure to comply with the directions included in the agreement. I have reviewed the administrative record index for the Site and have inquired as to whether there have been any penalties or damages levied in association with response actions at the Site. [As explained above, a Notice of Violation was issued in the early 1990's in response to remediation work Atlantic Richfield conducted without first waiting for EPA's review and approval.] No penalties have been assessed and no damages have been sought from Atlantic Richfield for either failure to comply with the directions included in the enforcement agreements or to meet the prescribed schedules. Based on my review of the materials made available to me I am not aware of any Notices of Violation of the provisions of the enforceable agreements associated with the implementation of response actions at the Site. These agreements provide the required scope of response actions and the anticipated schedules for implementation of the prescribed actions. Included in the scope of activities is the support of the community relations program to be implemented by USEPA. It is my opinion that Atlantic Richfield has complied with the required scopes of remediation work and schedules contained in the enforcement agreements pertinent to response actions at the Site.

OPINION 6: The response actions implemented at the Site have been consistent with the NCP and are protective of human health and the environment.

6.1 BASIS OF OPINION: CERCLA provides the USEPA with the authority to take response measures "consistent with the national contingency plan, which the President deems necessary to protect the public health or welfare or the environment." The President (USEPA) may allow a responsible party to conduct a response action if it is determined that the response "action will be done properly and promptly". (CERCLA 104(a)(1)) The CERCLA process prescribed in the NCP has been followed at the Anaconda Site. The enforcement agreements, the attendant scopes of work, and the work plans for the response actions implemented at the Site reference the NCP and the commitment to implement responses that are consistent with the NCP. These documents reflect the NCP process and the appropriate response guidance. Based on my review of the documents provided to me, my education and training, my understanding of the CERCLA process and attendant guidance and my 32 years of experience conducting, managing and reviewing CERCLA responses, it is my opinion that the response actions implemented by Atlantic Richfield and the USEPA, with full input from the State and the benefit of public input, are consistent with the NCP and have resulted in CERCLA–quality remedies that are protective of human health and the environment. As required by the NCP these remedies either meet the applicable or relevant and appropriate requirements of federal, state and local statutes and regulations or have received a waiver based on the conclusion that no alternative response could practically meet the specified requirements. Waivers typically entail the use of institutional controls and monitoring that provide the requisite protection of human health and the environment. The specific remedies applicable to the plaintiffs' properties in this lawsuit are no exception.

Community Soils Operable Unit (OU 16)

It is important to consider the history of the two operable units (OU's) that most directly impact the Opportunity and Crackerville areas in which the plaintiffs in this case reside. On September 30, 1996 the Community Soils OU (OU 16) became the fourth OU to have remedial actions selected for implementation. The majority of the land in the OU is classified as rural. The RI/FS provided a procedural means to identify residential, commercial/industrial and railroad bed areas and to evaluate alternatives to remedy risks within the OU. There are five communities within the OU; Anaconda, Opportunity, Fairmont, Galen and Warm Springs. Also included are other residential areas within the Anaconda Smelter NPL Site. The Community Soils OU was intended to address all remaining residential and commercial/industrial soils impacted by past aerial emissions and railroad beds constructed of waste materials. (September 30, 1996 USEPA ROD for the Community Soils Operable Unit). This ROD established residential and commercial/industrial action levels for Arsenic for the whole Anaconda Smelter NPL Site, so that if arsenic in sampling results came back above the action level, further response actions would be taken.

The residential component required remediation of residential soils that exceed 250 ppm of arsenic in soil. Remediation included removal of soil to a depth of 18 inches below the ground surface and replacement with clean soil and a vegetative or other protective barrier. Where site conditions dictate that removal cannot be implemented, treatment or other measures will be taken to reduce arsenic levels to below the 250 ppm action level or to prevent exposure. Such alternative actions could include capping, tilling and/or institu-

tional controls. The ROD provided for cleanup of all future residential soils in excess of 250 ppm arsenic at the time of development through the Anaconda/Deer Lodge Community Development Permit System. Institutional controls implementation includes provision of educational information to all residents which describes potential risks and recommendations to reduce exposure to residential contaminants in soils.

The residential component of the Community Soils OU applies to the plaintiffs in this case. Because EPA determined that the contamination identified in the communities of Opportunity and Crackerville did not present a sufficient risk to human health or the environment to warrant inclusion in the focus area, testing of soils in those communities under the ROD was on a voluntary basis. Nonetheless, many of the yards in Opportunity and Crackerville, including some of the plaintiffs' yards, were tested under this program. Yards that tested over 250 ppm (weighted average) in arsenic were remediated pursuant to the ROD.

The commercial component similarly required that soils in excess of 500 ppm of arsenic be addressed through a combination of revegetative techniques and/or engineered covers and that future development at sites with soils greater than 500 ppm at the time of development be addressed through the Anaconda Deer Lodge County Development Permit System. The approach to railroad beds was to construct engineered cover within the Anaconda community to prevent direct contact and to reduce potential for erosion transport of contaminated materials to residential properties and commercial industrial areas. Levels of 250 and 500 ppm of arsenic for residential and commercial railroad bed areas were to be addressed through the use of engineered covers. Railroad areas would be separated

from residential and commercial/industrial areas with barriers to restrict access to the rail bed and to control surface runoff with curbing and retaining walls. Institutional controls would be maintained to restrict access and any future development.

When the proposed plan for the Community Soils OU was published it did not include all remaining current and future commercial/industrial land use areas throughout the NPL Site. These areas were added in the ROD and this significant difference was noted in the ROD. Similarly, as noted in the September 30, 2010 Fourth Five-Year Review, based on studies conducted in 2006 and 2007 regarding the presence of lead in soils and household dust, there was concern regarding exposures to lead in the area including at residences that had been previously remediated based on the arsenic action levels in place. The Five-Year Review indicated that further evaluations were required and that the protectiveness statement for the Community Soils OU was being withheld pending the results of further evaluation. In September 2012 USEPA published a proposal for a ROD amendment to address concerns that arsenic and lead were higher in deeper soils than had been previously anticipated, concerns for lead in yards that had not been cleaned up based on arsenic action levels and concerns related to arsenic and lead in indoor dust in the community. Before the proposed plan was published approximately 1,740 residences in Anaconda and the surrounding rural area were sampled and 350 yards where the average arsenic concentration for the yard exceeded the 250 ppm residential use action level in the surface soil (0 to 2 inches) were cleaned up. (September 2012 USEPA Proposed Plan for ROD Modification Community Soils OU 16). The proposed plan addressed the stated concerns with the exception of arsenic levels in

deeper soils which was to be deferred to the remedial design phase of the Community Soils OU. As a result of the studies leading up to proposed plan USEPA concluded that the original boundaries of the Anaconda Focus Area were too small and should be expanded, that additional consideration should be given to arsenic levels at deeper soil levels, that specific action levels for lead in soils should be developed and that protocols for addressing dust in living spaces should be developed. As a result, USEPA proposed a soil cleanup level for lead in residential soils of 700 ppm. Factoring these concerns into the remedy selection process the proposed plan resulted in the following proposed changes: 1) residential soils with lead in excess of 700 ppm (without regard to the source of lead) would be cleaned to 12 inches with no change for arsenic; 2) indoor dust arsenic > 250 ppm and lead > 700 ppm would be cleaned up; 3) (a) institutional controls in the Development Permit System (DPS) would be expanded to address residential remodeling and the Community Protective Measures Program (CPMP) would be expanded to include information on lead and (b) a multi-pathways program would be developed, working with local government to meet community needs. Industrial/commercial properties were not addressed in this proposed amendment and engineered covers for active railroad beds and yards are still required. Inactive beds and yards will be removed and disposed of under another OU.

As the chronology above demonstrates, the CERCLA process at the Site—including the Five-Year Review process—not only provides for the selection of remedies and regular reporting on operation of the selected remedies, but also provides for oversight of their implementation and protectiveness. When new technology or standards are developed, revisiting the selected

remedies every five years ensures evaluation of operational data and, if necessary, collection and evaluation of additional data, through an independent review of the protectiveness of the remedies in place or being implemented. USEPA as the lead agency for the Site has the responsibility to evaluate the implementation and performance of remedies and to conduct studies or investigations necessary to verify that human health and the environment are being protected. Just as the remedy selection process is subject to mandatory public participation, the Five-Year Review Process incorporates interviews with local stakeholders and the opportunity for the public to comment and indenfity concerns. Public input in the Five-Year Review Process is taken seriously by USEPA and Atlantic Richfield. Stakeholder interviews are a critical part of the Five-Year Review process and studies or investigations may be conducted in response to concerns raised by local stakeholders.

Anaconda Regional Water Waste and Soils Operable Unit 4 (OU 4)

The Anaconda Regional Water Waste and Soils Operable Unit 4 (OU 4) is the largest and most complex OU of the Anaconda Smelter NPL Site covering approximately 300 square miles of southern Deer Lodge Valley and the surrounding foothills. The area consists of agricultural, pasture, rangeland, forests, and riparian and wetland areas which contain wastes, slag, tailings, debris, and contaminated soil, groundwater, and surface water from copper and other metal ore milling, smelting, and refining operations. The ARWWS OU combines the former Anaconda Regional Water and Waste OU, the Anaconda Soils OU, and the Smelter Hill OU such that independent remedial actions are not required

under the previously identified Anaconda Soils and Smelter Hill OUs.

The Administrative Record upon which the September 29, 1998 ARWWS OU 4 ROD is based includes three Remedial Investigations (RIs) and five Feasibility Study (FS) deliverables, human health and ecological risk assessments, the Proposed Plan, and public comments received, including those from Atlantic Richfield and EPA responses. The ARWWS OU ROD was intended to address the culmination of cleanup decisions encompassing potential impacts to surface water and groundwater from soils and waste sources such as tailings and slag. In addition, the ROD was to address risks to human health and the environment associated with arsenic in soils that had not been addressed by other response actions. The ARWWS OU is intended to be the last OU for the Site and is intended to address all remaining contamination and impacts to surface and groundwater, waste source areas (e.g., slag and tailings) and non-residential soils not remediated under prior response actions. The ROD was intended to facilitate coordination of land use decisions made by the Anaconda-Deer Lodge County through adoption of a Master Plan/Growth Policy and Development Permit System, to address land ownership by the PRP (Atlantic Richfield Company (ARCO)), and to address long-term maintenance of wastes-left-in-place through designation of Waste Management Areas, and to facilitate use of institutional controls to support protective engineering remedies specified in the final ROD.

The nature of the ARWWS OU dictated that the remedial investigation and feasibility work for the OU would be a cooperative effort, and accordingly the RI/FS work was conducted by both Atlantic Richfield and USEPA. The Operable Unit History Section of

the ROD details the evolution of the final definition of the OU as well as a basic summary of the authors of RI, FS and Risk Assessment efforts that lead up to the 1998 ROD. Also included is a summary of public participation activities that resulted in the Responsiveness Summary included with the final ROD. As part of the ROD, EPA subdivided the ARWWS OU into five subareas; 1) Opportunity Ponds; 2) North Opportunity Subarea; 3) South Opportunity Subarea; 4) Old Works/Stucky Ridge; and 5) Smelter Hill. Due to the size of the ARWWS OU, the OU has been further subdivided into 15 remedial design units (RDUs) plus two expansion areas.

As noted above, the original ROD was issued September 29, 1998 and included remedies to address soils and waste materials by reducing surface arsenic concentrations to below designated action levels of 250 ppm in residential areas, 500 ppm in commercial/industrial areas and 1000 ppm in recreational/agricultural areas. (As a result of the September, 2011 ROD Amendment, action levels for specified steep slopes and open areas were identified as 2500 ppm.) In addition to removal and disposal in specified waste management areas, reclamation of soils and waste area contamination was also possible through establishment of vegetative covers intended to prevent transport of contaminants of concern to groundwater or windborne and surface erosion to surface waters. Excavated areas were to be filled and graded with clean backfill followed by vegetation, particularly for areas adjacent to streams. Alluvial groundwater underlying portions of the Old Works and the South Opportunity Subarea was to be cleaned to Montana water quality standards through the combination of soil covers, source removal and natural attenuation. Bedrock aquifers and a portion of the alluvial system

in the Old Works, Stucky Ridge and Smelter Hill subareas were determined to be not practicably remediated and a waiver of the cleanup standard was issued for these areas. Reclamation of soils and waste source areas with vegetation was required to minimize arsenic and cadmium movement into the aquifers. For portions of the valley alluvial aquifers where groundwater was below waste-left-in-place, point of compliance monitoring was required to ensure contamination was contained to the perimeter of designated waste management areas. Where excursions were identified treatment options are to be required where practicable. The ROD also called for measures to address surface water contamination through implementation of measures to control runoff, selective removal of source material, and stream bank stabilization. Removed materials were to be disposed in waste management areas. Necessary institutional controls were to be identified and implemented, including, but not limited to, the Development Permit System, the Community Protective Measures Program, and ongoing monitoring of groundwater and surface water. The intent was ultimately to have institutional controls implemented and managed at the local government level.

Following the issuance of the 1998 ARWWS OU 4 ROD, investigation and monitoring at the Site continued as documented in the December 1999 Second Five-Year Review and the September 2005 Third Five-Year Review. In December 2009 USEPA published a proposed plan for the amendment of the ARWWS OU 4 ROD to reflect changes to the Safe Drinking Water Act Maximum Contaminant Level (MCL) for arsenic, which was lowered from 50 micrograms per liter (µg/L) to 10 µg/L. The State of Montana lowered its human health numeric water quality standard for surface and ground water from 20 µg/L and 18 µg/L, respectively, to 10

µg/L (numeric water quality standards set forth in Circular WQB-7).The changes significantly increased the area in which ground water was considered to be contaminated. In addition, as a result of design data collection activities and other site characterization efforts, the Amendment to the 1998 ROD issued by USEPA in September 2011 addressed modified or additionally-required responses impacting wastes and soils, groundwater and surface water. Under the Amendment, various waste management areas were finally located, combined or expanded. In addition, the Uplands Soils Area of Concern was expanded and the Dutchman and Smelter Hills High Arsenic Areas with concentrations in excess of 1000 ppm arsenic were designated. Additional removals were identified for abandoned railroad wastes and for the Blue Lagoon and Yellow Ditch response and the Warm Springs Creek remedy was significantly expanded. On the basis of the additional data collected and the revised standards, various points of compliance were relocated to monitor and protect groundwater from migration away from controlled areas. By the time of ROD Amendment, Atlantic Richfield had constructed a Groundwater/ Surface Water Management System along a portion of the toe of the Opportunity Ponds to address potential migration of arsenic in groundwater as a component of the selected remedy.

The ROD Amendment also provided for a Domestic Well Monitoring and Replacement Program to monitor potentially vulnerable domestic wells in or adjacent to Controlled Groundwater Areas to ensure that these water supplies were safe and to replace them if necessary in the event that trigger levels or standards were exceeded. Under this program, a Domestic Well Area of Concern is identified and domestic wells can be tested. Where contamination in excess of the maxi-

mum contaminant level is confirmed, an alternative water supply will be provided. In the event that a new well is appropriate, the Montana Bureau of Mines and Geology will oversee replacement well construction by a qualified well installer and confirm the quality of water provided by the new well. The program also provides for involvement the Anaconda Deer Lodge County Health Department in investigating non-Superfund related contamination. Under the ROD Amendment, groundwater and surface water standards were updated to incorporate current federal and State requirements, and arsenic standards were waived for certain limited Technical Impracticability Zones. The Amendment documents the ongoing commitment to monitor and investigate the nature and extent of contamination at the Site and to evaluate the adequacy of the selected remedies for the purpose of protecting human health and the environment. The result of the Amendment, which was developed and issued with full opportunity for public input, was to implement changes to selected remedies that USEPA identified and determined to be necessary. The additional cost of these changes was recognized as potentially significant in the proposed plan issued in December 2009. The ROD Amendment, however, indicated, in the discussion of cost-effectiveness, that anticipated increased costs (which had not been estimated and documented in detail) were not expected to exceed the range estimate at the time of the 1998 ROD. That range was estimated to be between $88,000,000 and $150,000,000. Without the benefit of detailed estimating, the Amendment was issued with USEPA's indication that the additional costs were unlikely to exceed the $62,000,000 range of the 1998 estimate. Atlantic Richfield has continued to pursue implementation of this Amendment and in the case of the Groundwater/Surface Water Management System,

with USEPA approval, initiated implementation before the ROD was revised. The changes to the 1998 ROD were initiated at the direction of USEPA and will be jointly implemented by Atlantic Richfield, the local community, various State agencies and USEPA. The Amendment clearly documents the ingenuity and commitment of all local stakeholders to go beyond the minimum requirements to implement innovative solutions in the Anaconda area that are protective of human health, the environment and the welfare of the local community.

The ARWWS ROD also applies to the property of the plaintiffs in this case. Atlantic Richfield initially on a voluntary basis, and later as a mandatory program under the ROD Amendment, tested the domestic wells of Opportunity and Crackerville residents, including the plaintiffs on a regular basis. Since 2009, the testing has been performed by the Montana Bureau of Mines and Geology. If the well tests under 5 ppb arsenic, it is considered clean and no further action is taken. If it tests over 5 but under 10 ppb arsenic, the well is monitored annually for a period of 3 years to make certain it does not exceed 10 ppb. If the well tests over 10 ppb arsenic, the well is replaced and bottled water is provided to the homeowner in the interim until replacement is complete and water quality is confirmed.

OPINION 7: The responses taken at the Site have been iterative in nature as prescribed by the NCP and the 1988 RI/FS guidance.

7.1 BASIS OF OPINION: The purpose of conducting an RI is to determine the nature and extent of contamination "such that informed decisions can be made as to the level of risk presented by the site and the appropriate type(s) of remedial response."

"An iterative monitoring process is then implemented so that, by using increasingly accurate analytical techniques, the locations and concentrations of contaminants that have migrated into the environment can be documented." (Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, USEPA, September 1988). The Anaconda Smelter Site was one of the first Superfund remedial responses to be undertaken and one of the first mining/smelting "mega" sites as well. Work at the Site began as early as 1982, before the current RI/FS guidance was available. (1982 Preliminary Evaluation, Fred C. Hart). As a result of the magnitude of the challenges posed by the Site, the initial enforcement agreements required that the Site first be initially characterized and fully anticipated subsequent site characterization efforts based on the findings of the initial investigations. Work by the Anaconda Minerals Company began in 1983. (Comprehensive Environmental Study "Screening Study: Anaconda Smelter Site", May 1, 1983). The preface to the RI/FS Work Plan that was attached to the October 22, 1984 Administrative Order clearly stated that "EPA and [Anaconda Minerals Company] recognize the need to undertake additional studies" that were not defined at that time but that would be agreed upon and initiated on "an expedited basis" as necessary. (September 1984 AOC, page ii). What was initially known was that characterizing the Site would be an evolving process that would identify the impacts of past activities, the risks posed by those impacts, and ultimately the response actions necessary to address those activities. Characterization of the Site has been ongoing since 1982, and response actions to address risks posed by the Site have taken the form of various removal and remedial actions. Where response actions were deter-

mined to be urgent, time critical removals and non-time critical removals have been conducted as provided by the NCP. Similarly, where necessary and appropriate, operable units have been identified to allow for focus and more timely initiation of responses. The 1985 NCP anticipated that the initial scope of remedial investigations would often have to be expanded, "During the remedial investigation, the original scoping of the project may be modified based on the factors in 300.68 (e)". (November 20, 1985 Final Rule NCP, 50FR47973). One of the factors identified in 300.68 (e) is the extent to which the substances have migrated or are expected to migrate from the area of their original location." (50FR47974) The December 21, 1988 Draft Proposed NCP at 300.430 (a) (2) also envisioned that the RI/FS process would be flexible, "The scope and timing of these activities should be tailored to the nature and complexity of the problem and the response alternatives being considered." (53FR51503) The language in the draft rule carried over unchanged in Section 300.430 (a) (2) of the 1990 NCP that now governs response actions. (55FR8846)

Because of the uncertainties associated with the RI/FS process neither the RI/FS Guidance nor the various versions of the NCP specify an anticipated duration for conduct of response actions. The reason for this is that each site is unique and poses unforeseen challenges that cannot be predicted. Many of the sites originally listed on the first NPL are still undergoing response actions. The process followed at the Anaconda Site is the process prescribed under CERCLA and is reasonable and appropriate for the scope and complexity of the identified site conditions.

OPINION 8: Community involvement has been ongoing and consistent with the NCP since the initial responses at the Site began.

8.1 BASIS OF OPINION: Section 113 (j) (2) of CERCLA identifies "Participation Procedures" for removal and remedial actions. Section 117 of CERCLA requires the opportunity for comment on a proposed response and that a response be provided for any significant comments received. The first NCP to address the requirements of CERCLA, published July 16, 1982 (FR4731180), did not address expectations for public information or participation. The first references to community relations and public comment on remedy appear in the February 12, 1985 NCP Proposed Rules. (50FR5880). The September 22, 1984 administrative order was already in force at the Site when this first reference to public participation was incorporated into the NCP process. Section 25 of the 1984 order included the provision for public review and comment on the draft RI and FS reports. Section 45 of the December 20, 1985 "Flue Dust" Order provides that upon the last signature to the order availability of the order would be published in newspaper of general circulation to provide for review and comment by the public. Before the initial NPL was finalized in the Federal Register, the public, as required by CERCLA, had the opportunity to comment on the Site and related concerns. After the enforcement agreements were executed the responsibility for development of a Community Relations Plan belonged to USEPA, a Community Relations Plan was prepared by USEPA's contractor CH2M Hill in 1984. Various enforcement agreements between USEPA and Atlantic Richfield assigned responsibility to support the community information process to Atlantic Richfield. The Responsiveness Summary to the March 8, 1994 Old Works East Anaconda Development Area OU 07

Record of Decision indicates that, "Since 1983, EPA and [Montana Department of Health and Environmental Services] have produced a series of Progress Reports and Fact Sheets that discuss issues at the Anaconda Smelter NPL Site". Accordingly from the very outset of response activities, the public has had access to information and a form for input to the scoping of site characterization and the selection of remedies. The OWEADA OU ROD also provides a general chronology of public information. The September 30, 1996 Community Soils OU ROD identifies several community groups that were involved in providing input to site characterization and remedy selection including the Anaconda-Deer Lodge Environmental Advisory Council, Citizens in Action (Anaconda-Deer Lodge Reclamation Advocates), the Arrowhead Foundation, and Opportunity Concerned Citizens. The September 29, 1998 Anaconda Water Waste and Soils OU Record of Decision responsiveness summary references the 1984 Community Relations Plan and a 1992 update. The ARWWS ROD also notes that interviews conducted by USEPA indicated that as part of the Community Relations Plan Amendment process, interviewees stressed that they heard from ARCO frequently, largely due to ARCO's office being located in Anaconda.

Atlantic Richfield, USEPA and the State take seriously the need to provide public information and public comment opportunities. The responsiveness summaries attendant to each of the RODs produced for selected remedies at the Site document this commitment as early as 1983—before any CERCLA requirements for public participation had been specified. The purpose of the public comment process is to allow citizens to raise questions and objections to all aspects of remedy selection. The adequacy of site characterization (nature and extent of contamination), assessment of risk to

human health and the environment, and the appropriateness and extent of a remedy may all be questioned, and the USEPA is required to provide a substantive response to any significant questions or comments. Section 300.430 (f), in particular sections 300.430 (f) (2), (3) and (4), provides the requirements for remedy selection. It is my opinion that these requirements have been followed and as a result the selected remedy is documented to be consistent with the NCP. Accordingly, the public has had ample opportunity to comment on whether the selected remedies are protective of human health and the environment as required by CERCLA.

The level of communication between the public, local governments, regulators and the responding private party, Atlantic Richfield, on this project is exemplary. I found the substance and tone of comments provided in conjunction with proposed remedy reviews to be constructive and in many instances appreciative. In my experience this type of input is only likely when the public has been consistently well informed and included in the remedy selection process.

OPINION 9: Since the remedies at the Site include the containment of hazardous substances, the remedies are subject to the formal Five-Year Review process to confirm the adequacy of protection of human health and the environment. The Five-Year review process ensures and documents the commitment to implementation of the selected remedy and updates selected remedies as appropriate.

9.1 BASIS FOR OPINION: CERCLA 121(c) provides for a review of any remedial action that results in any hazardous substances, pollutants or contaminants remaining at the site. The NCP addresses the expectations for five-year reviews in Section 300.430

(f) (4) (ii). Such review shall be conducted no less than each 5 years after the initiation of the remedial action to assure that human health and the environment are being protected by the remedial action being implemented. The USEPA published Comprehensive Five-Year Review Guidance in June 2001.

To date, four five-year reviews have been completed. The five-year reviews document USEPA's ongoing oversight of the protectiveness of implemented remedies and the progress being made to address outstanding issues at the Site. Community interviews are conducted as part of the five-year review process, providing yet another opportunity for the public to raise concerns and to comment on progress at the Site. The conduct of the most recent interviews was announced in the Anaconda Leader on April 16, 2010. In addition to the newspaper advertisement, a large group of interested parties which included community groups, public and private institutions, and known interested individuals, were invited to participate and to encourage other interested parties to participate. As part of the interview process approximately 25 people were interviewed.

As a part of the review process, each of the five operable units was evaluated. This evaluation included a discussion of how the selected remedy has been implemented to date, the progress that has been made since the last five-year review, the various aspects of a technical assessment (is remedy functioning as proposed, have assumptions made at the time of remedy selection proved to be valid, has new information come to light requiring additional evaluation or changes), and identification of issues and recommendations. Finally the assessment of protectiveness of responses to date is provided in a protectiveness summary. Each OU and all remedial design units within each OU are

evaluated and any necessary additions or changes are identified and documented. In essence, the five-year review provides a summary of progress to date and identifies the response activities that will be pursued going forward. As time has passed and the CERCLA program has evolved, the focus of the five-year review has also been refined. The focus of these reviews is also refined based on the input of the public and interested stakeholders. In fact, any interested party has the opportunity to become involved and raise issues that EPA will then consider in the five-year review.

The five year review is a critical evaluation of the progress being made toward completion of the implementation of the selected remedy. Where there are needs for the collection of additional information or where there is a need to alter or supplement a selected remedy these needs will be documented and USEPA and the responding party, in this case Atlantic Richfield, will be required to take the necessary steps to address the identified issues and recommendations. As necessary, scopes of work or enforcement agreements will be modified to reflect the conclusions of the five–year reviews. For example, the latest and fourth five-year review indentified necessary additional activities required to complete the remediation of the Smelter Hill Facilities Remedial Design Unit. Repositories had been constructed within this area in the 1990s and the new Beryllium repository was constructed in 2004. The ARWWS OU ROD was issued in 1998. Following the finalization of the fourth five year review in September 2010, the Smelter Hill Facility administrative order was completed in June of 2011 and addresses necessary activities identified in the five-year review.

The proposed plan for a Community Soils OU ROD amendment discussed in Opinion 6 is an example of

the commitment of USEPA, the State and Atlantic Richfield to update and modify the selected remedies as new information, regulations and/or technology are developed. This proposed plan incorporates changes in regulatory standards for lead in deeper soils, lead in yards that were not cleaned up, and arsenic and lead in indoor dust.

VI. COMPENSATION

For the services associated with this assignment, ARCADIS U.S., Inc. is being compensated at a rate of $350 per hour.

VII. PRIOR TESTIMONY

The other cases in which I have given trial or deposition testimony within the past four years are as follows:

Name of Case	Court	Trial or Deposition Testimony
Palmer, et al v. 3M Company Civil File No. C2-04-6309	State of Minnesota District Court County of Washington Tenth Judicial District	Deposition – July 30, 2008 Trial - June 3-4, 2009
Coffey Et Al. v. Freeport-McMoRan Copper & Gold Inc., Et Al. Case No. CJ-2008-68	State of Oklahoma District Court of Kay County	Affidavit - December 13, 2010 Deposition – January 5, 2011
Doe Run Resources v. Continental Casualty and Certain Underwriters at Lloyd's of London	Circuit Court for the County of St. Louis, State of Missouri	Deposition - April 7, 2011

VIII. PUBLICATIONS

Cost-Effective NCP Compliance for the Lead Agency - An Overview, Richard E. Bartelt, P.E., ARCADIS U.S., Inc., 2009, prepared for United States Coast Guard Civil Engineering Unit Cleveland.

Successful In-situ Treatment of Chromium Contaminated Groundwater for Former West Pullman Works, submitted to AWMA 2008 Martin J. Hamper, P.G., Richard E. Bartelt, P.E.

From Misery to Electric Energy: A Brownfields Success Story West Pullman Works, Gregory A. Vanderlaan, Richard E. Bartelt, P.E., et al., AWMA 2011.

25 Years of CERCLA and Counting, Richard E. Bartelt, P.E., ARCADIS U.S., Inc. January 16, 2006, Air and Waste Management Association

[Expert Report of John R. Kane (Apr. 15, 2013)]

Expert Report
John R. Kane, LG, LHG
CEO/President
Kane Environmental, Inc.
3815 Woodland Park Avenue North
Suite 102
Seattle, WA 98103

Gregory A. Christian, et al., v. BP Amoco Corporation, et al., Atlantic Richfield Company, et al., Cause No. DV-08-173

Qualifications

I, John R. Kane, have worked in the Environmental Consulting field for 26 years. I am currently the CEO/President of Kane Environmental, Inc. based in Seattle, Washington. I have been working in this position for 13 years. My CV is attached.

During my 26 years of professional experience my main focus has been on contaminant investigation and remediation of soil and groundwater. My experience includes a wide variety of contaminants including metals, solvents, pesticides, PCBs, wood treating chemicals and petroleum.

I have supervised, designed, installed, and monitored various types of remedial technologies including soil vapor extraction, groundwater sparging, bioremediation, bioventing, monitored natural attenuation, passive barrier wall treatment, and excavation and off-site disposal.

Scope of Inquiry

On behalf of the plaintiffs, the owner's of private property located in Opportunity and Crackerville, Montana, I have been asked to investigate metals

contamination in soil and groundwater on their property to determine whether restoration for their property is technologically and economically feasible and if so, to determine the cost and scope of work for restoration. I have completed similar work for private property locations associated with the former smelter located in North Everett, Washington, and residential properties in the vicinity of the former Asarco smelter in Tacoma, Washington. I worked as a field geologist on the Old Works and Smelter Hill sites from approximately 1987 to 1989 timeframe for a previous employer.

Opinions and information contained in this disclosure are based on review of available site information provided in ARCO and governmental documents, site investigation data results, and sampling data from Kane Environmental's soil, indoor dust, and groundwater sampling/testing work. ARCO's reports contain data collected by other consultants and contractors and the data were reviewed and compared with data collected by Kane Environmental and used for the basis of the opinions expressed in this disclosure. The attachments to this report may be used as exhibits at trial. Due to the volume of reference documents and data, and on-going investigations by ARCO's consultant and Kane Environmental, it is my intention to review and collect additional data before trial. I reserve the right to modify and/or supplement my opinions and attachments based on the review or collection of additional data and/or reports.

Facts and Opinions

Based on my review of existing data, 1 expect to testify to the following opinions:

1) Operations at the former Anaconda Smelter (Smelter Hill) resulted in significant and substantial contamination of arsenic and heavy metals detected above background concentrations from smelter emissions in soil and groundwater on private property in Opportunity and Crackerville.

2) Metals in soil and groundwater have known health effects and some are known carcinogens.

3) ARCO's testing and analysis provided inadequate characterization of the extent of metals soil and groundwater contamination above background in the residential areas in Opportunity and Crackerville.

4) Contrary to ARCO's representations, restoration of contaminated private property residential soils and shallow groundwater is feasible using accepted methods of cleanup.

5) The estimated cost to restore soil and groundwater on the plaintiffs private property is attached in Table 1.

6) Concentrations of arsenic and heavy metals were found in dust sampling conducted inside plaintiffs residences.

SUMMARY OF GROUNDS FOR OPINIONS

1) Operations at the former Anaconda Smelter (Smelter Hill) resulted in significant and substantial contamination of arsenic and heavy metals detected above background concentrations from smelter emis-

sions in soil and groundwater on private property in Opportunity and Crackerville.

I have been asked to determine whether historical smelting operations at Smelter Hill resulted in concentrations of metals in soil and groundwater above background on private property owned by citizens of Opportunity and Crackerville that have brought this lawsuit. I determined the concentrations of arsenic and cadmium, copper, lead, and zinc in the soil and groundwater on the private properties. To determine whether the properties are contaminated, background concentrations of arsenic, cadmium, copper, lead and zinc were calculated from soil collected at the private properties, and from drinking water well data from the Opportunity and Crackerville areas obtained from the Montana Bureau of Mines and Geology. Based on my education, experience and review of historical data related to operations at Smelter Hill, I concluded that the most likely cause of the elevated arsenic and heavy metals in the soil and groundwater in Opportunity and Crackerville is from the operations at Smelter Hill.

1a. Background Concentrations of Arsenic and Other Heavy Metals

Background soil and groundwater concentrations were calculated for Opportunity and Crackerville based on soil samples collected during Kane Environmental's investigation and using drinking water well data collected from drinking water wells in Opportunity and Crackerville areas from the Montana Bureau of Mines and Geology database.

Soil samples collected with a starting depth of 2 feet or more and beneath the surface from each sampling location in the unsaturated zone, was used to calculate background concentrations of arsenic, cadmium, copper,

lead and zinc. Soil analytical data from the June and October 2012 soil sampling investigations were used. Laboratory duplicate analyses were used in the calculations. One-half the laboratory test detection limit was considered non-detectable concentrations of metals. A total of 168 samples were used to calculate background concentrations. The following mean (average) for each metal in parts per million (ppm) is:

Arsenic	12.98
Cadmium	0.232
Copper	17.94
Lead	9.577
Zinc	38.76

The median concentrations in ppm of the five metals is:

Arsenic	6.445
Cadmium	0.111
Copper	11.75
Lead	7.315
Zinc	32.70

Groundwater background concentrations were calculated using total metals from the Montana Bureau of Mines and Geology, using wells greater than or equal to 20 feet below ground surface. Only one duplicate laboratory result was reported in the database and it was not used in the background calculations. Test method detection limits were used because method detection limits were not provided in the Montana Bureau of Mines and Geology drinking water database. A total of 107 samples were used from a depth greater than or equal to 20 feet.

The following mean (average) for each metal in parts per billion (ppb) is:

Arsenic	1.134
Cadmium	0.432
Copper	6.856
Lead	1.106
Zinc	37.67

The median concentrations of the five metals is:

Arsenic	0.515
Cadmium	0.50
Copper	4.64
Lead	0.50
Zinc	5.34

Based on these sampling results, a reasonable range of background levels of arsenic and other heavy metals in soil and shallow groundwater is between the median and mean background concentrations.

1b. Levels of Arsenic and Other Heavy Metals Present in Soil and Groundwater.

ARCO's consultant collected groundwater samples from wells in the Crackerville area and south of Opportunity in 2003. Figure 1 (South Opportunity Area of Concern Investigation Sample Locations) and Figure 2 (Dutchman Creek Area of Concern Investigation Sample Locations) are provided in the appendices for reference. Concentrations of arsenic, cadmium, copper, lead, and zinc were found above background in some of the groundwater samples collected by ARCO's consultant.

On the plaintiffs properties, Kane Environmental conducted soil sampling and groundwater investigation

in June and October 2012, and indoor dust sampling and additional soil and groundwater sampling in March 2013. Soil sampling conducted by Kane Environmental is consistent with and similar to the sampling conducted by ARCO's consultant during the summer of 2012.

Our findings reveal concentrations above the calculated background concentrations of arsenic, cadmium, copper, lead and zinc in soil and groundwater in Opportunity and Crackerville. Concentration contour maps showing distribution of contamination are provided in the attachments of this report. Figure 4-16 (Extent of Arsenic Contamination in Groundwater in the ARVVW&S OU Final Site Characterization Report) prepared on behalf of ARCO shows an approximate north to northeastern extent of arsenic contaminated groundwater at or near Highway 1. Our findings are contrary to the findings shown in Figure 4-16 and discussed in Section 7.4 of the ARVVW&S OU Final Site Characterization Report prepared on behalf of ARCO.

Sampling data has been reviewed, evaluated, and validated using guidance and quality control criteria documented by recognized analytical methods. See attached EcoChem, Inc. reports October 12, 2012 and April 1, 5, 8, and 10, 2013, incorporated herein.

1c. The Cause of the Contamination of Soil and Groundwater in Opportunity and Crackerville, MT.

The most likely reason for the elevated levels of arsenic and heavy metals in the soil and groundwater on the private property of the citizens of Opportunity and Crackerville is the operation of the smelter in Anaconda, MT by the Defendants or their predecessor corporations. Opportunity, Montana, is located at the south end of the Deer Lodge Valley, east of Anaconda,

and Crackerville is also located east of Anaconda and south of Opportunity. Both communities are downwind of the giant Washoe smelter that operated near Anaconda from 1902 to 1980. The Anaconda Company and its predecessors operated the smelter. The Anaconda Company (known over time as the Anaconda Gold and Silver Company, the Anaconda Mining Company, the Anaconda Copper Mining Company, and The Anaconda Company) operated metallurgical reduction works (called smelters) at Anaconda from 1884 until 1980. Throughout that period, the smelters discharged smoke containing hazardous materials, including sulfur dioxide, arsenic, copper, and other heavy metals.

I have reviewed the expert report of Dr. Quivik. According to Dr. Quivik:

> *When the smelter opened in 1902, it was discharging an estimated 25 tons of arsenic trioxide per day, and in 1903 that figure rose to about 39 tons per day, before the ACM closed the smelter and installed the flue system and the 300-foot stack. After the smelter reopened, it was discharging about 23-30 tons of arsenic trioxide per day, until copper production began to increase in the 1910s. The stack discharged about 40 tons of arsenic trioxide per day in 1911 and peaked at about 62 tons per day in both 1916 and 1918. After the construction of the Cottrell electrostatic treaters and the 585-foot stack, discharges of arsenic trioxide dropped to about six tons per day throughout the 1920s.*
>
> * * *
>
> *Copper discharges peaked in 1916 and 1918 at about eight tons per day. With the Cottrell*

> *treaters, copper discharges dropped to below 0.2 tons per day. Lead discharges peaked at more than ten tons per day in 1916 and 1918, and then dropped to about 1.5 tons per day in* the *1920s with the use of the Cottrell treaters.*

The smelter operated until 1980, and continued to deposit arsenic and other heavy metals onto the soil in Opportunity and Crackerville.

The Final Remedial Investigation Report for the Anaconda Regional Water, Waste & Soils Operable Unit (ARWW&S OU) prepared for ARCO and dated February 1996 states in the conclusions section that:

> *Based on all available data, two potential sources responsible for low-level contamination of dissolved arsenic in groundwater of the alluvial aquifer have been identified in the vicinity of Willow Creek near MW225. The first source is an area of tailings located in the floodplain between Willow Creek and Silver Bow Creek. The second source is contaminated soil due to widespread deposition of smelter emissions.*

Both the United States Environmental Protection Agency (U.S. EPA) and Montana Department of Environmental Quality (DEQ) likewise concluded that the contamination in Opportunity and Crackerville was due to the smelter operation. U.S. EPA and DEQ issued the ARVVW&S OU Record of Decision (ROD R08-981096 1998) including the rural communities of Opportunity and Crackerville in the South Opportunity Subarea. A ROD Amendment for the ARVVW&S OU was issued by both agencies in September 2011.

The ROD and ROD Amendment state that "*widespread areas of contaminated soil are characterized in*

the South Opportunity Subarea as a result of deposition of smelter stack emissions". These documents further report that groundwater contamination in the South Opportunity Subarea is characterized in portions of the alluvial aquifer underlying areas of contaminated soils which are flood irrigated on a year round basis in the vicinity of the Yellow Ditch, and in portions of the aquifer underlying wastes and contaminated soils at the Blue Lagoon. The depth of ground water contamination in this portion of the aquifer is reportedly estimated to range from less than 10 feet to approximately 30 feet. Potential loading sources for metals to the aquifer in this area include leaching of metals from wastes in railroad grade material, from contaminated soils, and from contaminated sediment of the Blue Lagoon. The depth of ground water contamination at the Blue Lagoon is thought to be limited to the upper 10 feet of the aquifer.

The ROD documents both report that the results of these studies indicate that arsenic is present in the ground water at the top of the aquifer over a large area of South Opportunity at concentrations up to 150 ppb. This plume is limited to the upper few feet of the aquifer and has not been detected in any domestic wells, which tend to penetrate past the top of the aquifer. This plume occupies two general areas: along Willow Creek and between Willow Glen Ranch and the Town of Opportunity. Based on historic mapping, this widespread plume coincides with areas that have been flood irrigated. One monitoring well, MW-232, has contained significantly higher arsenic than the ground water elsewhere in South Opportunity. This monitoring well is downgradient of Yellow Ditch and in an area that was irrigated before 1996. Possible sources of elevated arsenic in the MW-232 area include contaminated sediments in Yellow Ditch, contaminated

water flowing into Yellow Ditch, or a combination of the two. A ground water investigation conducted in 2002 identified elevated arsenic in shallow ground water in one monitoring well in the Crackerville area. (Well SOSPZ26 contained 46 to 79 ppb arsenic in the area between Yellow Ditch and Silver Bow Creek just south of Crackerville).

The ARWW&S OU Final Site Characterization Report South Opportunity Area of Concern dated September 2011 provides soil, surface water and groundwater data analysis, and conclusions. Section 7.1 Widespread Arsenic Plume states "*Arsenic is present in ground water over* a *large* area *of South Opportunity at concentrations up to 150 µg/L (micrograms per liter or ppb). This plume is limited to the upper few feet of the aquifer and has not been detected in any domestic wells which tend to penetrate past the top* of *the aquifer*".

2) Metals in soil and groundwater have known health effects and some are known carcinogens.

Ingestion of inorganic arsenic increases the risk of skin cancer and cancer in the liver, bladder, and lungs. Inhalation of inorganic arsenic increases the risk of lung cancer. The Department of Health and Human Services (DHHS) and the U.S. EPA have determined that inorganic arsenic is a known human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic arsenic is carcinogenic to humans.

Most cadmium used in the United States is extracted during the production of other metals such as copper, lead, and zinc. Long-term exposure to cadmium in air or water leads to a buildup of cadmium in the kidneys, and other long-term effects are lung

damage and fragile bones. DHHS and IARC have determined that cadmium is a human carcinogen.

Copper is released to the environmental by mining and waste water releases into creeks and rivers. Breathing high levels of copper can cause irritation of the nose and throat, and ingestion of high levels of copper can cause damage to the liver and kidneys.

Lead is found in the environment from mining operations and other sources. Lead can affect almost every organ and system in the body, and the main target is the nervous system in adults and children. Exposure to lead can damage the brain and kidneys. DHHS has determined that lead may be a human carcinogen.

3) ARCO's testing and analysis provided inadequate characterization of the extent of metals soil and groundwater contamination above background in the residential areas in Opportunity and Crackerville.

My review of ARCO sampling in Opportunity and Crackerville found limited sampling of soil and groundwater in both communities. For example, a shallow groundwater investigation reported in the Final South Opportunity Ground Water Area of Concern Investigation and Dutchman Creek Ground Water Area of Concern Investigation Data Summary Report (DSR) did not include groundwater sampling north of Highway 1. Figure 1 showing sampling locations in this report is provided in the appendices. There has been insufficient characterization of soil and groundwater contamination compared to my analysis summarized in Opinion 1.

Background soil and groundwater concentrations were calculated for Opportunity and Crackerville based on soil samples collected during Kane Environmental's investigation and using drinking water well data

results collected by the Montana Bureau of Mines and Geology from drinking water wells in Opportunity and Crackerville.

4) Contrary to ARCO's representations, restoration of contaminated private property residential soils and shallow groundwater is feasible using accepted methods of cleanup.

4a. Restoring Surface Soil to Background Levels of Arsenic and Other Heavy Metals is Feasible and Practicable. Removal of near-surface residential soils has occurred in some Opportunity and Crackerville private properties. Clean import fill material will be immediately placed in the excavated areas up to 22-inches in depth with a 2-inch thick layer of topsoil and leveled for sod placement for the final cover. The estimated amount of soil to be removed is approximately 430,000 cubic yards (approximately 650,000 tons). Clean import fill can be provided by local sources, used to provide clean fill for the Silver Bow Creek restoration. Removal of the upper 2-feet on private property is appropriate based on calculated site-specific background concentrations for Opportunity and Crackerville.

4b. Restoring Shallow Groundwater to Background Levels of Arsenic and Other Heavy Metals is Feasible and Practicable.

The restoration of groundwater to background levels of arsenic and other heavy metals can be accomplished by installing an underground Passive Reactive Barrier (PRB) wall which contains zero valent iron (ZVI) mixed with clean imported sand. The trench is estimated to be 8,000-foot long, 15-foot deep and 3-foot wide up-gradient of Opportunity. Shorter PRB walls would be placed up-gradient of Crackerville properties. The

trenching can be completed either by biopolymer trenching or continuous trenching techniques. For the biopolymer approach, as the trench is excavated, biopolymer slurry is added to the trench to provide stability to the excavated trench walls. Recirculation wells are spaced along the length of the trench. After placement of the ZVI and sand, an enzyme is circulated through the wells to start the biopolymer breakdown process and allow the groundwater to flow through the ZVI PRB. The continuous trenching machines allow simultaneous excavation and backfilling with an open trench. Excavation is performed by a cutting chain immediately in front of a trench box that extends the width and depth of the finished trench. As the trencher moves forward, the ZVI/sand mixture is added to the trench. A PRB pilot test would be required to determine the best installation approach and to determine the amount of ZVI for the PRB walls. These underground PRB walls will be designed to remediate shallow groundwater in Opportunity and Crackerville.

5) The estimated cost to restore soil and groundwater on the plaintiffs private property is attached in Table 1.

Reasonable and necessary costs associated with remediation of plaintiffs' private property are summarized in Table 1, attached. Costs include the removal and restoration of the private properties and transport of the soil to a licensed landfill in Spokane, Washington. An estimated 8,000-foot long, 15-foot deep and 3-foot wide PRB wall would be constructed upgradient of Opportunity, and shorter PRB walls would be placed upgradient of individual Crackerville properties. Soil removal is estimated to take 20 months and installation of the PRB walls 4 to 6 months.

6) Concentrations of arsenic and heavy metals was found in dust sampling conducted in plaintiffs residences.

Kane Environmental conducted an indoor dust survey in 51 residences owned by the private property owners. A portion of the dust analytical results have been data validated, and remaining samples are currently under data validation. Concentrations of arsenic and heavy metals can be removed by HEPA vacuum and monitored with periodic sampling.

/s/ John R. Kane
John R. Kane

4/15/13
Date

[Expert Report of David M. Emmons (Apr. 15, 2013)]

MONTANA SECOND JUDICIAL DISTRICT COURT
SILVER BOW COUNTY

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Cause No. DV-08-173 BN

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Christian, *et al.*

v.

BP Amoco Corporation, *et al.*

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EXPERT REPORT
OF DAVID M. EMMONS, PhD.

/s/ David M. Emmons
David M. Emmons

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April 15, 2013

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INTRODUCTION

I am David M. Emmons, Professor of History Emeritus at the University of Montana in Missoula, Montana. I am a professional historian. My educational background and professional experience are detailed in my Curriculum Vitae attached as Exhibit A.

In the past four years, I testified once by deposition in the case of PPL Montana, LLC v. State of Montana, No. CDV-2004-846, Montana District Court, Lewis and Clark County.

The publications that I authored within the last ten years are set forth in my Curriculum Vitae attached as Exhibit A.

I am being compensated by Defendants (generally referred to as "AR") as a testimonial expert in this matter at the rate of $300.00 per hour for pre-trial consulting and $350.00 per hour for deposition and trial testimony.

MATERIALS CONSIDERED

The materials I have considered in the preparation of this report are those documents identified in the footnotes to my report as well as other historical documents relating to the history of The Anaconda Company (by its various names—I refer to it as "Anaconda," "ACM," or simply "the company") and its corporate successors; the towns of Anaconda, Opportunity, Crackerville, and Butte; the effects of water and airborne emissions on the Deer Lodge Valley; and the litigation resulting from those emissions. Cited and considered-by documents are listed in Exhibit B, and copies of those documents have been delivered to AR's counsel and are available to the attorneys representing the plaintiffs in this matter upon request. I have

also relied on my 45 years of experience studying, teaching, researching, and writing about 19th and 20th century American history in general, and the history of Montana and the Butte/Anaconda area specifically.

SUMMARY OF OPINIONS

In this report, I present a focused history of The Anaconda Company, concentrating on its operations in the Deer Lodge Valley in southwestern Montana. I discuss the early history of the company, how it decided to locate its smelter in the Deer Lodge Valley, the various iterations of that smelter, and the founding of the city of Anaconda. I then turn to the history of pollution-related litigation against ACM in the early part of the 20th century, how those suits were resolved through trials, settlements, and land swaps, and how the company protected itself from similar lawsuits in the future through land purchases, releases, and easements. I examine the history of the town of Opportunity (where many of the plaintiffs in this case live) and how that town was founded as a response to the early pollution lawsuits. I conclude with an examination of the social, economic, and cultural significance of The Anaconda Company to the communities in the Deer Lodge Valley and to the State of Montana as a whole.

As noted above, I am a professional historian, and to arrive at the opinions in this report, I followed the historical method. In short, the historical method is the generally recognized and well-established set of standards, procedures, and analyses used by professional historians to produce the most accurate rendition of past events possible based on the historical record

and the broader historical context.[1] It is my professional judgment that the opinions I express in this report are accurate to a reasonable degree of historical certainty.

OPINIONS

I. A BRIEF HISTORY OF THE ANACONDA COMPANY AND SMELTING IN THE DEER LODGE VALLEY

A. Anaconda: The Syndicate, The Smelter, and The Town, 1876-1891

The story of the Anaconda Copper Mining Company began in 1876 when the Walker brothers, mine owners in Ophir, Utah, sent Marcus Daly to investigate mining properties in the mining camp of Butte City, in the Summit Valley of Montana Territory. The Walkers were particularly interested in the Alice Mine, one of the camp's richest silver producers. Daly was thirty-five; he had left Ireland in 1856 when he was fifteen, made his way to San Francisco and then to the silver mines of the Comstock Lode in Nevada, where he made the acquaintance of some of Nevada's most solvent investors, including George Hearst. Daly liked the Alice Mine and he advised the Walker brothers to join a large sum of their money to a little of his and buy it. The brothers took Daly's advice, took him in as a partner, and made him the manager of their new jointly held Alice Mine. It performed spectacularly: more than any other single mine, the success of the

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[1] For an in-depth description of the historical method, see Marc Bloch, *The Historian's Craft: Reflections on the Nature and Uses of History and the Techniques and Methods of Those Who Write It* trans. Peter Putnam (New York: Vintage, 1953); John Lewis Gaddis, *The Landscape of History: How Historians Map the Past* (New York: Oxford University Press, 2002).

Alice jumpstarted the Butte boom. Investing in western hard rock mines was a high risk enterprise. The production figures from the Alice proved that Butte mines were worth investors' money.[2]

Soon another of Butte's silver mines caught Daly's eye. The Anaconda Mine, then owned by Mike Hickey and Charles Larabie, was one of hundreds of the camp's randomly scattered quartz claims. No shafts were being dug and no ore was being removed. The Anaconda was a claim, not a mine. Daly, however, liked it, and in 1880 he sold his share of the Alice for $100,000 and bought the Anaconda for $30,000. Marcus Daly had his mine, but he had no miners, no mills, no smelters—and not enough money to get them. Daly approached George Hearst, James Ben Ali Haggin, and Lloyd Tevis, three of San Francisco's most active and most successful investors, and the Anaconda syndicate was born. Daly sold the Anaconda Mine to the syndicate for the $30,000 he had paid for it.[3]

By June of 1880, Daly had crews sinking shafts and hoisting quantities of silver-bearing ore, and other crews milling the ore at the nearby Dexter Mill, which the syndicate leased from W. A. Clark. The Anaconda Mine was everything the four had hoped it would be: rich in silver ores, efficiently run, conservatively

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[2] For Daly's life, see Michael Malone, *The Battle for Butte: Mining and Politics on the Northern Frontier* (Seattle: University of Washington Press, paperback edition, 2006), p. 20; David Emmons, *The Butte Irish: Class and Ethnicity in an American Mining Town, 1875-1925* (Urbana: University of Illinois Press, 1989), pp. 19-21.

[3] Malone, *ibid*. pp. 27-31; Isaac Marcosson, *Anaconda*, (New York: Dodd, Mead & Co., 1957), pp. 32-40.

financed, and, until 1893 at least, blessed with ample and growing silver markets.[4]

What came next began one of the great stories in the history of American hard-rock mining. In May of 1882, miners on the 300-foot level of the Anaconda reported that they had encountered veins of copper sulfide rock that appeared to hold some promise. That got Daly's attention and he joined crews underground to investigate for himself. After the dust from a blast had cleared, Daly reached down and picked up a rather large hunk of pure chalcocite—glimmering copper glance. Daly, it was said, turned to his crew boss, Michael Carroll, and told him simply, "Mike, we've got it!" Indeed they had. "It was . . . one of the great moments in the history of world mining. Daly had just found the largest deposit of copper sulphide that the world had ever seen." Daly's next move was to buy two mines, the Neversweat and the St. Lawrence, adjacent to the Anaconda, and, he hoped and believed, as richly provided with copper as the Anaconda itself.[5]

Daly was right about all three of the mines of the Anaconda group. At almost every level, his crews found evidence of incredibly rich copper sulfide ore bodies. The average copper content of the ore was 45%. Between 1882 and 1884, the Anaconda syndicate sent 37,000 tons of their high grade copper rock to Swansea, Wales for processing. The ore was sent to Wales because no facility in the United States could mill, concentrate, roast, smelt, convert, and refine even a small percentage of the ores from the Anaconda group. There were copper reduction facilities in Butte, but none even approaching the capacity and sophisti-

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[4] Malone, *ibid*., pp. 26-33, 37, 41-45.

[5] *Ibid*., p. 28.

cated technologies that could handle what figured to be an underground copper bonanza.[6]

Daly had already persuaded three of America's most savvy investors to jump into his Montana silver mining adventure—at a cost of several millions of their dollars. He returned to them again, this time to ask them to join him in financing one of the largest, most ambitious—and most audacious—projects in the history of industrializing America. Daly proposed that the syndicate build a reduction facility large enough to handle the ores of the Anaconda group, and of any other Butte copper producer who might be interested in the service. Daly was proposing a processing facility that could handle all the feed ores that Butte could provide. It would be by far the largest such operation in the world.[7]

The reduction facility would be faced with the formidable challenge of separating the copper from the sulphurous rock, or "sulfurets," in which it was embedded. The smelting of sulfurets, including copper sulfide ores, produced smoke filled with sulfur compounds, but this would not have influenced Daly's plans.[8] Neither would have the water-born tailings that issued from the concentrators that were used to separate the ore from the gangue or waste rock before the roasting and smelting operations were begun. We

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[6] *Ibid*.; Arthur Wells, *Report of the Anaconda Smelter Smoke Commission Covering the Period from May 1, 1911 to October 1, 1920,* p. 2. UAM000176086. Patrick Morris, *Anaconda: Copper Smelting Boomtown on the Western Frontier* (Bethesda: Swann Publishing, 1997), p. 27.

[7] Malone, *ibid*., pp. 27-28.

[8] James Fell, *Ores to Metals: The Rocky Mountain Smelting Industry* (Lincoln: University of Nebraska Press, 1979), pp. 30, 49-51.

now think of those wastes, if not properly managed, as damaging to the environment. At the time, they were simply regarded as the unavoidable consequences of removing copper from copper sulfide ores.

Building a new smelter was going to cost a lot of money and be a big financial risk. According to some reports, the four partners spent more than $4 million on the plant before a single load of feed ore had been delivered to its concentrators or a single one of its roasting or blast furnaces had been fired up.[9] As before, the partners did not incorporate and seek outside capital. The risks would be entirely theirs, as would be the control of the operations—and the profits. As it happened, copper consumption in the U.S. tripled between 1880 and 1890, so those profits were considerable.

In 1886, Butte produced 58 million pounds of copper; the next year that total was up to 79 million pounds, which put Montana—meaning a couple of small hills in Butte—first in the nation, ahead of the entire Keweenaw Peninsula in Michigan. Indeed, Butte's production was 43% of the national. In 1890, the company concentrated more than 1,400 tons of ore per day, almost triple its capacity from 1884. In 1894, Montana accounted for 52% of US production of mined copper at 183 million pounds; Michigan was second at 115 million. More than half of Butte's copper, 96 million pounds, was being smelted at Anaconda. By 1898, Montana production was up to 237 million pounds.

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[9] In 1867, two federal mining engineers had written that there "'was reason to believe that the proper economic conditions for smelting do not exist' in the Rocky Mountains." Fell, *Ores to Metals*, p. 45, quoting J. Ross Browne and James Taylor, *Reports upon the Mineral Resources of the U.S.* (U.S. Treasury Department, GPO, 1867). On Haggin, see Malone, *Battle for Butte,* p. 29.

"The whole U.S. was literally electrified with copper from the Butte mines" and the Anaconda Smelter.[10]

1. Siting the Smelter

The next step was to find a suitable location for reduction works that could handle ore in the quantities and with the qualities that Butte was producing. Butte's copper ores were both rich and vast. There were ore processing facilities in Butte, but they could not handle the sheer volume of ore that the Anaconda could produce.[11] In size and technological sophistication, the new Anaconda smelter would set a new industrial standard. Finding a suitable location for it demanded Daly's full attention.

Geology determined where mines, miners, and mining towns would be located. Locating smelters was different. They did not have to be adjacent to the mines whose ores they would process, but they did have to be reachable at a reasonable cost. Sending 37,000 tons of Butte copper ores to Swansea could be done profitably only if the ores were incredibly rich, and even the "richest hill on earth" did not have an unlimited

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[10] Fredrick Quivik, "Smoke and Tailings: An Environmental History of Copper Smelting Technologies in Montana, 1880-1930," (unpublished Ph.D. dissertation, History and Sociology of Science, University of Pennsylvania, 1998), pp. 4-5, 127, 155-164, 170, 195, 253, quote from pp. 4-5; see also Timothy J. LeCain, *Mass Destruction: The Men and Giant Mines That Wired America and Scarred the Planet* (New Brunswick: Rutgers University Press, 2009), pp. 28-29; Edwin Dobb, "Pennies from Hell: In Montana, the Bill for America's Copper Comes Due," *Harper's Magazine*, vol. 293 (October 1996), pp. 39-54. Quivik, LeCain, and Dobb are all highly critical of the Anaconda Company. Each, however, acknowledges the importance of what it did.

[11] Malone, *Battle for Butte,* pp. 31, 33, 41; Marcosson, *Anaconda,* pp.136-193.

supply of ore testing 45% copper. Carrying ores to Corrine, Utah for rail shipment to Colorado's smelters for processing was scarcely an improvement over sending them to Wales. Rail service had recently reached Butte, but railroads could not make smelters of sufficient size suddenly appear. There were no navigable rivers anywhere in the western part of the territory; getting Butte ores to Fort Benton for shipment on Missouri steamers was easier than getting them to Corrine for shipment by rail, but there were no smelters accessible by Missouri steam ships and no great likelihood that there ever would be. In sum, Daly needed to find a smelter site as accessible to the syndicate's mines as possible, and this clearly limited his options.[12]

So did other factors, including the need for sufficient land and water. Daly and his partners obviously hoped that their investment would pay off with constantly expanding copper production—and constantly expanding copper markets. But even for the moment, in 1882, it was obvious to all that a reduction works capable of handling 500 tons of rock per day would occupy a lot of ground. More important than acreage, Daly's works would need water, far more water than Butte could possibly provide. So, the syndicate's smelter would not be in Butte. Daly's was going to have to look for a townsite as well as a place to put his smelter.[13]

Daly's search for a smelter site was "an extensive investigation." It would lead Daly eventually to the upper, that is, southern end of the Deer Lodge Valley after other possible sites had been carefully evaluated. Butte is tucked into a narrow corner of the Continental

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[12] Malone, *ibid.*, p. 30.

[13] Morris, *Anaconda: Copper Smelting Boomtown*, p. 27.

Divide. Daly considered placing his smelter on the eastern side of the divide, but decided that it made more sense to find the water he needed on the Butte side. The Deer Lodge River (now the Clark Fork), or one of its tributaries (including the distant Blackfoot River), seemed ideal as a site for both the new smelter and the new town.[14]

Daly finally found what he was looking for along Warm Springs Creek, a source stream of the Clark Fork, far upstream from the Blackfoot. The site was perfect: it had all the water the smelter would ever need; was less than 30 downhill miles from Butte and on the same side of the Continental Divide; and, as an important bonus, limestone rock and vast timber resources were close at hand. The relative openness of the area was also an advantage. There were mountains to the south and west, but at a distance. To the east and north, the valley was both unenclosed and vast.[15]

2. Siting the Town

Daly filed a mill site mining claim with the United States government on June 22, 1883—Daly called it the Anaconda Mill site No. 1. Five acres in size, it was situated on Warm Springs Creek about 3/4 mile downstream from where he would place the town. His stated purpose for the site was "the erection of a suitable works for the dressing and treatment of ores from the Anaconda and other mines in the vicinity of Butte City, Montana Territory." Three days later, on

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[14] Wells, *Report of Smoke Commission*, p. 3.

[15] *Ibid.,* pp. 2-3. On timber, see Morris, *Anaconda: Copper Smelting Boomtown*, pp. 31-32, 40. The reference to the "broad and open Deer Lodge Valley" is from Quivik, "Smoke and Tailings," p. 49; see also Malone, *Battle for Butte*, p. 30.

June 25, 1883, Daly filed his city plat and named the town after the mine. Within days of the founding of the city and the platting of its streets, men from Anaconda were busy digging a ditch to bring water from Warm Springs Creek to the smelter site of what came to be called the Upper Old Works.[16]

Daly wanted his town to be a place where working-class families could flourish, not just survive.[17] The historian Laurie Mercier puts it this way: "Daly had ambitious plans for his city as well as the smelter. He invested in grand public buildings and services not ordinarily found in other gritty, industrial communities." Michael Malone wrote similarly: "Within a few months" of its founding, "the town had 500 residents, and its handsome rows of brick and frame businesses and homes gave it an ordered and prosperous appearance. . . . Anaconda did not look like the typically grimy 'company town.' And in a literal sense, it was not really a company town at all; for independent merchants and realtors were numerous there from the start."[18]

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[16] Matt J. Kelley, *Anaconda, Montana's Copper City* (Anaconda: Soroptomist Club, 1983), pp. 10-12; see also Morris, *Anaconda: Copper Smelting Boomtown,* p. 29.

[17] Morris, *ibid.,* 33, and Laurie Mercier, *Anaconda: Labor, Community, and Culture in Montana's Smelter City* (Urbana: University of Illinois Press, 2001), pp. 10-11. On the differences between Butte and Anaconda, see William Pape, "The Anaconda's Own Town," in *The Anaconda Company As Seen in Montana: A Series of Articles.* (Waterbury, CT: The Waterbury Republican, 1922), p. 13.

[18] Mercier, *Anaconda: Labor, Community, and Culture*, pp. 10-11, 30; Malone, *Battle for Butte*, p. 30; Morris, *Anaconda: Copper Smelting Boomtown*, pp. 33-35, quote from p. 33; Robert Vine, *Anaconda Memories, 1883*-1983 (Butte: Artcraft Printers, 1983), p. 10. Marcosson, *Anaconda*, p. 51; Deer Lodge County History Group, *In the Shadow of Mt. Haggin: The Story of Anaconda and*

Daly and the syndicate wanted to make the town livable and the smelter profitable. The Anaconda Company, by whatever name, and both before and after incorporation, provided the city's water and sewer systems; it installed lighting; paved the streets; and set up the street car lines. It donated land for churches and schools; built boardinghouses for single workers; built and maintained a large commons used for everything from band concerts to baseball games to ice skating. This common area was in addition to the larger Washoe Park which the company gave to the city for recreational activities. William Pape, a contemporary journalist, added to the list: the company built a fish hatchery, the cemetery, and a "menagerie containing 20 deer, several elk, coyotes, and bears." As late as 1940, almost sixty years after its founding, The Anaconda Company "spent close to $100,000 on more than 75 community projects, associations, and activities. Most of the funds supported upkeep of city parks, the sports stadium, and the annual Christmas tree lighting." In 1950, the company opened a new employees' club with eight bowling allies, pool and card tables, and other recreational equipment.[19]

Daly's choice to locate the smelter in the southern end of the Deer Lodge Valley was a business decision, and an eminently rational one. Mining and processing hard rocks were what southwestern Montana, on both sides of the Continental Divide, was known for; it was what the people of that part of the territory did for a living—what they had been doing for a living for the last thirty years. Smelting ores near where the smelter

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Deer Lodge County from 1863-1978 (Anaconda: privately printed, 1975), pp. 1-9.

[19] Mercier, *ibid*., pp. 3, 57, 140-41; Pape, *ibid*., pp. 13-14.

workers lived was a common and established practice, appropriate in every way to the time and place. Putting a smelter in the upper Deer Lodge Valley, even ones as large as the first two built by the syndicate, even the immense third one built by The Anaconda Company after its incorporation, was a normal and acceptable thing to be doing.[20]

The Warm Springs Valley was not a blank slate, but its fundamental economic and social character was as yet undetermined before Daly located his smelter there. In Deer Lodge County in 1880, there were 136 widely scattered farms. The syndicate, however, was mindful of the effects its operations would have on its immediate neighbors. Daly only needed ten acres for his smelter, but the company bought 3,000 acres of farmland in order to "avoid future annoyance from claims . . . of fume blighted crops." The company also needed to own some ground along Warm Springs Creek where it could put the tailings from its concentrator. It bought all the ground along the creek for eight to ten miles so that its operations would "not injure farmers below."

Daly and his partners were not building the smelter adjacent to an existing city; they were building a new city adjacent to the smelter. That city, together with nearby Butte, would provide ready markets for the products of the farms and ranches that shared, or would come to share, the valley with it. To that generation of western Americans, having the pastoral and the industrial happily dependent on one another was the

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[20] For the extent of mining and smelting in southwestern Montana, see, among many sources, Michael Malone and Richard Roeder, *Montana: A History of Two Centuries* (Seattle: University of Washington Press, 2003 edition), pp. 64-92, 172-200.

way societies were supposed to organize themselves. It was both appropriate and sensible for Marcus Daly to put Anaconda, Montana where he did and to ask it to play host to his company's smelter, which was the impetus for its development.[21]

B. The First Two Smelters, 1891-1902

When the first Anaconda smelter opened in 1884, two things were clear even then. First, Butte's vaunted "richest hill on earth" was going to discharge most of its riches in the form of copper sulfides, not silver or gold. The second point derived from the first: copper, unlike silver and gold, was at best a "semi-precious" or "useful" metal; it could be mined profitably only if the ore was counted in tons, not ounces. It was going to require thousands of men to dig those tons of rock, and it was going to require a processing facility of staggering size and complexity to reduce those tons and convert them into a useable product. This was a risky proposition. Expanding copper production in the Butte mines—building both a town and a smelter on the basis of *projected* ore discoveries—must rank as one of the most venturesome wagers in the history of American industrial capitalism.[22]

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[21] Deer Lodge County in 1880 covered the entire valley. *Tenth Census of the U.S.,* 1880 vol. 3, "Agriculture," p. 70. In 1910, ACM prepared a written statement explaining and defending its record on smoke abatement. In it, the company insisted that the Deer Lodge Valley was not very good agricultural land and that the smelter was the economic life blood of the entire region. Hereafter cited as ACM, "Bliss Trial Document." UAM00111886-899. For the company's "preemptive" purchase of the ground that would likely be affected by its operations, see Gordon Bakken, "Montana, Anaconda, and the Price of Pollution," *The Historian*, v. 69 (Spring 2007): 36-48.

[22] Malone, *Battle for Butte,* pp. 32-40.

The Upper Old Works cost the partners $4 million to build. Between 1884 and 1886, operating expenses for the smelter alone exceeded $3 million, for a plant with one concentrator, a hand roaster, two reverberatory furnaces, and a capacity of 500 tons of ore per day. The Upper Old Works had almost twice the capacity of all of Butte's smelters combined. "At a stroke, the largest concentrator in the United States was located in the Territory of Montana."[23]

The *Mining and Scientific Press* referred to the Upper Old Works as a "wonder." Even more wondrous, however, was that within three years of its going on line, it was unable to keep up with the mines that fed it ore. In 1887, the Anaconda Mine alone produced 50 million pounds of copper ore, overwhelming the syndicate's "downstream" operations. Daly increased the smelter's work force from 1,200 to 1,700, and then doubled its capacity from 500 to 1,000 tons per day. Even that could not handle the production of the Butte mines. As a result, in 1888, the partners began construction on a second smelter. This one came to be known as the Lower Old Works. It did not replace the Upper Works but rather was joined to it. The combined facilities gave the syndicate a 3,000—later 4,000—ton per day capacity which, given that by 1890 Montana was producing 50% of all the copper mined in the United States, was itself barely adequate.[24]

The completion of the Lower Works marked the beginning of a period of extraordinary growth for Anaconda, both the company and the town. Since the

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[23] Quivik, "Smoke and Tailings," pp. 158, 159, 171; see also Morris, *Anaconda: Copper Smelting Boomtown*, pp. 38-39; Marcosson, *Anaconda*, p. 58.

[24] Morris, *ibid.*, p. 39; Malone, *Battle for Butte*, pp. 39-41.

Lower Works were more distant from the town, the company built a new community to house the smelter men and their families. Daly called it Carroll, after Mike Carroll the mine foreman to whom Daly had shouted "Mike, we've got it." But the company did more than build houses and schools. In 1889, Daly built his own railroad, the ambitiously named Butte, Anaconda, and Pacific ("BAP"). The BAP would run 26 miles from Butte's mines to Anaconda's smelters, carrying literally millions of tons of rock, returning to Butte with everything from visitors and newspapers to agricultural produce and dynamite. In 1890, the company instituted a new process, which discharged air into molten copper in converters, was applied to the Anaconda smelter, increasing production and lowering costs. The next year, 1891, the syndicate built a refinery at Anaconda to treat the copper matte from its array of roasting and smelting furnaces.[25]

C. The Washoe Smelter, 1902-1980

By any reckoning, the Anaconda syndicate, from its founding in 1882 through the rest of the 1880s, had had a remarkable run. It had built a city, concentrators with a capacity that had grown from 400 tons a day to 4,000, a refinery, two huge smelting facilities, a railroad and railroad yards; all of this in addition to expanding its Butte mines that its giant operation in Anaconda could be kept well supplied with ores. By 1891, The Anaconda Company had become too large and complex for four men to finance and manage, and formally incorporated as The Anaconda Mining Company, with a capital stock of $12.5 million.[26]

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[25] Morris, *ibid.*, p. 42; Malone, *ibid.*, pp. 28, 53.

[26] Malone, *ibid.*, p. 41; Marcosson, *Anaconda*, pp. 57.

Hearst died only weeks after incorporation; Tevis died in 1899; Daly in 1900.

The $12.5 million was put to good use. Daly continued to deepen the company's mines, and they continued to give up bounteous quantities of ore for the company's reduction works. As the historian Pat Morris put it, Daly's aim had always been "to build the largest and most modern reduction works in the world." To that end, he "always employed the most advanced methods and machinery, . . . recruited the most talented and experienced professionals for his staff, and encouraged experimentation and innovation in all phases of production." In 1892, a full installation of convertors was installed to treat the copper matte coming out of the roasters and smelting furnaces, meaning that from that point forward only metallic blister copper, more than 98% pure, was shipped from Anaconda for further refining. From 1893 to 1895, the refinery installed by the syndicate in 1891 was enlarged. During those same years, a system that used electrolysis to refine copper was added to the smelter. Production went up; cost went down.[27]

In 1895, the corporation underwent reorganization, emerging as the Anaconda Copper Mining Company ("ACM"), a name it would hold until 1955 when it was renamed simply The Anaconda Company. In the mid-1890s, Anaconda was, as Mike Malone put it, "one of the great American corporations—independent, beautifully integrated, conservatively capitalized, and astutely managed." By 1897, if not earlier, Daly was investigating the possibility of further expanding ACM's Anaconda

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[27] Morris, *Anaconda: Copper Smelting Boomtown*, pp. 178, 182-83; Wells, *Report of Smoke Commission*, p. 3. Malone, *Battle for Butte*, p. 42; Marcosson, *Anaconda*, p. 146.

reduction works, and in 1898, plans were underway to replace the Old Works, both Upper and Lower, with a new, much larger and more technically sophisticated smelter, which Daly would name after the Washoe, one of George Hearst's prized Nevada mines.[28]

Daly and his plant manager, Frank Klepetko, were determined that the Washoe would be a state-of-the-art facility. The site chosen for the Washoe smelter was three miles across the valley from Old Works and on the other, or south, side of Warm Springs Creek. By late 1898, the water supply system for the Washoe, along with new switching yards for the BAP railroad, were under construction. The Old Works were not dismantled. Rather, Daly had them remodeled in 1899 and 1900 so that engineers could test new technologies and equipment for later installation at the Washoe. ACM converted the concentrator and demolished 20-foot-long reverberatory furnaces at the Upper Works, replacing them with furnaces that were 29 feet long, and increasing the smelting capacity of the Upper Works by 50 percent. The company also installed two experimental MacDougall roasting furnaces to supplement those furnaces already in use. In June of 1900, two more MacDougalls were in place. The Lower Works was also upgraded. Four MacDougalls were installed and the reverberatories were lengthened.

ACM began closing the Upper Works down during the fall of 1901, a little less than a year after Marcus Daly died. The Lower Works, the second of Daly's great smelters, continued operating at half capacity through the end of 1901. On the 25th of January, 1902, the Washoe went fully on line. The Old Works were

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[28] Malone, *ibid*., p. 46; Marcosson, *ibid.,* p. 38.

closed, soon to be torn down, and the houses in the small town of Carroll were moved to Anaconda.[29]

The Washoe smelter was a colossus, by far the largest ore processing facility in the world. It cost $10.7 million dollars, not including the costs of the new switching yards and track for the BAP. In current dollars, ACM paid somewhere in the neighborhood of $257 million to make copper. When it opened, the roasting department had 48 MacDougall roasting furnaces "of the Evans-Klepetko type." In 1905, the roaster building was enlarged and 16 more MacDougalls were installed bringing the total to 64. The MacDougalls were "the industrial standard"—and Anaconda had not only met the industry standard, it had set it.[30]

In addition to the MacDougalls, the Washoe was outfitted with five blast furnaces, fourteen reverberatory furnaces, and eight converter stands. All of these were fed by a concentrator with a daily capacity of 4,800 tons, soon increased to 8,000, and then to 12,000 tons; more than twenty times the capacity of Daly's first Old Works. The entire facility was just under a square mile in size.[31]

When the Washoe first began operation, each of its five furnace departments—roasting, reverberatory, blast, converter, and boiler—had its own flue and stack system. The eight concentrators employed gravity

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[29] Morris, *Anaconda: Copper Smelting Boomtown,* p. 181; Quivik, "Smoke and Tailings," pp. 275-77; Wells, *Report of Smoke Commission*, p. 3.

[30] Quivik, "Smoke and Tailings," pp. 244, 247, 251.

[31] Anaconda Copper Mining Company to Ligon Johnson, Department of Justice, January 7, 1909, hereafter cited as ACM to Johnson. 06.01.04.00/0247; Quivik, "Smoke and Tailings," pp. 274-285.

concentration; together they had a capacity of 8,000 tons. ACM dealt with the tailings by constructing six slime ponds, along with a ditch to carry slime pond water to the Clark Fork River. Eventually, four dams were built to impound even more tailings.[32]

Every piece of modern concentrating, roasting, smelting, and converting equipment known to metallurgy was housed within the Washoe. In Morris's words, the Washoe was a "showcase of the most up-to-date technology in the world. Line after line of 50 ton ore cars dumped ore into bins that fed a series of large crushing mills which reduced the rocks to dust. From there conveyor belts carried the pulverized stone through the concentration plant; passed through screens, filters, and classifiers then was mixed with water and chemicals . . . ." These concentrates then went "to roasting furnaces where fluxing materials, limestone or silica were added and its sulfur was fumed out. The resulting calcine, a hot powdery white copper dust that flowed like water, was then" moved in special railroad cars to "massive reverberatory furnaces and heated to a molten state where impurities in the form of slag were" removed. "The enriched copper matte was then run into thirteen-ton ladles" and moved by overhead cranes to the "converter building where rows of pot-shaped, oxygen charged, flame belching furnaces took the molten matte and melted out remaining impurities to produce a 98% pure product called blister copper. The blister was then electrolytically refined and molded into large slabs [or] 'anodes', each weighing 465 pounds. . . . The Washoe plant was the marvel of the mining world . . . ." It was "state-of-the art

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[32] ACM to Johnson; Quivik, "Smoke and Tailings," pp. 198, 278-79; Wells, *Report of Smoke Commission,* pp. 2, 5-6.

[and] . . . professionals from around the world" came to observe and study its operation.[33]

II. ANACONDA IN COURT: HISTORICAL LAWSUITS OVER SMELTER EMISSIONS IN THE DEER LODGE VALLEY

A. Early Lawsuits

Beginning in 1898 and continuing until 1924, various parties living in the rough vicinity of Butte and Anaconda started to complain that their property was being damaged by the operation of copper and other metals processing facilities. All of these complaints were about the loss of or damage to property, the economic value of that loss or damage, the recovery of that lost value in damage payments, and the prevention of future damage by court-mandated changes in the way smelters disposed of their wastes.

The Washoe smelter was named in complaints made by Peter Valiton, who farmed three miles south of the city of Deer Lodge, and Charles Williams, who owned a farm six miles north of Deer Lodge, both far downstream from the tailings outflow from Anaconda. In 1898, both claimed that their irrigation water was destroying their grasses and crops. However, neither man brought a lawsuit against The Anaconda Company. Hugh Magone did. Magone's ranch was on the Clark Fork River, miles downstream from the smelters in both Butte and Anaconda. In 1903, Magone asked both for damages in the amount of $20,000 and for an injunction against the further operation of Butte and Anaconda concentrators and smelters.[34]

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[33] Morris, *Anaconda: Copper Smelting Boomtown,* pp. 180-81.

[34] Quivik, "Smoke and Tailings," pp. 296-304.

The Magone case went to trial in 1905. Master of Chancery Oliver T. Crane was appointed by U.S. District Court Judge William Hunt to hear testimony; and he heard a lot of it as metallurgists, soil scientists, chemists, and other experts testified. In March of 1906, Crane issued his findings of fact which confirmed Magone's claims that tailings from the defendants' concentrators had made their way to Magone's land and damaged his property. An injunction against further operation of the smelters, however, seemed a disproportionate remedy and one hardly in the public interest. Crane recommended against it and Hunt, balancing the economic costs of an injunction against the economic damages done Magone, concurred. The smelters would not be enjoined, but they were ordered to pay $1,700 in damages.[35]

The next round of farmer/rancher complaints of property damaged by the operations of the Washoe smelter were far different in focus and consequence. These challenges had considerably higher stakes: The Anaconda Company would become the defendant in two major lawsuits, the second brought by the Federal Government. Both suits demanded that the Washoe smelter be enjoined from further operation. As had been true since the 1890s, and as would be true for the next 30 years at least, closing Anaconda would have nearly bankrupted the state. As Theodore Roosevelt counseled regarding the proposed Federal suit, the government must proceed slowly and carefully when the stakes are as high as these. No suit of this size and

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[35] On the balancing doctrine, see *ibid.*, p. 8; see also the interesting account by the son of one of the ACM's officers most involved in the court cases, Interview with Henry Gardiner, November 10, 1987, OH 641, Montana Historical Society, Helena, hereafter cited as Gardiner Interview.

importance should be entered into by the Government until it had fully and carefully thought out "what the consequences will be." After all, the government might win, in which case Butte and Anaconda would be ruined and "half the State of Montana [would] suffer seriously."[36]

B. Bliss v. The Anaconda Copper Mining Company

Soon after the opening of the Washoe Smelter, Deer Lodge Valley ranchers and farmers began to complain that smoke from the Washoe's five stacks contained amounts of arsenic, sulfur, and other chemicals sufficient to injure and kill their livestock. The state veterinarian determined that the livestock deaths were from arsenical poisoning, and that the source of the arsenic was the smoke from the Washoe's stacks. The company conducted investigations and, in its own words, it "became convinced that there was some foundation for [the farmers'] complaints . . . ."[37]

The company's response was immediate. First, it paid out between $330,000 and $365,000 to the farmers and ranchers whose property had been injured by smelter fumes. No lawsuit had been filed and the company was not required as part of a settlement to make these payments. Neither was it required to take

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[36] Theodore Roosevelt to Attorney General Charles Bonaparte, December 9, 1908. Q0012872-73.

[37] Just before or just after the suit was filed, ACM issued a kind of "press release" to inform interested parties of what the suit was about and what would happen if ACM lost. The document is undated and no name is attached as author. It is, in other words, a document that must be used carefully and only as a statement of the company's position, hereafter cited as ACM, "Bliss Trial Document," p. 1. UAM000111886.

its second action. ACM, in the words of A.E. Wells, a government expert in metallurgy directly involved in the federal suit, "in order to prevent as far as possible any further damage and any further claims for damage," investigated new methods to control "noxious dust and fumes." Anaconda wanted them "caught and retained at the plant." To that end, "early in the spring of 1903, the company told the farmers that it was going "to build [a new] flue and stack system and not to operate the plant without it after July 1903." The stack remodel was not completed until September 13, 1903, with "the plant shutting down completely between July 1 and that date."[38]

The five stacks served by five separate flues were removed, replaced by a single 300-foot stack sited high on the hill south of the smelter. As Wells explained it, the high stack allowed the "fumes and gases . . . [to be] widely disseminated and diluted before coming in contact with the vegetation, and soil in the valley." The stack was "connected with the smelting plant . . . by a double system of flues running from the base toward the smelting plant for a distance of about 1,000 feet, and then by a single flue for a distance of 1,300 feet, to the end of which . . . were connected the separate flues to the several smelting departments." The company also built an experimental plant to recover some of the commercially valuable arsenic trioxide in its smelter smoke. The Washoe Smelter had cost $10 million to build; the remodeling of its stack system, less than a year after it had opened for business, cost $1 million more. The company believed that it had paid for the impacts of its operations and that its "largest, finest equipped and most modern smelting plant in the

[38] Wells, *Report of Smoke Commission*, pp. 7-8.

world" had "completely eradicated" the source of those impacts.[39] The Washoe reopened in September of 1903.

But in the fall of 1904, farmers were again reporting livestock and crop losses and assigning the blame to smoke coming out of the Washoe's new 300-foot stack. In February of 1905, 107 farmers organized themselves as the Deer Lodge Valley Farmers' Association and told Anaconda that their members were willing to sell their property to ACM and settle all damage claims for $1,175,000. ACM would find itself the owner of over 60,000 acres of farmland, most but not all of it in Deer Lodge County. Those 60,000 acres constituted the boundaries of the "smoke zone," the area allegedly damaged by smoke from the Washoe Smelter for which ACM was responsible. That worked out to about $20.00 an acre, or almost $10,000 a farm, not far off 1910 values. Sixty thousand acres also constituted 86 percent of the farm acreage of the county in 1910, which was a far larger piece of farmland than the copper company was interested in owning.[40] The farmers presented their settlement offer sometime in the late fall of 1904; they gave Anaconda until May 1 to accept it or be sued.

The company did not respond to the offer and so, on May 4, 1905, Fred Bliss, a resident of Idaho with property near Anaconda, filed suit in federal court on behalf of the Association. The suit demanded, in addition to damages, that Anaconda be enjoined from operating its smelter.

Early in the trial, Robert Clinton, the lawyer for the Association, told the court that the farmers had redrawn the smoke zone claiming it extended over 100

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[39] Wells, *ibid.*, pp. 5-8; ACM, "Bliss Trial Document," p. 5.

[40] U.S. Census, "Supplement for Montana," 1910, pp. 614-15.

square miles, included 50,000 more acres of improved farmland, and was worth more than $2 million. They offered to settle their damage claims for that amount; almost double what they had been willing to sell the land for just a few weeks prior to filing their suit. Cornelius "Con" Kelley, arguing the case for Anaconda, replied that a smoke zone of 100,000 square miles was a considerable exaggeration; the $2 million price tag no less so. The value of the affected lands, he said, was at most $500,000—suggesting that ACM was willing to settle for that amount.[41]

As in the Magone case, though in far greater numbers, experts were marshaled on both sides of the Bliss case. The trial went on for four long years and generated over 30,000 pages of testimony. It ended with Judge William Hunt, the same judge who had decided the Magone case, ruling that some of the "expert" testimony for the farmers had made a case for some arsenical damage to Bliss's livestock, but that "expert" testimony for Anaconda interests made an equally solid case that the damage was significantly less and the "smoke zone" far less widespread than what the farmers had claimed, that much of what damage had occurred was not owing to smoke but was

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[41] ACM, "Bliss Trial Document," p. 5; Donald MacMillan, *Smoke Wars: Anaconda Copper, Montana Air Pollution, and the Courts, 1890-1920* (Helena: Montana Historical Society Press, 2000), pp. 132-35; *Fred Bliss v. The Washoe Copper Company and the Anaconda Copper Mining Company,* Transcript of Record on Appeal, Ninth Circuit Court of the U.S., pp. 1, 7, hereafter cited as *Bliss* Case. Gordon Bakken, "Was There Arsenic in the Air?: Anaconda versus the Farmers of Deer Lodge Valley," *Montana: The Magazine of Western History*, vol. 41, No. 3 (Summer 1991), pp. 30-41; Quivik, "The Tragic Career of Dr. D.E. Salmon," *Montana: The Magazine of Western History*, vol. 57, No. 1 (*Spring 2007), pp. 32-47.

self-inflicted, and that many of those complaining of smoke damage had simply decided that "farming smoke" was easier than taking care of their livestock. Hunt then ordered that Bliss be paid $350.00 in "special damages."[42]

As for the injunction, Hunt ruled, as he had earlier, that closing the smelter would essentially close the state of Montana, and that would be an unbalanced and disproportionate penalty. The son of one of the company's witnesses, recalling it years later, described Hunt's decision this way:

> [The] Local judge . . . said . . . I'm going to do what is known as balance the equities . . . [I]f I shut it down, I am going to . . . close Butte, close Anaconda, Great Falls, Bonner, other areas and I'll put thousands of men out of work. . . I do find there has been some damage done . . . but not anything to the extent that was alleged. So I'm going to continue this course, going to continue the jurisdiction and [ACM] is to report to me annually as to what they're doing to minimize the damage that they are doing.[43]

As A.E. Wells put it, Hunt retained "the cause" in order to take further testimony as to whether the plant "was then being operated according to the best practical methods. . . . [T]he court reserved the right to call upon the company at any time to produce proof that it was keeping up to the best possible and recognized practice in the art with respect to preventing and minimizing the discharge of deleterious substance into

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[42] MacMillan, *ibid.*, p. 159.

[43] Gardiner Interview.

the atmosphere."[44] There is nothing in the record to indicate that the company objected to or intended to obstruct this process. The "cause" of the farmers of the Deer Lodge Valley had not been abandoned. Neither, however, had it been sustained. Damage claims were denied and there would be no injunction. Thus, the farmers appealed Hunt's decision. In 1911, their appeal to the U.S. Circuit Court was denied. Two years later, in 1913, the U.S. Supreme Court declined to hear a further appeal.[45]

The final decision in the Bliss case, indeed the entire case from filing to conclusion, is one of the most interesting chapters in the long and history of The Anaconda Company. Hunt's decision was based on evidence compiled and reported on by a Master of Chancery, in this instance, O.T. Crane, the same master who had been involved in the Magone case. It is, in many ways, a remarkable legal opinion. First, his reliance on the "balancing doctrine" has been misinterpreted to mean he devised a way to sacrifice the environment to greater corporate profits. The environment, however, was never the issue; property damage and the profits of Deer Lodge Valley farmers were. Hunt did not have to state explicitly that profits were the issue on both sides of the Bliss case; all involved—including those who were only watching the action—knew that.[46] Hunt had only to ask whether

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[44] Wells, *Report of Smoke Commission*, p. 9; see also "Report of the Anaconda Copper Mining Company for the Year Ending Dec. 31, 1908," n.p. Bates #UAR000299229; MacMillan, *Smoke Wars,* pp. 121-124.

[45] MacMillan, *ibid*.

[46] For profits as dominant consideration, see Indenture, February 16, 1912, between Arthur P. Lindsay and ACM. Bates #0013268.

it was fair and logical to close down an operation that produced almost 20% of the nation's copper and accounted for more than one-third of the state's population and income in order to satisfy the property damage claims of 107 local farmers and ranchers.[47] Since those 107 had not proven that the smelter had, in fact, caused damages even remotely approaching their claims, this was not a particularly difficult verdict to reach.

Hunt also dealt with the issue of first, prior, and privileged use. He acknowledged that there were farms in the affected smoke zone before Daly's first smelter was built. But he also pointed out that Daly's smelter, and the Butte mines that fed it, were directly responsible for a vast multiplication of the "farms in the vicinity," most of which were "dependent" on ACM operations as surely as the miners and smeltermen who worked for the company. Implied by his argument was that the agricultural interests of the area fully knew that they were in a smoke zone and that there were costs associated with that. It was instructive that Anaconda had built its first smelter in 1883 "without objection on the part of anyone." Hunt even noted that "prior to 1902 there never was any complaint . . . that . . . any damage [was] being done," something the company had also found curious.[48] There was in this comment at least a hint that the farmers, prior to the filing of their suit, had not negotiated in good faith,

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[47] Circuit Court, District of Montana, Bliss vs. ACM, et al., January 25, 1909, p. 342, hereafter cited as "Bliss Decision."

[48] *Avant* Courier (Bozeman), citing from *The New Northwest* (Deer Lodge), n.d. 1883. Bates #UAM000152349; "Bliss Decision," p. 350.

had presented the company with constantly shifting targets, and were, in fact, "farming smoke."[49]

As for the company, it had built the smelter in an entirely appropriate place and "in accordance with the best known methods and processes." Indeed, the "steps taken by [ACM] are *far greater and more extensive* . . . than those taken by any other copper smelter" in the country.[50]

Following the decision, the company accelerated its policy already in place to buy up the lands within what it perceived to be the smoke zone, the area where arsenic and sulfur dioxide emitted from the Washoe's stack had the most effect. And so the company bought lands where it could, and bought easements and secured releases where it could not.[51] It even began to operate some experimental farms, most of them on lands it had purchased to settle damage claims.[52]

C. The Federal Lawsuit and The Smoke Commission

As noted, among the interested parties in the Bliss case was the Federal Government. Testimony of some of the expert witnesses in the Bliss case suggested that the timber behind the Washoe Smelter was being

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[49] "Bliss Decision," pp. 355-58.

[50] *Ibid.*, p. 352 (emphasis added)

[51] Deed from Peter Jessen and wife to ACM, Aug 12, 1920 contains the following language: "The following distribution should be made of the Jessen purchase: Land $4,000; Tailings $6,000; Smoke $6,000." There are over 500 of these agreements in Box 441 folders 3-12 of the Anaconda Company Records, 1876-1974; Collection MC 169. Montana Historical Society, Helena.

[52] Wells, *Report of Smoke Commission*, pp. 8-10. For the experimental farms, see Gardiner Interview; see also Gardiner's contract with ACM, March 7, 1913.

damaged by smelter smoke. The trees in the vicinity of the smelter were the property of the Federal Government and had only recently been added to the system of Forest Reserves which Roosevelt wished to leave as a legacy of his administration.[53]

As early as 1907, scientific experts as well as agents of his Justice Department were in the Anaconda area investigating tree damage from sulfur dioxide. By 1908, a year before Judge Hunt had ruled in Bliss, the U.S. was preparing its own case for an injunction seeking to close the Washoe Smelter. Roosevelt approached filing suit very cautiously. He was fearful that the government might lose, which would have serious consequences for other and later suits against other western smelters; and perhaps even more fearful that it might win and shut down the nation's copper industry. Consequently, he needed to find a way to finesse the issue; to compel the smelters to take aggressive action while still pouring out the copper the nation had to have and preserving the jobs of the majority of Montana's work force.[54]

Roosevelt surrendered his presidency to William Howard Taft in March of 1909, still two and a half months before Hunt issued his verdict in Bliss. That verdict did not deter the Taft administration from continuing to investigate smoke damage in the Anaconda region. Those investigations showed continuing damage to the Federal Government's forest. ACM's position

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[53] MacMillan, *Smoke Wars*, pp. 249-256.

[54] For Theodore Roosevelt and conservation, see Samuel Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement* (Pittsburgh; University of Pittsburgh Press, 1999); Douglas Brinkley, *The Wilderness Warrior: Theodore Roosevelt and the Crusade for America* (New York: Harper, 2010).

was that it had spent millions of dollars and installed the best industrial hardware known to the business; that was all it could do and all it could fairly be asked to do.

On March 16, 1910, the U.S. Attorney for Montana filed a federal suit against Anaconda, charging that the Washoe Smelter's fumes were killing the government's trees.[55] In March of 1911, before trial in the government's action against ACM had begun, Judge Erskine Ross of the 9th Circuit Court of Appeals denied the Deer Lodge Farmers' Association's appeal of Judge Hunt's ruling against an injunction in the Bliss case. Hunt's balancing of the equities was upheld.[56]

Only five weeks later, on April 13, 1911, the government and The Anaconda Company entered into a "Stipulation and Agreement." The Government agreed to suspend its lawsuit, and ACM agreed that it would "at all times use its best efforts to prevent, minimize and ultimately to completely eliminate the emission . . . of all deleterious fumes . . . particularly those containing sulphur dioxide." The stipulation also called for the formation of a three member "board of experts," comprised of a representative of the government and ACM, and a third to be chosen by both. Later known as the Smoke Commission, the Board of Experts was to "certify" the changes in "methods, improvements, devices or processes" that would produce the stipulated results. It was then to report directly to the Attorney General on how well ACM had responded to and acted upon their "certifications." "So long as the said defendant (ACM) shall well and truly comply with

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[55] *USA V. Anaconda Copper Mining Company and Washoe Copper Co.*, District of Montana, Complaint, UAM 000105262.

[56] *Bliss v. Washoe Copper Co.*, 186 F. 789 (9th Cir. 1911).

the terms of this stipulation, no further proceedings shall be taken in this suit." But, "in case of a breach of the terms of this agreement," the Attorney General could reopen the 1910 suit.[57]

The first three Commissioners were John J. Hammond, Louis Ricketts, and J.A. Holmes, three esteemed scientists and mining engineers. The Anaconda Smelter Smoke Commission would report annually beginning in 1911-12 and continuing through the decade of the 1920s. The members and their staffs would spend considerable time at the smelter, watching the ores that came in and the copper—and smoke and tailings—that left. But note carefully the years when the Smoke Commissions was discharging its scientific and legal responsibilities. The Great War began in August of 1914. The U.S. would not become a co-belligerent until April of 1917, but a war involving all of Europe and, with or without American participation as a combatant, would have a profound effect on the Smoke Commission; on the Department of Justice and its suspended suit against ACM; and on the Anaconda Copper Mining Company, the world's largest producer of what the U.S. government had identified as among the most important of the materials of war.

In 1916, President Woodrow Wilson created a War Industries Board (the "WIB") which required America's copper companies to produce as much copper as they possibly could. In 1918, the Smoke Commission reported to the Department of Justice, which then reported to the War Industries Board. The chair of the Commission and the Attorney General agreed that A.E. Wells,

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[57] *Agreement and Stipulation between U.S. Government and ACM,* 1911, UAM00010382; see also Wells, *Report of Smoke Commission*, pp. 10-13, 16.

who was "in charge of the sulphuric-acid investigations," would act "in cooperation with the War Industries Board."[58]

During the entire decade and more of Commission oversight, before and during the war, the reports to the Attorney General complimented Anaconda for the company's cooperation with their study of its smoke.[59] The charge to the Smoke Commission was simple enough: find technological fixes to reduce or eliminate both arsenic and sulfur dioxide. A complete and impressive array of scientists—chemists, metallurgists, various and sundry engineers, agronomists—some working for ACM, some for the Commission, investigated every nook and cranny of ACM's waste disposal systems. Upon their recommendations, the company essentially remade the Washoe. A brief description of the new facilities, the new industrial and technological hardware, and the new departments is sufficient for an understanding of how the company responded to the Board's "certified recommendations."

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[58] U.S. Bureau of Mines, *Report, 1918* (Washington D.C.: Government Printing Office, 1919), p. 27, UAM000207286.

[59] Wells, *Report of Smoke Commission*, ACM "cooperated most heartily and cordially . . . ," pp. 26. For the Board of Experts and Washoe as its laboratory, see Letter from Chairman, Board of Experts to Attorney General, December 13, 1912, UAM000100535; Manning to Hammond, Ricketts and Cottrell, November 29, 1920, UAM000226210; and Smoke Commission, "Report," March 1, 1924, UAM000004341. John Hays Hammond, a member of the Commission for its entire history and one of the world's most distinguished mining engineers, wrote that, "The Anaconda Company has placed at the disposal of the Board not only all of its records, but it has authorized its employees in charge of the Smelter operations to carry out whatever tests . . . the Board should request. . . ." *The Autobiography of John Hays Hammond*, vol. 2 (New York: Farrar and Rinehart, 1935), pp. 562-563.

Arthur Wells, the Bureau of Mines chemist and metallurgist on loan to the Commission, pointed out in 1922 that "the period between 1913 and 1916 was one of very rapid change and improvement in the whole copper smelting industry and this was nowhere more in evidence than at Anaconda."[60] He was right about that, but he might have extended the chronological reach of his argument. The years of the Smoke Commission, 1911 to 1924, were the busiest in the extraordinarily busy history of the ACM and the Washoe Smelter. Consider the additions and changes to the way the Washoe did business that were made during these years, most at the behest and always with the knowledge and implied approval of the Board of Experts. I offer this list in no particular order of importance or even chronology, but merely to provide some examples:

1. Started a department of Agriculture complete with model farms.[61]
2. Tore down the 300-foot stack and built a 585-foot stack.
3. Surrounded that stack with 20 Cottrell electrostatic precipitators, or treaters, which it continued to fine tune for the next five years.[62]

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[60] Wells, *Report of Smoke Commission*, p. 47.

[61] Gardiner Interview.

[62] Wells, *Report of Smoke Commission*, p. 48; Matheson wrote to Cottrell in 1911 that Ross decision meant there was no "necessity" of doing more. However we're still interested in your process." Bakken, "Price of Pollution," p. 44.

4. Built an entirely new flue system to serve its new stack and treaters. (Total cost of numbers 2 through 4 was approximately $2.4 million.)[63]

5. Built an arsenic recovery plant and began to manufacture arsenic trioxide.[64] (Closed in 1965.)[65]

6. Built a plant to produce sulfuric acid from sulfur dioxide. (Cost: over $1 million.)[66]

7. Built plant to treat phosphate rock in 1919-1920.

8. Built plant to use phosphate rock and sulfuric acid to make treble superphosphate fertilizers in 1919-1920 and expanded plant in 1922-1923. (Dismantled in 1961.)[67]

9. Built the Warm Springs and Opportunity settling ponds to capture tailings from both the Washoe Smelter and the previously closed smelters in Butte. (2,000 acres of ponds; cost: $800,000.)[68]

10. Changed from gravity concentration to flotation concentration, increasing the recovery of marketable copper from 78% to 91%. Increased

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[63] Board of Experts to ACM, May 13, 1916, UAM000254889.

[64] Wells, *Report of Smoke Commission*, p. 48.

[65] Anaconda Reduction Dept., typescript report, n.d. ca. 1975, UCI000010246.

[66] Wells, *Report of Smoke Commission*, pp. 97-101.

[67] *Ibid.*, pp. 102-03; Anaconda Reduction Department, typescript report.

[68] Board of Experts, "Report of Progress of the Anaconda Smelter Commission," July 1, 1918-July 1, 1919, p. 2, PRC00004228.

concentrator capacity to 15,000 tons/day. (Cost: $4 million.)[69]

11. Enhanced smelting capabilities by adding new furnaces and enlarging existing ones.
12. Continued policy of buying up lands in the Deer Lodge Valley, as well as securing smoke and tailings easements and releases.
13. Founded the model town of Opportunity, selling home sites to smelter workers who settled the town.
14. Constructed a special reverberatory furnace for smelting metals collected in the Cottrell treaters.[70]
15. Began negotiations with the U.S. Forest Service to settle the 1910 lawsuit by trading lands.

This would have been a remarkable record at any time in Anaconda's (or any other company's) history, but consider the circumstances: strikes by Butte miners in 1917, 1918, 1919, and 1920, and a strike of smelter workers in Anaconda in 1917; the serious labor shortage occasioned by the war—as an example, for the first time, women were hired as smelter workers, not just as clericals; price controls on copper; and the nationalization of the nation's rail system, including the Butte Anaconda and Pacific. In addition, and more importantly, most of these changes came with the War Industries Board demanding maximum production on the one hand and the Justice Department demanding minimal smoke on the other. Production of copper

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[69] Wells, *Report of Smoke Commission*, p. 35.

[70] *Ibid.,* pp. 65-74. See also Board of Experts, "Report of the Anaconda Smelter Commission," May 1, 1924.

during the war years was nearly 25 million pounds per month, as compared to normal production of 13 million to 18 million pounds. ACM faced, as A.E. Wells put it, the "necessity of maintaining the maximum possible output of copper to meet war requirements."[71]

John Hays Hammond, who served on the Commission during all of its active years, said the company freely admitted there was a problem, then conducted "remedial experiments" costing "hundreds of thousands of dollars in a sincere endeavor to solve" it.[72] ACM was prepared to deal in good faith and with diligence in meeting its obligations under the 1911 Stipulation and Agreement—and those imposed by war and the mobilization of American industry that accompanied it.

D. How the Lawsuits Ended

As noted, before the Old Works even went on line, Marcus Daly and the syndicate bought the property downwind and downstream of the smoke and tailings they knew would be the by-products of their operations. They did not buy that land because that was cheaper and easier than installing equipment that would prevent smoke and tailings. They did it because there was no equipment that could prevent smoke and tailings. As the son of one of its officers put it, The Anaconda Company "made a basic decision, that as long as they were going to have to comply and we're always in the possibility of some rancher suing them again, the more ranch area that they owned the better off, because they are paying all the taxes in Deer Lodge County anyway."[73]

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[71] Wells, *ibid.*, pp. 113-114.

[72] Hammond, *Autobiography*, p. 562.

[73] Gardiner Interview.

There were simply no technological fixes to the problem of the smoke and tailings. Not one of the plaintiffs, or of the many experts called by them, offered any solution to the problem, which clearly troubled Judge Hunt.[74] The Board of Experts came no closer to finding an even partial solution. Sulfur and arsenic were as embedded in Butte ores as the copper itself.

Given technological limits and the nature of Butte ores, full protection to those neighbors was simply not possible. And so ACM continued, as it had since 1883, to deal with lawsuits, actual and threatened. There were a variety of means; all of them cost money. It could and did pay to settle damage claims. It could and did buy entire ranches and farms where damage had been alleged.[75] It could and did reserve and secure smoke and tailings easements.[76] It could and did buy releases from those whose property had been or might be damaged by its emissions, by the terms of which the party suffering the damage would "release, acquit and forever discharge [ACM and the Washoe Company] . . . and each of their predecessors, successors and assigns from any and all liabilities, damages or claim for damage . . . on account of any smoke, gases or fumes . . . or

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[74] *Bliss Decision*, p. 353.

[75] ACM, "Lands for Reduction Works, Tailings, Ditches, etc.," January 1, 1913-December 31, 1936, UCI000007537.

[76] See for three examples among many, "Indenture between Luke Talbot . . . Bert Talbot and Janet Talbot . . . [and Amalgamated], December 8, 1903, UAM0000029996; "Indenture between Harry Griffith and the Anaconda Copper Mining Company . . . the Washoe Copper Company . . . September 3, 1904, UAM000002993; "Indenture between Mary Barnard, Lee Barnard, May Henderson and C.S. Henderson, Albert Moog and Ella Moog, and Mary M. Savory and the Anaconda Copper Mining Company, Washoe Copper Company . . . September 25, 1909, UAM000002970.

on account of any tailings, slime, debris or other refuse matters . . . ."[77] One of those whose land was bought was Fred Bliss. One of those from whom a release was bought was Walter C. Staton, the officer of the Deer Lodge Farmers Association whose frequent letters to President Theodore Roosevelt complaining bitterly of the effects of ACM emissions were part of the run-up to the 1910 federal suit.[78] Literally hundreds of these releases were recorded.

Thus did ACM end its legal fight with the farmers of the valley. It concluded its legal war with Federal Government in a similar way. In the case involving the trees owned by the U.S. Government, the parties entered into protracted negotiations. Anaconda owned vast amounts of productive timber lands in western Montana. It agreed to trade those lands for Forest Service timber lands that its smelter had injured.

The exchange formula was simple: the smoke zones were in the form of concentric circles around the Washoe stack. Damage in the innermost circle was greatest, with diminishing injury as one moved toward the outer rings. Foresters would determine the size of the smoke zones, and then appraise what the area would have been worth had there been no damage. They, along with ACM foresters, would then find, appraise, and offer up undamaged forest lands of a

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[77] "Deed James R. Perdee to ACM Company, Land in Deer Lodge County, Montana, also Smoke and Tailings Release," May 8, 1916.

[78] For Bliss, see Gardiner Interview. For Staton, "Indenture between Walter C. Staton and Margaret Staton and the Anaconda Copper Mining Company, Washoe Copper Company, October n.d., 1911. For Staton's leadership in the Association, see MacMillan, *Smoke Wars*, pp. 123, 126, 136-143. MacMillan, quite uncritically, accepts Staton's letters as unbiased and truthful.

value equal to the lands in the smoke zone prior to their being damaged. The foresters were elated. The areas most damaged by smelter fumes had not been particularly rich in forest resources to begin with; the areas they were getting in exchange contained marketable timber, the value of which could be counted, and counted upon. As one forester put it, "[I]n exchange for an area which without smelter injury could never have been highly productive, we are securing a larger area of more highly productive lands." Another one noted, "An appreciably greater volume of marketable-sized timber is being acquired by the Government than is being passed to the ownership of the company."[79]

On March 24, 1933, after five block exchanges had been completed, the Federal Government's lawsuit against Anaconda was dismissed.[80]

E. The Model Town of Opportunity

There were two methods a company might use to deal with the alleged property damage from its smoke and tailings: 1) it could work to alleviate future damage by installing equipment that reduced smoke and tailings; and 2) it could compensate for past damage by giving company property, either money or land, to the injured parties. ACM employed both methods. It spent millions of dollars on new technologies hoping to mitigate future damages, and paid hundreds of thousands of dollars to settle claims. A Justice Department official who had been involved in the federal suit wrote in 1924 that the company had "secured 'smoke rights' on

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[79] U.S.F.S., "Public Relations Policy for the A.C.M. Exchange, 1928," UAM000139735; W.R. Gregg to Secretary of State, September 27, 1934, UAM000171565.

[80] Civil Docket, Silver Bow County, U.S. District Court, U.S. v ACM, 1910, UAM000105790.

practically all of the farms in the Deer Lodge Valley."[81] His reference was to easements and releases. The company also purchased outright a great deal of land in the Deer Lodge Valley following the Bliss and U.S. lawsuits.

What to do with the land acquired by ACM was the responsibility of Dr. H.C. Gardiner, a veterinarian from Bozeman. Gardiner had diverse responsibilities. During the Bliss trial, he had hired and worked with the scientists investigating the extent of livestock injury in the Deer Lodge Valley. But he was also in charge of the investigations into crop and timber injury, was closely associated with Samuel Fortier in the development of both the Warm Springs Ponds and the new irrigation projects for reclaiming and farming Deer Lodge Valley lands, and was intimately familiar with everything the Smoke Commission was doing and with what his company was doing to comply with the Commission's recommendations. In sum, H.C. Gardiner knew something about everything that was going on with smoke and tailings and with the efforts to reduce both.[82]

As early as 1910, just after the Federal Government's lawsuit had been filed, Gardiner was exploring the idea of building a model town where some of The

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[81] Ligon Johnson to the Forester, March 4, 1924, UAM000004341.

[82] For owning and leasing lands, see Board of Experts, "Report, 1924." Gardiner was made superintendent "of our Farm Department." Was also made superintendent of "land classification of the 'cut-over' timber lands of the ACM Co. Salary of $500.00/ month. Would supervise "all the farming operations of the ACMCo in DLCo . . . . Also supervision of Unit No. One, DLCo., and any other units that may afterwards [be] undertaken, along the lines suggested by you and Dr. Fortier." Contract with ACM, March 7, 1913. Anaconda Company Records.

Anaconda Company's smelter workers and their families could live. He had himself bought the land once owned by Fred Bliss. On it Gardiner ran a small and successful ranching operation—the Willow Glen Stock Farm.[83]

From the very beginning of the commissioners' work, there was confidence that the arsenic problem could be solved.[84] That confidence was not misplaced; the one great triumph of the Smoke Commission was in the area of arsenic recovery. In April and May of 1917, for example, the Commission conducted eighteen tests on the recovery of dust, copper, and arsenic for the treaters on the #2 roaster flue. Two of the tests indicated an arsenic recovery of 99.6 percent; copper recovery was as high as 99.7 percent; lead as high as 98.7 percent. The eighteen test average for dust was 91.9 percent, 97.2 percent for copper, and for arsenic, 94.8 percent. Those numbers were never reached on all twenty of the treaters, but after some fine tuning in 1919-20, Arthur Wells reported that "the total amount of material recovered by the treaters has been between 60 and 100 tons per day, this catchment being from 50 to 85 % of the total amount of material going to the treaters in the furnace gases." "Generally speaking the treaters have been recovering more than 85% of the copper, and 70 % of the lead and arsenic . . . ." That was thought enough "to safeguard the agricultural interests in the vicinity." Making "the situation safe for stock raising" was going to require "close

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[83] Gardiner Interview.

[84] *Ibid.* See also ACM, "Lands for Reduction Works . . . 1913-1936," UCI000007537.

cooperation" between the Commission and the company, but it too seemed to be within reach.[85]

The Commissioners never recommended that ACM build a model city; they never even mentioned it in any of their reports. But in context, the model city that Gardiner proposed and developed—what he would call Opportunity, and where he would raise his own family—was as much a result of the Commission's work as was the big stack. Corporate and governmental sponsorship and financing of model cites like Opportunity was a common feature of progressive reform in most of the industrialized nations of the world. Like everything else on the progressive's agenda, new cities could not be left to just happen; they had to be planned, ideally by experts. The streets would be laid out and named according to plan; churches, schools, and parks would be placed for maximum efficiency of access and use. There would be no tenements in these new planned communities; no boarding houses filled with single men; no (or few) saloons. In other words, the old industrial worlds of male-dominated ethnic enclaves that more nearly resembled warring ethnic battle stations would give way to ethnically and gender mixed communities, with schools, churches, and community halls in place of ethnic fraternal halls and saloons. That was the progressives dream in Britain, Germany, and the eastern United States. It was H.C. Gardiner's dream for Opportunity.[86]

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[85] Wells, *Report of Smoke Commission*, pp. 57, 68-71.

[86] For the movement for "rural reconstruction" and model cities as part of it, see Daniel Rodgers, *Atlantic Crossings: Social Politics in a Progressive Age* (Cambridge: Harvard University Press, 1998), pp. 318-366, *passim*. The advertisement for Opportunity ran in the *Butte Daily Post,* June 11, 1914.

Throughout the summer of 1910, Gardiner met with and sought the opinions of a variety of Montanans experienced in various phases of agriculture, from appraising land values to crop selection. These meetings took place immediately after the Federal Government had filed its lawsuit against the company for which Gardiner worked and in defense of whose interests he had testified in the Bliss case. Gardiner asked J.H. Scanland who lived and farmed just downstream from the smelter about the value of Deer Lodge Valley bench lands. Scanland told him that, once drained, they were worth up to $100.00 an acre and would soon be worth ten times that.[87] He asked J.E. Morse of Dillon, Montana what he thought about a model town for smelter workers. Morse told him that it was a grand idea—and for reasons having nothing to do with the value of the lands. Morse felt "certain that if you get the emplyes (*sic*) of the Smelter of Anaconda interested in making homes on these tracts, that you will get a much better class of people, beside having every thing settled about the smoke question, and remove any prejudices that may exist among people in another part of the State against the ACM Co."[88]

This last was a recurring theme. "In view of the bitter fight that is being made by those who claim to have suffered damage by reason of alleged smoke injury, and because of the effort that is being made by the same people to discredit the Anaconda Co. all over the state, I believe some such plan is desirable, both from the standpoint of economy and future safety." Such a community "would do much to nullify the

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[87] Dr. J.H. Scanland, Montana State Hospital, Warm Springs to H.C. Gardiner, ACM, April 16, 1911, UAR000353421-22.

[88] J.E. Morse, Dillon, Montana to Gardiner, June 2, 1911, UAH000353423.

efforts of the muckrakers who are just now making strenuous and somewhat successful efforts to discredit the company with the people."[89] "I can see no reason why you cannot build up a prosperous community in a few years and the object lesson would certainly have great weight in case another smoke suit is contemplated. I can see no reason why the venture should not also be a financial success for your company."[90]

But better public relations were not the only advantage. One of Gardiner's correspondents told him that the number of smelter workers who would move to Opportunity and "adopt this semi-rural home life, will steadily increase . . . until in a comparatively short time nearly the entire working force of the smelter would be living on these productive plats of land." This would greatly benefit ACM as well. The company would have "a better class of employees;" the "loyalty and efficiency" of its work force would be improved; it would attract men who were more "reliable" than the "floating class of people" it then employed. They would be "more contented and much less liable to engage in labor disturbances." During shut downs—for whatever reason—this new-breed of smelter worker would "employ his time in cultivating . . . instead of becoming a temporary loafer."[91] Another of those Gardiner consulted mentioned that markets for the produce from the gardens of Opportunity were close at hand "and it will be possible for many of the men to find remunerative work in the smelter at the same time as they are

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[89] Fred Whiteside to Gardiner, Feb 3, 1911, UAR000353430.

[90] T.T. Black to Gardiner, Feb 9, 1911, UAR000353432.

[91] Fred Whiteside to Gardiner, February 3, 1911, UAR000353424; Paris Gibson to Gardiner, April 20, 1911.

looking after their little farms, with their family doing most of the work."[92]

In October of 1913, the Deer Lodge Valley Farms Company was formed.[93] The Farms Company met at ACM headquarters—the sixth floor of the Hennessey Building in Butte. It was chaired by Cornelius Kelley, soon to be ACM's president, and its other officers, including H.C. Gardiner, were also part of the company's management team. ACM always owned most of the Farms Company's stock; in 1915, it increased the total number of shares, buying all but 5 of those issued. In 1935, with the full approval of the Deer Lodge Valley Farms Company's board of directors, ACM bought the remaining shares of the Deer Lodge Valley Farms Company, dissolving the company. Under whatever name and whichever owner, from the beginning the Farms Company and the town of Opportunity, which the Farms Company sponsored, was an ACM operation.[94]

On May 30, 1914, the *Engineering and Mining Journal* ran a story on the Deer Lodge Valley Farms

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[92] Alfred Atkinson, Prof of Agronomy, Bozeman, to Gardiner, April 20, 1911, UAROOO353427. See also R. W. Thatcher, Director of State College of Washington Agricultural Experiment Station to Gardiner, March 17, 1911.

[93] Articles of Incorporation and Minutes of meetings of the Deer Lodge Valley Farms, Inc., 1913-1915, UAR000176483.

[94] See ACM, Statement of Investments in Subsidiary Companies, n.d. ca. 1920, UAR000251332; Deer Lodge Valley Farms Company, "Minutes of Special Meeting of Stockholders," December 23, 1935, UAR000511628; Announcement of Special Meeting of Farms Company stockholders and assignment of proxies, December, 1935, UAR000512203; J.R. Hobbins, ACM, to W.C. Rae, January 18, 1936, UCI000044239; Memorandum from J. Eyde to J.J. O'Brien, June 25, 1980, UAR000263819.

Company, "to which [ACM] has deeded its 5,180 acres of agricultural lands situated between Butte and Anaconda." The land was transferred for a "nominal consideration of $112,300 . . . to be sold to actual settlers on easy terms." Much of the land was swampy and would have to be drained, and, like most of the land in the Deer Lodge Valley, irrigation water would have to be provided. Gardiner and the Mill Creek Irrigation Company were ready to bring the water to the lands they had drained. They needed only to find the farmers/smeltermen to do the farming.[95]

Two weeks after the *EMJ* story, on June 11, 1914, the *Butte Daily Post* carried a half-page advertisement complete with a plat map for the "Deer Lodge Valley Farms Co. Lands" at "OPPORTUNITY, Montana." "The Anaconda Copper Mining Company" was in large letters on both the map and the advertisement. The townsite was triangular in shape, with 88 building sites of various sizes up to ten acres. It was bordered by Mill Creek on the north, the old Montana Union Railroad tracks on the southwest, and Willow Creek on the southeast; Brundy Creek ran down the middle of town. The Clark Fork River was less than a quarter mile from the town's eastern edge. Its east to west running streets were named after Montana's state governors; its north to south avenues after Territorial governors. Thirty years after the Anaconda syndicate first stoked and fired the furnaces of the Old Works, the corporation that succeeded it was building a new

[95] The *Engineering and Mining Journal* also reported that the company had "transferred its timber lands in Ravalli, Sanders, Missoula and Powell Counties to a new corporation known as Blackfoot Land Development Co. At a nominal price of $2 per acre. This land is also to be sold to actual settlers on easy terms." See also County History Group, *Under the* Shadow, p. 25.

rural community that blended agriculture with industry. No one buying land from the Deer Lodge Valley Farms Company could have been unaware that the smelter came first and made Opportunity possible.

The advertisement accompanying the map described a community taken straight out of a progressive city planner's play book. Much like the town of Anaconda, Opportunity was designed to be the antithesis of a western mining "camp;" a place that was clean, tidy, morally upright, and *permanent*. It was never incorporated; the town of Anaconda was close enough and the feeling of permanence did not require mayors and city councils. It required schools, churches, and a community hall, which were provided by ACM. It was developed:

> [T]o provide homes where the people of Anaconda can enjoy the benefits of country life, while sharing in the activities of the industries located here. It affords a real solution for the high cost of livng (sic) Little farms, with cows, pigs and chickens; gardens with vegetables, apple trees and small fruits, will supplant the city street and the crowded city lot. . . . The soil . . . is a deep black loam, underlaid with clay and gravel . . . alluvial in character . . . having been originally . . . an old lake bottom, and later a swamp . . . . The land has been tile drained; ten miles of twelve-inch drain lines which run full the year round insure adequate drainage.

The ad did not say it, but the drainage system was built by ACM. So was the irrigation system which was "in process of installation," and which would "provide ample irrigation water."

The lots were sold on a flexible 30-month installment plan; each ten acre tract had "a graded street in front and an alley in the rear. The company built the power poles to bring in electricity. It was put to good use: "With the electrification of the Montana Union railway and an extension of the Anaconda street railway system, car service [would] be established between Opportunity, the smelter and the city." "Opportunity Park, comprising 65 acres has been set apart . . . along Mill creek, as a recreation ground and center for this community." Additional recreation land was reserved along Mill, Brundy, and Willow Creeks. A modern elementary school (Gardiner named it the Beaver Dam School) was to be built in Opportunity Park. High school students had "[trolley] car service to Anaconda." Land owners could build the house of their choice with the contractor or their choosing, though the Farms Company also had construction crews. The lumber department of ACM would "furnish lumber and mill work to the home-builders at mill cost plus . . . freight."[96]

And there would be no speculators; no one buying and holding lots, then selling them at extortionate prices. Not more than one lot was to be sold to any one individual, who then had one year after purchase to finish a "bona fide residence," or return the land to ACM with a full refund of purchase price. As for "the undesirable element[s]," Opportunity would be not just a planned community, it would be a sheltered one. "The establishment of saloons, roadhouses or any business or operation which shall constitute a nuisance is prohibited under the deed and contract."[97] Gardiner's

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[96] For bringing power in, see Letter to C.F. Kelley, November 5, 1914, UAR000391563.

[97] *Butte Daily Post*, June 11, 1914. See also County History Group, *Under the Shadow*, pp. 24-28.

model city was not just unrelentingly progressive, it was taking on a kind of utopian quality: "[I]n the event of the death of the purchaser . . . leaving surviving him a wife or . . . children, . . . *no further payment shall be required under this contract, and the vendor (ACM) will make, execute and deliver a deed . . . to such wife or child, or wife and child or children, of the said purchaser*."[98]

There was another perhaps unique feature to Opportunity: it was located six miles east of the town of Anaconda, directly adjacent to the smelter's tailings ponds, and in the path of west winds carrying the smoke from the smelter. Opportunity was founded at precisely the same time that ACM was buying up as much of the Deer Lodge Valley as it could; and buying easements or releases from liability from those property owners who would not sell their entire properties to the company. Though the sale of land during a land buying spree clearly demonstrated the confidence of Gardiner and Anaconda in the new technologies, they were still mindful of the importance of protecting the company against future lawsuits for property damage arising from its smoke and/or tailings. They dealt with that issue in a predictable way: when ACM transferred its lands to the Farms Company on May 1, 1914, it included the following language in the deed: "There is hereby reserved unto [the Anaconda Copper Mining Company and] its successors. . . an easement and right . . . to pollute the atmosphere . . . by any smoke, fumes, gases, tailings or slimes . . . free from any . . . claim of damage or liability . . . ."[99] When the Farms

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[98] *Butte Daily Post*, June 11, 1914 (emphasis mine)

[99] Conveyance Deed, ACM to Deer Lodge Valley Farms Corporation, May 1, 1914, UAM00014689. See also H.E. Ferguson to W.M. Kirkpatrick, October 7, 1958, UAR000263830.

Company in turn transferred land to a home buyer, The Anaconda Company retained its easement—the "deed of conveyance" was made "subject to all conditions . . . contained in that . . . deed of conveyance of date May 1, 1914 . . . ."[100]

Opportunity teaches important historical lessons, beginning with the most obvious: 30 years after it selected the Deer Lodge Valley as the site for its smelter and town, ACM built a model rural "village" for its employees. Where Opportunity was placed was as important to ACM as what Opportunity was. H.C. Gardiner was as thoroughly familiar with the work of the Smoke Commissioners as any man alive. He believed that they could and would solve the arsenic problem and that the southern end of the Deer Lodge Valley would be made safe for semi-rural living and productive agriculture. The Commissioners, with the full cooperation of The Anaconda Company, had done what experts were supposed to do: they had identified a problem, then planned and executed a solution to it. Their "model" solutions were expected to make Gardiner's model community possible. Should those expectations not be realized, ACM secured guarantees that the citizens of Opportunity would not launch the next round of property damage suits.

By 1917, Deer Lodge Valley Farms had sold 31 building sites in Opportunity; it was also home to an impressive inventory of farm animals: "55 horses, 176 pure bred cattle, 77 hogs, 297 sheep." There was farm machinery with a value of $1,200, and "5 automobiles"

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[100] Conveyance Deed, n.d. form used by Deer Lodge Valley Farms in sale of lands in Opportunity, UAR000263831.

worth $1,050."[101] Beginning in the 1920s, Gardiner brought back some of the experts from the Bliss and government cases to look over the new model community and to see how well it was progressing.

By the mid-1920s, another rural community was formed—or formed itself—just south of Opportunity, on the other side of the Montana Union Railroad right of way and Highway 1. It was called Crackerville, the name given it by one of the Torgerson brothers who by that time were running a bus service from Anaconda to Gregson Hot Springs, and eventually to Butte. In 1928, another enterprising Anacondan, W.A.J. Thompson, decided that Anaconda needed air service. He bought a couple of biplanes, hired two pilots, and converted some open ground six miles east of town into an airport. The location was near the turn off road to Gregson and close to Crackerville. As Patrick Morris writes, "So the field became the Crackerville Airport, . . . headquarters of the . . . Anaconda Air Service."[102] Crackerville was all but indistinguishable from Opportunity; the two grew up together—a couple of semi-rural villages adjacent to the world's largest copper reduction works.

Generations of Anaconda smelter workers would live and raise families in Opportunity and Crackerville. Much has changed in the century since its founding, but much about Opportunity is as it was when Henry

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[101] Letter to H.C. Gardiner, April 12, 1916, UAR000357051; Letter to H.C. Gardiner, February 26, 1916, UAR000357075; "Cashier" to R.D. Cole, ACM, August 24, 1916, UAR000353062; "Statement showing livestock, etc. on Deer Lodge Valley Farms land, 1917," April 11, 1917, UAR000343360; Letter to Charles Swartz, ACM, April 11, 1917, UAR000343357.

[102] Patrick Morris, *Anaconda Montana: In Changing Times* (Bethesda, Md.: Swann Publishing 2010), p. 20.

Gardiner founded and platted it. The town's 800-plus residents (Crackerville included) still live in well-kept houses on straight well-marked streets, bordered by shade trees, now grown to impressive size in the 100 years since some were planted. The lots are still mostly undivided, in part because that's the way the company wanted it; in larger part because that seems to be the way the citizens of Opportunity want it. "Opportunity remains a vital little rural community to this day."[103]

F. Why the Lawsuits Ended

Because of the nature of the present complaint against AR, this history has necessarily emphasized the legal challenges against Anaconda by various property owners for damages allegedly resulting from its concentrating and smelting operations. The company's response to those legal challenges took up a major portion of its history from 1911 to 1933 when the last of the suits against it was resolved. After all of those years of court house battles, "certified recommendations," smoke and tailings easements, major changes in concentrating and smelting technologies, accelerated war-time production, and land purchases and swaps, it is what did *not* happen after 1933 that commands center stage. For the next fifty years, until 1983—three years after the smelter had closed—when the state of Montana filed a CERCLA action against AR (ACM's corporate successor), there were no other significant suits against Anaconda for property damages due to pollution from its smelter.

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[103] For population, see "Domestic Well Sampling Program . . . ," May 1, 2003, p. 1, AROPP00085462 Quivik, "Smoke and Tailings," p. 419.

Those years were distinguished by production rather than by litigation, by profits and losses, good times and bad. The simple arithmetic discussed earlier still applied: the more copper—and zinc and manganese—the company produced, the more smoke and tailings it emitted. In the years after 1933, however, the simple arithmetic was in the background. It was always there, but it occasioned no legal controversy; it occasioned, in fact, very little comment of any sort. As such, for purposes of this report, these post-litigation years do not need extended treatment. Let that discussion begin with a simple question: Where did the fervor to litigate go? Answers may be found by looking at what happened affecting copper smelting operations after the end of the First World War.

The great 585-foot stack and its complement of electrostatic treaters went online until June 15, 1919, six months after the end of the Great War. When the stack was finally finished and electronically treated fumes run through it, it is likely that little smoke, visible or invisible, could be seen by those gathered to watch. The reason was not that the new system was functioning so wonderfully; it was that the smelter was barely functioning at all. The hothouse production of the war years had led to huge stockpiles of unused and unwanted copper; in that sense, the war had ended "too early." The result was a classic, copper-specific inventory recession. In December of 1919, the American Mining Congress complained that "with the signing of the Armistice [in November, 1918] . . . complete stagnation developed in the copper market, and producers were left with an enormous stock of copper."[104] For ACM, 1919 was a year of "profound

[104] *The Mining Congress Journal*, December 1919, UAM000116503.

depression; profound enough that the Washoe was shut down for ten months in 1919-1920. The numbers tell the story: total copper production was down by nearly half; employment figures by more than half. By 1921, the price of copper had fallen to 12.7 cents per pound, down from the fixed wartime price of more than 24 cents, and ACM was laying off workers by the thousands. During the war, ACM had 18,000 on the payroll; by 1921, it had 2,600. The Smoke Commission had little to do during these last years of its active involvement for the simple reason that Anaconda was doing so little—whether it be producing copper or producing smoke.[105]

There was a strong recovery between 1925 and 1929, but in 1929 the entire American economy began to teeter, and by 1930, a nation-wide economic depression drove ACM—and everyone else—to the brink of collapse. ACM continued to swap lands with the Forest Service, one of whose officials commented that smoke damage was directly related to production and that the Great Depression had almost entirely eliminated both. Americans were learning some hard lessons during these years, as were the people of Anaconda and Opportunity. The lessons of the Great War were clear enough. A war oversold as one to end all future wars

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[105] See Department of the Interior, U.S.G.S., Mineral Resources of the United States, 1919, Part I--Metals (Washington, D.C.: Government Printing Office, 1922), pp. 526-535, UAM000200398; John D. Ryan's Comments to Department of Labor Investigation, February 17, 1919, UAM000254529; Frederick Laist to L.V. Bender, January 9, 1919, UAR000729569; Message of Governor Joseph M. Dixon to the 17th Legislative Assembly of the State of Montana, 1921; and, George Hildebrand and Garth L. Mangum, *Capital and Labor in American Copper: 1845-1990* (Cambridge: Harvard University Press, 1992), p. 112, UAM000109413; *Mining and Scientific Press*, July 30, 1921, UAM000222548.

and as one to "make the world safe for democracy" could only be won if copper producers produced copper—and zinc and manganese and whatever else the gargantuan military appetite for metals required of them. Now they were learning the equally hard lesson that jobs in copper mines and smelters required markets for copper.[106]

In 1938, and for the next seven years, those lessons were re-enforced when war replaced depression—as depression had replaced war in 1919. World War II, predictably, created an enormous demand for the materials necessary to fight. In January, 1941, almost a year before the Japanese attack on Pearl Harbor, the U.S. Government formed the Office of Production Management ("OPM") and charged it with working to "increase, accelerate, and regulate [the] production and supply" of items "needed for national defense." Two of those items, copper and zinc, were on Anaconda's list, too, and a third, manganese, was about to be. On January 15, 1942, six weeks after Pearl Harbor, the OPM's managing of production gave way to controlling and dictating production, the task of the new War Productions Board ("WPB"). Before the war was over, the Federal Government controlled 100% of Anaconda's allocation of copper.[107]

The WPB had separate branches for copper, zinc, and manganese/chromite. It also had vastly increased powers of persuasion/coercion. The WPB acknowledged

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[106] See Morris, *Changing Times*, pp. 46-50; Hildebrand and Mangum, *ibid.*, pp. 107-108. Marcosson, *Anaconda*, pp. 220-250.

[107] John Davis Morgan, Jr., *The Domestic Mining Industry of the United States in World War II* (Washington: National Security Resources Board, 1949), pp. 29-32, 138-143, 271-275; ACM, *Annual* Report, 1941, p. 11.

the "essentiality of copper," and gave it an "urgency rating band of III, . . . the highest rating given to plants . . . with the exception of the Manhattan Project."[108] That same year, the War Manpower Stabilization Act was passed and a War Manpower Commission, chaired by Paul McNutt, was put in charge of ensuring that mines and smelters had a labor force large enough and hard-working enough to meet the production quotas set by the WPB. In a "Message to American Workers in Mines, Mills, Refineries, and Smelters of Copper . . . Zinc [and] Manganese," McNutt called ACM, as well as those who worked for it, to their duty: "To defeat the Axis, you must furnish the metal for more ships and planes, more tanks and guns, more bombs and bullets . . . ."[109] That meant a lot of copper: a tank had eight hundred pounds of copper in it; a large bomber had a thousand pounds; a battleship, a thousand tons. Up to a ton of copper was fired out of a 37 mm anti-aircraft gun in twenty minutes; the machine guns of a fifty-plane squadron could fire off seven tons worth of copper per minute. Frederick Laist, by then vice president of all of ACM's Metallurgical Operations, said in a letter to W.E. Mitchell, manager of the Washoe, that the company was receiving considerable criticism in Washington, D.C. because its production levels were not up to 1929 levels. His next comment was more warning than anything else; he told Mitchell that "I cannot be too insistent as to the importance

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[108] Internal WPB memorandum, January 20, 1943, UGH000004115-24; WPB, Inter-Division Meeting of Division Concerned with Mineral Production, November 13, 1942, YGH000012075-78; Letter from F.H. Hayes, Assistant Director, Copper Division, to C.E. Weed, Vice President ACMC, UAM000131661.

[109] Memorandum from Chairman of the WMC, Paul McNutt, to all nonferrous metal workers, UAM000282803-04.

of . . . making all of the copper possible out of the tailings." Laist feared that if ACM did not meet its required production levels, the government would take over its operations. And so it met those levels—and was awarded five Army-Navy "E" flags, a high commendation for "excellence in production."[110]

The U.S. government wanted ACM to make copper and at whatever cost. The Montana Manpower Director for the WMC, for example, told local officers that "[t]he . . . war [will be] . . . won . . . by production of copper. Let *nothing stand in the way*."[111] The *Copper Commando,* the appropriately named joint publication of ACM, the U.S. Government, and the Smeltermen's union, was similarly bellicose:

> When Hirohito pulled his sneak punch at Pearl Harbor . . . he didn't realize that he had locked horns with the construction crews at Anaconda. . . . [T]he boys . . . rolled up their sleeves to tackle the remodeling of the East Mill of the copper concentrator. . . . What should keep Hirohito awake nights is the fact that . . . the East Mill will have a capacity of 2,000 additional tons of copper every twenty-four hours . . . .[112]

ACM operations met its responsibilities. In 1933, ACM produced 70 million pounds of copper. Granted, that was a depression year. In 1943, it produced 275 million pounds, an increase of 400 percent. Those 275 million pounds represented approximately one-third

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[110] Morris, *Changing Times*, pp. 113-14.

[111] Memorandum from O.C. Lamport, State Manpower Director, USES, to all local offices, February 15, 1945, YGH000027469-89.

[112] *Copper Commando*, September 19, 1942, YGH000016628.

of the total supply of primary copper available to the entire country.[113] It also, and at the government's urging, produced a total of 1,784,400,000 pounds of electrolytic zinc and somewhere in the neighborhood of 400,000 tons of manganese oxide between 1942 and 1945.

The production of smoke and tailings went up in lock step—to no one's surprise and no one's concern. In 1946, there were complaints of excessive dust north of the smelter. In a letter to Congressman Mike Mansfield, C.A. Lemmon, assistant manager of the Washoe, explained why there was a problem:

> As you know, during the war period copper was one of the critical metals and most urgently needed for the war effort. All copper producers were urged by the Government to produce the maximum amount their facilities could furnish. Our instructions . . . were to produce every pound of copper possible from whatever source it could be obtained. In compliance . . . we . . . [began] the retreatment of low-grade copper bearing materials, such as old mine dumps, tailings, etc. which had previously been discarded . . . . It is quite obvious that in the processing of these materials of relatively low copper content it would be necessary to handle large volumes . . . .

By "large volumes," Lemmon meant the smelter needed six times more tailings than would have come from the same amount of copper taken from "regular Butte ores." The results were predictable: more smoke

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[113] See U.S. Department of the Interior, Bureau of Mines, Minerals Yearbooks; ACM, Annual Report to Stockholders for 1943, p. 5.

and more tailings. Another result of treating these "secondary materials" was "nearly 65,000 tons of additional copper for the war effort."[114] Mansfield responded that he knew that "copper was of tremendous importance during the war," adding that there were "new operations" to maximize production and that "problems naturally arose" from those operations. By problems, Mansfield meant smoke, fumes, and dust.[115]

At no time did the government ever ask that the company pay any attention to the smoke and tailings that were an unavoidable consequence of this production. As was true in the First World War, so also in World War II: winning wars trumped all else, including pollution concerns. No government agency ever made reference to the 1910 lawsuit, or the 1911 Agreement and Stipulation, or the Smoke Commissioners, or the land exchanges. What should be manifestly clear is that *nothing*, and certainly not smoke or tailings, was going to be allowed to get in the way of the maximum possible production of copper, zinc, and manganese.

Nothing really changed after the war ended in 1945. The Cold War with the Soviet Union and assorted other Communist regimes did not have the felt urgency of World War II, but neither did it allow for dropping one's guard. Preparedness remained the watchword—and metals remained central to being prepared. The Defense Production Act of 1950, and the Defense Minerals Administration (DMA) formed under it, warned that there might have to be "accelerated demands for stra-

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[114] C.A. Lemmon, ACM, to Mike Mansfield, May 28, 1946, UAM00014220.

[115] Mike Mansfield to C.A. Lemmon, June 4, 1946, UAM000014223.

tegic and critical metals . . . . The purpose of the DMA is to assure an adequate supply of metallic . . . minerals for the national defense effort . . . keeping mines, smelters and mills at maximum efficient operation. . . . [W]e must get maximum production possible." For The Anaconda Company, maximum production translated into high profits, high employment, and generally good times for all.[116] In Butte, shaft mining had given way to open pit truck driving; there were miners left, but not mining as Butte had known it. The Washoe was now taking Butte ore that had been hauled out of a hole in the ground in gargantuan trucks; it was also being fed by ores from Anaconda's rich open pit mines in Chuquicamata, Chile and elsewhere. Feed ore, however, was feed ore, and as the DMA put it, the U.S. needed "the maximum production possible—every available pound—from existing facilities immediately."[117]

By 1973, there was growing uncertainty as to whether the Washoe Smelter of The Anaconda Company would remain long among those existing facilities. The primary reason was the nationalization of ACM properties in Chile by the Marxist government of Salvador Allende. Those properties were worth around $1 billion, and The Anaconda Company had no strategy for dealing with losses of that magnitude. The falling price of copper, the 1970s energy crisis, and new, more stringent environmental regulations also played a part. In 1977, AR bought out Anaconda. Just three years later, however, the smelter was shut down. Only

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[116] See Morris, *Changing Times*, p. 124. In the 1960s, the war in Viet Nam gave a boost to ACM production. See also Johnson, *Montana Economic Study,* 1970, p. 2.28.

[117] James Boyd, Administrator of the Defense Minerals Administration, remarks made before the American Mining Congress, December 5, 1950, YAH00009845.

the stack remains—and that after a protest by historically minded local residents.

III. THE SOCIAL AND ECONOMIC ROLE OF THE COMPANY IN MONTANA AND DEER LODGE VALLEY COMMUNITIES

Not even a brief history of The Anaconda Company would be complete without some discussion of what the company meant to the economy and to the social structure of its namesake town and the surrounding region.

The Anaconda Company was, in every meaningful sense, a Montana company. It was started in Montana; it was run by Montanans; its official address might have been 25 Broadway, NYC, but its real headquarters were on the sixth floor of the Hennessey Building in Butte, as all of those Montanans who referred to "the 6th floor" to mean ACM fully knew.[118] It even held its annual shareholders meetings on Main Street in Anaconda.[119]

ACM had an extensive record of promoting "in-house," often choosing men who had begun work at the very bottom of the ACM job hierarchy and moving them up to managerial positions; witness Robert Dwyer, born in Anaconda who began his fifty-three years with the company working in a blacksmith shop, and ended his career as the company's president. Dwyer's ascent was more spectacular than most, but he was only one of many working-class Anacondans who found that ACM had plenty of "careers open to talent." It was, in fact, a long tradition with the company, a part of its corporate culture. Marcus Daly had been a miner; Con

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[118] Pape, "The Anaconda in Politics," p. 48.

[119] See ACM, "Annual Reports," 1935, 1939, 1941, 1944, 1953.

Kelley broke his leg in an underground mine accident where he was working as a nipper, and went on to become Anaconda's head legal counsel and later its president. Add the names of William Scallon, John Ryan, Dan Kelly, and scores more to the list of locals who came to the company early and in relatively humble positions and stayed to run its operations, or at least major components of them. The social and cultural history of Anaconda is inextricably tied to The Anaconda Company; it was the town's company as surely as it was the company's town.

A. The Anaconda Company's Economic Impact

The economic record is indispensable to any complete understanding of the past. What follows is not intended as a sophisticated or nuanced economic analysis; I'm not trained to offer such. I know that historians often misuse economic statistics and that what is statistically significant is not always historically significant. And I'm convinced that economists often misuse history and that what is historically significant is not always statistically significant.[120] Fortunately, the figures that follow practically speak for themselves.

Copper carried the electricity that powered America's economy, and The Anaconda Company produced a prodigious amount of that copper—and of other metals vital to the nation's well-being. The value of those same metals during wartime does not require further discussion. Production figures from various years are noted earlier in this report, but here are some more. In 1950—a good year—The Anaconda Company pro-

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[120] Charles Feinstein, *Making History Count: A Primer in Quantitative Methods for Historians* (Cambridge: Cambridge University Press, 2002), pp. 72, 158, 160.

cessed at its Washoe Smelter 37,500 tons of copper ore *every twenty-four hours*.[121] Here are some statistics on what Anaconda did over the long term. These are Butte ore totals, but most of this rock was most likely handled in Anaconda. In the 120 years from 1880-2000, 22,799,000,000 pounds of copper was taken out of the Butte Hill. That is very nearly 23 *billion* pounds. Of zinc 4,909,202,540 pounds; manganese 3,702,787,341 pounds; lead 854,797,405 pounds; molybdenum 326,671,890 pounds; silver 725,486,448 ounces; gold 2,922,446 ounces.[122]

When the company was operating at full capacity and with full employment, the town of Anaconda and Deer Lodge County did well economically. When the company was struggling and the numbers it employed declined, or when the company closed down and the numbers once employed became unemployed, the town suffered economically. As the company went, so went the town. During its operational lifetime, 1884-1980, the concentrators and smelters in Anaconda were directly responsible for the economic health of the city, the county, and the region.

There were good and obvious reasons for this connectedness of fortunes. Let me begin with some employment figures. In 1906, at the time of the Bliss trial, ACM had 4,548 men employed in the mines; about 2,500 in its "reduction works."[123] Three years

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[121] Atlantic Richfield, Co., "Anaconda Childhood Arsenic Exposure Study, April, 1992, p. 3.

[122] Montana Bureau of Mines and Geology, "Map of Butte Hill" with statistics; Miscellaneous Contribution 19; by Ted Duaime, Patrick Kennelly, and Paul Thale. (Butte: Montana Tech of University of Montana, 2004).

[123] "Bliss Decision," p. 364.

later, as the Federal Government was preparing to sue it, the company reported that 9,380 worked in its Butte mines, another 2,623 men were employed at the Washoe Smelter.[124] Those figures may have been low; the Census Bureau counted 16,587 miners in Montana in 1909, another 4,000 in smelting. Of the miners, 14,251 were working in copper mines, almost all of which by 1909 were owned by ACM.[125] Regardless of which set of numbers one uses, Anaconda's economic impact was huge. Consider that Montana's population in 1910 was 376,053: 39,165 of those lived in Butte, 56,848 in Silver Bow County—the "greater Butte metropolitan area"—10,134 more in Anaconda. In the first six months of 1906, total wages paid to the 7,000 ACM employees was slightly over $5 million. If one assumes that every Anaconda company employee was supporting two other people, ACM's $10 million annual payroll was directly responsible for more than 80% of Anaconda's population, right at half of Silver Bow County's, and indirectly responsible for almost everyone else.[126]

Nothing changed very much over the next nearly 70 years. In 1922, copper was just recovering from the immediate post-war recession. In the second half of 1921, for example, the total work force at the Washoe Smelter was less than 900; it had been almost 5,000 just five years earlier during the Great War. By 1922, it was just under 2,200—this in a town with a total population of 11,668 in 1920. Butte/Silver Bow County

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[124] ACM to Ligon Johnson, January 7, 1909, 06.01.04.00/0247.

[125] Johnson, *Montana Economic Study*, p. 2.14.

[126] U.S. Census Supplement for Montana, 1910, p. 569; ACM, "Bliss Trial Document;" Harold J. Hoflich and Maxine Johnson, *The Economy of Montana* (Missoula: Bureau of Business and Economic Research, Montana State University, 1951), p. 53.

figures would have corresponded with those of the smelter town. The census counted over 18,000 metal miners in Montana in 1920, and it is entirely safe to assume that 12,000 of those were working in Silver Bow County's mines—which is to say, ACM's mines.[127] Assuming an average daily wage of $4.00—also entirely safe—and an average work year of 250 working days, Anaconda company paychecks put about $15 million into the two cities.

In the slightly more recent past, employment figures for ACM's Montana operations reflected, as they always had, the fortunes of the company as a whole. The figures that follow are for the state, but more than 90% of the metal mining and smelting in Montana was being done in Anaconda mines and smelters. In 1939, the workforce in those two related industries was 10,700 with an annual payroll of just under $19 million. By 1943, during the hothouse production of World War II, the job figure was 15,800 with wages of $32.3 million. In 1950, the numbers were 11,800 and $41 million plus.[128] Obviously, these were the salad days for both the company and the towns. Profits, production, employment, and wages were all high and predicted to go higher.

This pattern of growth persisted through the 1950s and 1960s. As it turned out, those years were last relatively good ones the company would know. In 1966, a fairly representative year, 1,368 people worked at the Washoe Smelter, 3,915 in the Butte mines, and 211 more for the Butte, Anaconda, and Pacific Railroad. Wages from the Anaconda Reduction Works were $12.2

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[127] Morris, *Anaconda: Copper Smelting Boomtown*, p. 183; Johnson, *Montana Economic Study*, pp. 2.14-2.15.

[128] Hoflich and Johnson, *Economy of Montana*, pp. 53-54.

million; from the Butte mines, $29 million; from the BAP, $1.88 million. Those numbers hardly changed for the next eight years. In 1974, about 5,200 Anaconda Company workers in Butte and Anaconda drew paychecks in the amount of just under $66 million. The long-term figures, particularly for a sparsely populated state like Montana were especially staggering. From 1912 to 1973, Anaconda company payrolls in Montana amounted to more than 2.5 *billion* dollars. I focus here on the effects of the company on the local economy, but it is worth pointing out that perhaps 75 percent of the workforce of the state drew Anaconda company paychecks.[129]

All of the jobs noted above were with The Anaconda Company—by whatever name. All of the paychecks were drawn on Anaconda Company accounts and entered into the company's books. Direct employment is only part of the story; there are "multipliers" that can help determine the total number of jobs created, directly and indirectly, by one industry. Mining copper ores and reducing them to marketable copper affords an example, a particularly telling one in a place like Butte and Anaconda, of an economy that rested, as one economist put it, "on a very narrow resource base," meaning that copper was essentially the only game in town.[130] Judge Hunt in making his ruling in the Bliss case did not use the word "multiplier" but he used the concept. He pointed out that in 1906 the railroads "in Montana derive[d] their earnings largely from the

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[129] Frank Lanou, "Economic Impact of Anaconda's Copper Operations in Montana," November 19, 1975, pp. 28-29, UAR000253759. Total wages from 1912 to 1973 from Frank Monninger, Anaconda Company, "Anaconda in Montana in the Mid-[illegible]," May 10, 1974, p. 3, UAR000328895.

[130] Lanou, *ibid.*, p.20.

freight handled in connection with (ACM) operations." He was not referring to the Butte, Anaconda and Pacific Railroad, but to the non-Anaconda owned lines that carried goods into and out of the company's two headquarters towns. ACM was a good and dependable customer; it paid freight charges of $1.4 million in 1906, comparable sums in the years before then. Since 1902, Hunt went on to state, ACM had spent over $4 million for coal; over $4 million for coke; over $740,000 for lime rock; over $1.3 million for machinery; and over $53,000 for lumber.[131]

The indirect economic benefits of having an Anaconda Company around were always a part of the Anaconda story. In 1950, the Bureau of Business and Economic Research at Montana State University (now the University of Montana) estimated that "about half the people of Silver Bow County . . . are . . . dependent upon mining in the Butte district and that . . . operations in Anaconda . . . support close to three-fourths of the people in Deer Lodge County."[132] Those numbers had not changed appreciably from those of 1909. They did not change in coming years either. In 1964, the company employed over 9,000 Montanans who earned a total of over $56 million. It paid more than $11 million dollars in freight bills and almost $9 million for electrical power. It also bought more than $42 million worth of "equipment, supplies and services from hundreds of suppliers," many of them Montanans. In sum, "Anaconda's Montana operations" plowed $143.6 million into the Montana economy in 1964 alone.[133]

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[131] "Bliss Decision," p. 364.

[132] Hoflich and Johnson, "Economy of Montana," p. 53.

[133] Anaconda Company, "The Anaconda Company: Partner in Montana's Progress," one page typescript, n.d. 1964, UAR001024123.

In a 1974 speech to the Montana Chamber of Commerce, Frank Monninger, president of the Mining Division, reported: "Mining is one of the primary industries in Montana, and the primary industries are the driving force for the economy. Every job in a primary industry creates 2.4 'derivative' jobs in wholesale and retail trade, the service industries, finance, insurance, real estate, transportation, construction, and state and local government."[134] A year after he offered his remarks, an economist by the name of Frank Lanou completed a detailed analysis of "Anaconda's Copper Operations in Montana." It was Lanou's judgment that for "each [Anaconda company] job . . . there are 2.87 jobs in the economy" of Silver Bow and Deer Lodge Counties, and "for each dollar of earnings" from Anaconda "there are $2.28 of earnings for the economy."[135] The discrepancy arose because Anaconda paid higher wages than those derivative industries that depended upon mining and smelting, a point made by other observers as well.[136] Using his multiplier, Lanou found that almost 15,000 jobs in the two affected counties were "attributable" to the Anaconda; this represented "64.2 percent, almost two-thirds, of the jobs . . . in 1973."[137] Clearly, Lanou concluded, the company plays "a crucial role in employment and income in Silver Bow and Deer Lodge Counties . . . ."[138]

In 1973 and 1974, Anaconda spent millions installing the "pollution free" Arbiter process for reducing copper

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[134] Monninger, "Anaconda in Montana."

[135] Lanou, "Economic Impact," p. 6.

[136] *Ibid.*, pp. 20, 30. For higher than average wages, see also Johnson, *Montana Economic Study*, p. 2.34.

[137] Lanou, *ibid*., p. 30.

[138] *Ibid.*, p. 3.

ores as well as making other improvements in their pollution control systems.[139] In 1977, they sold the entire operation—land, mines, reduction works—and legal liabilities to come—to the Atlantic Richfield Company. In 1980, the smelter was closed; three years later, the mines were closed.

Finally, it is worth noting that AR has continued to make a substantial contribution to Montana's economy throughout the three decades since ceasing operations in Anaconda and Butte by funding numerous environmental clean-up projects throughout the State. This effort began in the early 1980s and continues to the present day.

In 2009, economists from the Montana Department of Natural Resources and Conservation and the Montana Department of Labor and Industry produced a report called "An Estimation of Montana's Restoration Economy," which confirmed that "Federal Superfund activities have brought hundreds of millions of remedial construction dollars and thousands of jobs to Montana's economy."[140] Using data from two recent Superfund projects, the report's authors determined that every million dollars spent on cleanup directly produced 10.97 jobs and indirectly produced 20.56 more. A million dollars, in other words, meant 31.5 new jobs in Montana. Two-thirds of those working on the one project received their paychecks at Butte zip codes; these were jobs whose benefits were felt locally. In

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[139] *Forbes,* December, 1915, pp. 22-34; see also Monninger, "Anaconda in Montana."

[140] Montana Department of Natural Resources and Conservation and the Montana Department of Labor and Industry, "An Estimation of Montana's Restoration Economy," September, 2009, pp. 8-10.

addition to the jobs multiplier, the report also determined that every million dollars spent produced $2.59 million in "total economic activity." It should be noted that these multipliers are not appreciably different from those used by Lanou in 1975—or by ACM in 1910.[141]

I do not purport to endorse the State report's economic methodology or its precise numeric conclusions; but the report and its conclusions are instructive. The economic benefits that such an influx of money brings to southwestern Montana is undeniable.

B. Community Awareness

Perhaps this is a good time to return to the way historians go about their business; what is usually called the historical method. Historians cannot be certain of what—if anything—was in the minds of the people about whom they write. It is the historian's responsibility, as Marc Bloch, one of the greatest of them, put it, "to plumb the consciousness" of those people, to know as much as they can about as much as their historical actors knew.[142] And for good reason, because "in the last analysis it is human consciousness which is the subject-matter of history. The interrelations, confusions, and infections of human consciousness are, for history, reality itself."[143] But this is an elusive reality. The historian can only be certain of what people *could* have known, and, with overwhelming evidence, what they *should* have known, what they were given every opportunity to know. But historians

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[141] *Ibid*.

[142] Marc Bloch, *The Historian's Craft: Reflections on the Nature and Uses of History and the Techniques and Methods of Those Who Write It*, trans. Peter Putnam (New York: Vintage Books, 1953), pp. 140-141.

[143] *Ibid.*, p. 151.

cannot, or should not, presume that all of those people availed themselves of those opportunities. So, while I cannot—and do not—presume to opine what was in any one person's mind, I can opine as to what was generally known in the community from the perspective of a social and cultural historian.

Thus, within those parameters, whether looking up at the flues and smoke stacks on the ridges north of town in the 1880s and 1890s, or in the 20th century, looking at the 300-foot stack placed on-line in 1902, or the giant 585-foot stack finished and in full operation by 1919, people *knew* there was smoke coming out of The Anaconda Company's furnaces. From the flumes and ditches, slimes and tailings ponds, train cars loaded with Butte ores coming in, smaller and fewer rail cars carrying copper anodes out, and a concentrator covering city blocks, people *knew* that there were tailings. They also knew or should have known that some portion of these water and air borne emissions might settle on their properties. These facts were known, not just because they were self-evident, but because the company publicly admitted as much, paid damages where and when it thought them warranted, bought and traded land, negotiated easements and releases of record, and defended itself in courts of law when those who claimed damages sued it. People also knew all of this because the newspapers were filled with stories of how the company proposed to deal with the question of its smoke and tailings. And people knew all of this because people talk to one another, particularly in small communities like those in the Deer Lodge Valley.

In 1983, the lawsuits returned when the State of Montana filed a CERCLA-based natural resource damage suit against the Atlantic Richfield Company.

The State claimed that The Anaconda Company, AR's predecessor in interest, had inflicted great damage on the environment of the Clark Fork River Basin from Butte to Milltown. This lawsuit was about restoration of soil, surface and ground water, fish and birds, insects, and native plants. It was about everything that occupied 120 miles of the Clark Fork River. In 1989, the Federal Government filed a CERCLA suit of its own against AR demanding that it remediate nearly the entire Basin. In 1987, dozens of private citizens also filed suit against AR claiming that "[a]s a result of the operation of the Anaconda Smelter Site and facilities for approximately the last century, large quantities of dangerous and toxic materials and contaminants, including arsenic and cadmium, lead, zinc, copper and other heavy metals have been and continue to be stockpiled and released into the atmosphere, soil and water . . . ."[144] This series of lawsuits and the attendant publicity surrounding them (especially the government suits) demonstrates a significant level of knowledge in the community of the pollution problems from the old smelter.

The point is further made by a survey of the local newspapers. The first newspaper account of the effects of reducing copper ores appeared in 1883, before the Old Works had even opened. From that point through the various legal battles over smoke and tailings, the buying and swapping of lands, the installation of new hardware, the accelerated production of two very hot world wars and various cold ones, the newspapers covered every aspect of Anaconda operations.[145] Nothing

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[144] Anderson Complaint, ¶ 5 (1987).

[145] Both Quivik, "Smoke and Tailings," and MacMillan, *Smoke Wars* cite to numerous newspaper account of Anaconda opera-

changed in the "modern" era. In 1972, the *Anaconda Leader* carried an account of how "Anaconda fights pollution."[146] By 1991, the paper was reporting on the EPA and the meeting it had called with Anaconda residents to talk about "waste removal."[147] By 2000, the lead story was about Deer Lodge County and its application for a grant to study the ground water in Opportunity. In all, between 1972 and 2000 there were 138 articles in either the *Leader* or the *Montana Standard* dealing with pollution from the Washoe Smelter and the effects of and response to that pollution. I have made no effort to count the precise number written after 2000, but a safe estimate would be well over 200.

In addition, there were scores of public meetings. Some of the public meetings were held in the Opportunity Community Center; all were well publicized and well attended by an engaged and vocal citizenry. Henry Gardiner would have been pleased; that is what the community centers of model cities were for—the open discussion of issues of interest to the community. A great number of these meetings were called by the EPA for the purpose of eliciting the most public comment possible on the CERCLA cleanup. The law was specific: "Public participation is required by CERCLA . . . ." It was "required that before adoption of any plan for remedial action . . . by EPA, the State, or an individual (PRP)," *i.e.*, "potential responsible party, in this case AR, "the lead agency shall: 1. Publish a notice

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tions from 1883 to the 1940s. These accounts were especially numerous when ACM was facing legal challenges.

[146] For one example from hundreds, see the *Anaconda Leader*, November 5, 1972.

[147] *Anaconda Leader*, May 22, 1991.

and brief analysis of the Proposed Plan and make such available to the public. 2. Provide a reasonable opportunity for submission of written and oral comments and an opportunity for a public meeting at or near the site regarding the Proposed Plan . . . . The lead agency shall keep a transcript of the meeting and make such . . . available to the public."[148]

The EPA was a busy lead agency. Here was, as the agency put it, "just a sample of the many meetings and other public outreach activities EPA has been involved in: September, 1993; May, 1994; November, 1994, February, 1995, March, 1996, July, 1996, October, 1996, February, 1997, June, 1997, October, 1997" when a "full page display advertisement" was placed in the *Anaconda Leader*; complemented by a mass mailing to those on the "EPA's mailing list and Anaconda Local Development Corp's mailing list." The next month, there was a "three-day Open House in Anaconda to discuss preferred alternative."[149] As with the newspaper stories, this "sample" extends only to 1998. But the following EPA statement from 2011 provides a hint: "Since 1998, EPA has published fourteen Superfund fact sheets in the local newspaper . . . discussing the . . . RD [Record of Decision]." That may suggest at least fourteen other community meetings.[150]

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[148] Transcript of "Public Meeting on the EPA Superfund Program Revised Proposed Cleanup Plan, Milltown Public Meeting." Opportunity Community Center 201 Erickson, June 10, 2004, § 3.0.

[149] EPA, "Record of Decision: Anaconda Regional Water, Waste & Soils Operable Unit," September, 1998, § 1.2.

[150] EPA, "Record of Decision Amendment: Anaconda Regional Water, Waste & Soils Operable Unit," September, 2011, p. 81.

These meetings were not meaningless public relations gimmicks. At one of them, an Anacondan asked that the entire 15 volumes of the Bliss trial be placed in the Hearst library[151] The request was granted. Eventually, the EPA heard from so many people that it "hired a part-time community relations liaison."[152] As the EPA put it with commendable understatement: "The dialogue between EPA and the community of Anaconda has been active since the inception of the site in 1983."[153] There is a rich history of stakeholder involvement in all of this.

Finally, from October, 2001 to May, 2005 at least "fifty-nine groundwater samples . . . and seven surface water samples, were collected in four separate monitoring events during high and low water conditions."[154] Is it even conceivable that those tests were not the subject of conversation in the community? Is it possible that the earlier tests on the arsenic levels in the urine of Anaconda school kids did not come up occasionally as neighbors, particularly the parents of the tested children, shared news?[155] Except for those sensory deprived, those who could not or would not see or hear, the people of Anaconda and Opportunity were conscious of where they were and what had happened there.

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[151] EPA, "Record of Decision," September, 1998, § 3.1.1.4.

[152] *Ibid.*, § 1-9; EPA, "Record of Decision," September, 1998, § 1.2.

[153] "Highlights of Community Participation," EPA, "Record of Decision," September, 1998, § 3.0.

[154] "Domestic Well Sampling Program: Summary Report & Recommendations. Opportunity, Montana," Draft: August 17, 2005; Revision: November 16, 2005, p. E-1.

[155] R. Bornschein, "The Anaconda Study: An Assessment of Residential Arsenic Exposures Among Children Living in the Vicinity of a Former Copper Smelter," September 6, 1994, pp. 6-7.

[Atlantic Richfield's Brief in Support of Motion for Summary Judgment re: CERCLA (May 17, 2013)]

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MONTANA SECOND JUDICIAL DISTRICT COURT,
SILVER BOW COUNTY

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Cause No. DV-08-173

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GREGORY A. CHRISTIAN, *et al.*,

Plaintiffs,

v.

BP Amoco Corporation, *et at.*,
ATLANTIC RICHFIELD COMPANY, *et al.*,

Defendants.

Hon. Brad Newman

ATLANTIC RICHFIELD COMPANY'S BRIEF IN SUPPORT OF MOTION FOR SUMMARY JUDGMENT ON PLAINTIFFS' CLAIM FOR RESTORATION DAMAGES AS BARRED BY CERCLA

COMES NOW Defendant Atlantic Richfield Company ("Atlantic Richfield"), by and through its counsel of record, and hereby submits its brief in support of its motion for summary judgment on Plaintiffs' claim for restoration damages as barred by the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA").

INTRODUCTION

Plaintiffs assert claims based on alleged environmental contamination to properties located within the legally defined boundaries of a federal Superfund site. The cleanup of that site has been directed by the United States Environmental Protection Agency ("EPA") under its CERCLA authority for nearly thirty years. Although CERCLA does not prohibit all common-law claims for property damages, it does bar claims that challenge EPA's selected remedy for a site or that propose an alternative or additional remedy. Because Plaintiffs' claim for restoration damages attempts to do both of those things, it is barred by CERCLA and therefore must be denied as a matter of law.

CERCLA, also known as the "Superfund" law, was enacted in 1980 to promote the cleanup of contaminated sites around the country. EPA has broad authority under CERCLA to clean up contaminated sites itself

or to require liable parties to perform the cleanup under EPA's direction, A core feature of CERCLA is that it prohibits interference with EPA's chosen remedy. CERCLA accomplishes this goal primarily by (1) barring any "challenge" to an ongoing EPA-sanctioned CERCLA cleanup, and (2) requiring that all cleanup activity at an EPA site be approved by EPA.

Plaintiffs' claim for restoration damages violates both of these CERCLA provisions. Their restoration claim is a direct attack on EPA's chosen remedy at an actively regulated Superfund site. Plaintiffs intend to criticize EPA's regulatory process, and then request a finding from this Court that a different remedy should be performed at the site—a remedy that was rejected by EPA. Although styled as a request for monetary damages, Plaintiffs' claim for restoration damages depends upon a judicial finding that they can and will perform their preferred remedy with the money awarded. Indeed, to obtain restoration damages under Montana *law, the jury must find that Plaintiff's actually will perform* their non-EPA-approved cleanup plan. But Plaintiffs cannot and will not perform their alternate remedy as a matter of law because CERCLA prohibits it. There is no genuine issue of material fact that Plaintiffs' claim for restoration damages violates CERCLA. Atlantic Richfield is therefore entitled to summary judgment as a matter of law on that claim.

* * *

ARGUMENT

CERCLA bars Plaintiffs' claim for restoration damages in two separate ways. First, CERCLA section 113(h) precludes Plaintiffs' restoration remedy because it impermissibly "challenges" the EPA-selected remedy. Second, CERCLA section 122(e)(6) precludes Plain-

tiffs' restoration remedy because it prohibits Plaintiffs from performing non-approved cleanup work at the Site. Because CERCLA prohibits Plaintiffs from performing their restoration remedy, it renders them unable to establish a prerequisite to an award of restoration damages as a matter of law. Thus, their claimed restoration damages *certainly will not be incurred in the future,* and allowing restoration damages in this case would result in exactly the sort of "windfall" the Montana Supreme Court cautioned against. The Court should therefore grant summary judgment on Plaintiffs' claim for restoration damages.

I. CERCLA Section 113 Bars Plaintiffs' Claim for Restoration Damages.

"Section 113(h) of [CERCLA] bans all challenges to ongoing remedial or removal actions." *Razore,* 66 F.3d at 238. The statute provides in part:

> No Federal court shall have jurisdiction under Federal law . . . or under State law . . . to review any challenges to removal or remedial action selected under section 9604 of this title, or to review any order issued under section 9606(a) of this title . . . .

42 U.S.C. § 9613(h).[5] This section "is clear and unequivocal," and "amounts to a blunt withdrawal of federal jurisdiction" for "any challenges" to a CERCLA cleanup. *McClellan,* 47 F.3d at 328. This section applies equally to actions brought in state courts because

[5] The statute contains five exceptions, but none apply here. Three of the five exceptions apply only to EPA, 42 U.S.C. § 9613(h)(2), (3), (5). The other two exceptions are a CERCLA cost recovery or contribution action under section 9607, *id.* (1), and a CERCLA citizen suit under section 9659 that can only be initiated after the cleanup is complete, *id.* (4).

"Congress did not intend to preclude dilatory litigation in federal courts but allow such litigation in state courts." *Fort Ord Toxics Project, Inc. v. Cal. EPA,* 189 F.3d 828, 832 (9th Cir. 1999) ("We believe Congress only removed *federal* court jurisdiction from 'challenges' to CERCLA cleanups because only federal courts shall have jurisdiction to adjudicate a 'challenge' to a CERCLA cleanup in the first place."). And this section applies to causes of action brought under state *law. Id.* (Section 113 "cover[s] any 'challenge' to a CERCLA cleanup" even if brought under state *law.); see also ARCO Envtl. Remediation, LLC v. Dept Health & Envtl. Quality,* 213 F.3d 1108, 1115 (9th Cir. 2000) (same).[6]

Thus, Plaintiffs' claim for restoration damages may proceed under section 113(h) only if "(1) the EPA has not initiated a removal or remedial action under section 9604, or (2) the plaintiffs are not 'challenging' such action." *Razore,* 66 F.3d at 239. Plaintiffs' restoration claim fails both parts of this test.

A. EPA Has Initiated Removal and Remedial Actions at the Site.

Here, EPA long ago initiated removal and remediation actions at the Site under section 9604, including with respect to Plaintiffs' properties. CERCLA defines a removal action as "the cleanup or removal of released hazardous substances from the environment," including "such actions as may be necessary to monitor, assess, and evaluate the release or threat of release of

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[6] For examples of state courts dismissing state law claims under CERCLA section 113, see *Willis v, City of Rialto,* No. E051792, 2012 WL 3871997, at * 7-9 (Cal. Ct. App. Sept. 7, 2012), *O'Neal v. Department of the Army,* 742 A.2d 1095, 1100 (Penn. Sup. Ct. 1999), and *Aztec Minerals Corp. v. Romer,* 940 P.2d 1025, 1032-33 (Colo. App. 1997), attached as Exhibit C.

hazardous substances." 42 U.S.C. § 9601(23). Remedial actions include "those actions consistent with permanent remedy taken instead of or in addition to removal action in the event of a release or threatened release of a hazardous substance." *Id. §* 9601(24). Although EPA had earlier initiated multiple removal and remedial actions at the Site, it issued its first order directly related to Plaintiffs' properties in 1988, and did so expressly under CERCLA section 9604. Bartelt Aff. ¶ 14, That order required Atlantic Richfield, among other things, to perform an RI/FS for both CSOU and ARWWS OU, Atlantic Richfield has completed those RI/FSs, and EPA has issued RODS for both CSOU and ARWWS OU. The RODS, together with certain administrative orders EPA subsequently issued, required Atlantic Richfield to begin specific remedial actions, including the remedial actions applicable to Plaintiffs' properties. Those remedial actions are ongoing today.

The Ninth Circuit has held that, when EPA begins an RI/FS, it has initiated a removal action within the meaning of section 113(h). *Razore,* 66 F.3d at 239 ("A RI/FS satisfies this definition."). Here, at a mature site under EPA regulation for nearly 30 years, where multiple RI/FSs have been completed and remedial work has begun, there can be no question that the first requirement in section 113(h) is met.

B. Plaintiffs' Claim for Restoration Damages "Challenges" EPA's Remedy for Their Properties.

The question, then, turns on whether Plaintiffs' claim for restoration damages "challenges" the CERCLA cleanup. If so, their claim must be dismissed.

"An action constitutes a challenge if it is related to the goals of the cleanup." *Razore,* 66 F.3d at 239.

Likewise, a claim challenges a CERCLA cleanup if it "interfere[s] with the remedial actions selected under CERCLA Section 104," or "seeks to improve on the CERCLA cleanup." *McClellan,* 47 F.3d at 330. The Ninth Circuit also has barred lawsuits under section 113(h) "where the plaintiff seeks to dictate specific remedial actions, to postpone the cleanup, to impose additional reporting requirements on the cleanup, or to terminate the RI/FS and alter the method and order of cleanup." *ARCO Envtl.,* 213 F.3d at 1115 (internal citations omitted).

Plaintiffs' claim for restoration damages easily satisfies these criteria for a "challenge" to an ongoing CERCLA cleanup. Plaintiffs intend to convince the jury that: (1) EPA's assessment of the risk to human health and the environment was incorrect; (2) EPA's chosen soils and groundwater remedies are insufficient; (3) soils and groundwater remedies different from the ones EPA selected are necessary to clean up Plaintiffs' properties; and (4) they actually will use any money awarded to perform their alternative remedies. It is difficult to imagine a case that more clearly "challenges" a CERCLA remedy. Accordingly, Plaintiffs' claim for restoration damages is barred by section 113(h).

Plaintiffs may argue that their restoration claim is merely a request for money damages from Atlantic Richfield, and that the mere act of Atlantic Richfield paying money to Plaintiffs does not challenge or interfere with the CERCLA remedy. CERCLA does allow damage claims so long as they do not challenge or interfere with EPA's remedy—which is why Plaintiffs' claims for damages based on diminution in property value and loss of use are not barred and not the subject of this Motion. *See Fort Ord,* 189 F.3d at 831 ("Congress did not want § 113(h) to serve as a shield

against litigation that is unrelated to disputes over environmental standards."); *Beck v. Atl. Richfield Co.,* 62 F.3d 1240, 1243 (9th Cir. 1995) (damages claim for diversion of water rights not a "challenge" because it would not interfere with the "implementation of the cleanup"). But Plaintiffs' claim for restoration damages is different. Those damages depend upon the jury finding that Plaintiffs actually will perform their restoration remedy. And it is the actual performance of Plaintiffs' restoration remedy—a prerequisite to their damage award—that impermissibly challenges EPA's remedy. Under section 113(h), a plaintiff cannot "achieve indirectly through the threat of monetary damages . . . what it cannot obtain directly through mandatory injunctive relief (to perform a remedy] incompatible with the ongoing CERCLA-mandated remediation." *Gen. Elec.,* 467 F.3d at 1249-50 (finding state's claim for restoration damages barred by section 113(h), rejecting argument that state was "not seeking to alter or expand the EPA's response plan but rather only to acquire money damages"). Indeed, Plaintiffs' remedy more than challenges EPA's remedy; it outright conflicts with it. Plaintiffs cannot seriously contend that performing their own area-wide cleanup at a Superfund Site—including digging an 8,000 foot trench for a groundwater wall and removing 650,000 tons of soil over a period of years—would not conflict with the ongoing EPA investigation and cleanup at the Site.

CERCLA allows for public input and participation in EPA's remedial decisions. But once EPA makes those decisions, CERCLA prohibits challenges like the one Plaintiffs make in this case. The Court should therefore grant summary judgment to Atlantic Richfield dismissing the restoration damages claim.

II. CERCLA Section 122 Bars Plaintiffs' Claim for Restoration Damages.

Even if Plaintiffs' claim for restoration damages did not "challenge" EPA's remedy, it is equally barred by CERCLA section 122(e)(6). That section provides:

> (6) Inconsistent response action
>
> When either the President, or a potentially responsible party pursuant to an administrative order or consent decree under this chapter, has initiated a remedial investigation and feasibility study for a particular facility under this chapter, no potentially responsible party may undertake any remedial action at the facility unless such remedial action has been authorized by the President.

42 U.S.C. § 9622(e)(6). Congress enacted this section to "avoid situations in which the PRP begins work at a site that prejudges or may be inconsistent with what the final remedy should be or exacerbates the problem." 132 Cong. Rec. S14895-02, 1986 WL 788210 (daily ed., Oct. 3, 1986). By its plain terms, section 122(e)(6) prohibits Plaintiffs' claim for restoration damages.

First, there is no genuine dispute that EPA has initiated an RI/FS at the Site pursuant to an administrative order. As discussed above, multiple RI/FSs have been completed at the Site pursuant to administrative orders, including the RI/FSs for CSOU (soils) and ARWWS OU (groundwater) that encompass Plaintiffs' properties and that are challenged by their experts.

Second, Plaintiffs are potentially responsible parties or "PRPs" under CERCLA. "CERCLA imposes strict liability for environmental contamination upon four

broad classes of PRPs." *Burlington N. & Santa Fe Ry. Co. v. United States,* 556 U.S. 599, 608 (2009). One of these classes of PRPs is current owners of property at a CERCLA facility. 42 U.S.C. § 9607(a)(1); *see also Cal. Dep't of Toxic Substances Control v. Hearthside Residential Corp.,* 613 F.3d 910, 912-13 (9th Cir. 2010) (This section "refer[s] to 'current' owners."). Current property owners are PRPs regardless of fault. *New York v. Shore Realty Corp.,* 759 F.2d 1032, 1044 (2d Cir. 1985) ("[S]ection 9607(a)(1) unequivocally imposes strict liability on the current owner of a facility . . . without regard to causation."). And current property owners are PRPs regardless of how small a percentage of the facility they own. *United States v. Rohm & Haas Co.,* 2 F.3d 1265, 1279-80 (3d Cir. 1993) (owner of less than 10% of a facility still an "owner" under CERCLA), *overruled on other grounds by United States v. E.I. DuPont de Nemours & Co.,* 432 F.3d 161 (3d Cir. 2005). By their own allegations, Plaintiffs are current property owners, Third Am. Compl. ¶ 1, and their properties are within the Site.[7]

Third, the Anaconda Smelter Superfund Site is a "facility," within the meaning of CERCLA. A facility is defined as "any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located." 42 U.S.C. § 9601(9)(B). "[T]he term 'facility' has been broadly construed by the courts, such that in order to show that an area is a 'facility,' the plaintiff need only show that a hazardous substance under CERCLA is placed there or has otherwise come to be located there." *3550 Stevens Creek Assocs. v. Barclays Bank,* 915 F.2d 1355,

[7] As noted, two Plaintiff properties extend into a neighboring Superfund site. That is immaterial to this analysis, as the neighboring site also qualifies as a CERCLA "facility." *See infra.*

1360 n.10 (9th Cir. 1990) (internal quotation marks omitted). Plaintiffs' own allegations confirm that the Site—and their properties specifically—fit the CERCLA definition of a facility. *See* Third Am. Compl ¶ 12 ("Defendants . . . caused toxic and hazardous smelter and ore processing wastes . . . to enter the air, soil, surface waters, and groundwater in and around said facilities.").[8]

Fourth, Plaintiffs' proposed remedial action has not been authorized by EPA. Indeed, Plaintiffs' whole claim for restoration damages is premised on the opposite of EPA approval: *they want to convince the jury that the EPA-approved remedy is inadequate and that their private remedy is required.* This is a dispositive failure of proof by Plaintiffs—by itself sufficient for summary judgment. *See Stipe*, ¶ 14 ([A] claim fails as a matter of law if the plaintiff fails to establish the material elements of the claim, including damages."); *Sebena,* 280 Mont. at 309, 930 P.2d at 53 (A plaintiff must prove damages "by substantial evidence."). Moreover, the undisputed evidence shows that the remedies Plaintiffs propose—far more extensive soil removal and PRB groundwater walls—not only were not approved by EPA, they were affirmatively *rejected* by EPA. Bartelt Aff. 15 31-33. There is no genuine dispute of fact on this point.

For all of these reasons, section 122(e)(6) applies to this case and prohibits Plaintiffs from performing

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[8] It does not matter whether the Court considers the relevant "facility" to be the entire Anaconda Smelter Site, some subdivision of it like CSOU, or each of Plaintiffs' individual properties. All qualify as a "facility" under CERCLA. *See generally Sierra Club v. Seaboard Farms Inc.,* 387 F.3d 1167, 1170-72 (10th Cir. 2004) (discussing breadth of "facility" definition and its applicability to a site as a whole or certain portions of it).

their proposed restoration plan. Requiring proof that property owners actually will perform their restoration "ensures that a property owner who recovers an award of restoration damages does not pocket the money instead of using the money to restore the damaged property." *McEwen,* 50. With actual performance of their restoration plan barred by CERCLA, any recovery of restoration damages in this case could only be "pocket[ed]" by Plaintiffs, rather than used to restore their property—the very "windfall" the Montana Supreme Court has forbidden. Accordingly, restoration damages may not be recovered in this case as a matter of law.

CONCLUSION

For the foregoing reasons, the Court should grant summary judgment in favor of Atlantic Richfield and dismiss Plaintiffs' claim for restoration damages with prejudice.

Dated this 17th day of May, 2013.

Respectfully submitted,

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[Affidavit of Richard E. Bartelt in Support of Atlantic Richfield's Motion for Summary Judgment re: CERCLA (May 16, 2013)]

MONTANA SECOND JUDICIAL DISTRICT
COURT, SILVER BOW COUNTY

Cause No. DV-08-173

GREGORY A. CHRISTIAN, *et al.,*

Plaintiffs,

v.

BP AMOCO CORPORATION, *et al*.,
ATLANTIC RICHFIELD COMPANY, *et al.*,

Defendants.

Hon. Brad Newman

AFFIDAVIT OF RICHARD E. BARTELT

I, Richard E. Bartelt, being over the age of eighteen, make this affidavit based upon my personal knowledge of the facts and circumstances stated herein, and state under oath as follows:

1. I am employed by ARCADIS, U.S., Inc., a consulting and engineering company.

2. I received a Bachelor of Science Degree in Civil Engineering from Iowa State University in 1970, and a Master's Degree in Sanitary Engineering from Iowa State University in 1973. Upon graduation, I worked for the United States Environmental Protection Agency ("EPA"), Region 5, from 1973 to 1987.

3. Following the enactment of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") of 1980, I became the Region 5 Superfund Coordinator and Director of the Region 5 Emergency and Remedial Response Branch, where I was in charge of CERCLA removal and remedial actions for the Region.

3. Since leaving EPA, I have provided technical and programmatic consulting services for over 100 National Priorities List ("NPL") or "Superfund" sites throughout the country.

5. In connection with the above captioned litigation, I was hired by Atlantic Richfield Company ("Atlantic Richfield") to provide expert opinions concerning the CERCLA regulatory process at the Anaconda Smelter NFL Site ("the Site").

6. In rendering my opinions, I prepared an Expert Report ("Report"), dated April 2013, that contains my expert opinions regarding this case. 1 specifically incorporate that Report by reference and make it a part of this affidavit. The opinions I express in that Report are true, correct, and accurate to a reasonable degree of certainty. A copy of my Report is attached hereto as Exhibit 1. In my Report, I identify the hundreds of documents I reviewed in the course of my analysis and in forming my opinions in this matter. Some of the citations for the documents and sources supporting my statements in this affidavit are contained in my Report.

7. In 1982, EPA and Atlantic Richfield entered into a voluntary agreement to collect data regarding actual or threatened releases of heavy metals, including arsenic, lead, cadmium, zinc, beryllium, and copper, into the environment in and around the Anaconda

Smelter. This agreement preceded formal listing of the Site on the NPL in September 1983.

8. Since those early investigations, Atlantic Richfield has cooperated with EPA, the Montana Department of Environmental Quality ("MDEQ"), and Anaconda-Deer Lodge County, on the extensive environmental investigation and cleanup at the Site.

9. In 1984, EPA issued its first Administrative Order to Atlantic Richfield. That order required Atlantic Richfield to perform a site-wide Remedial Investigation/ Feasibility Study ("RI/FS"), which Atlantic Richfield completed in 1987.

EPA has since divided the Site into five Operable Units ("OUs"). The purpose of subdividing the Site was to identify potential response actions that could be started as soon as possible, and to make site investigation and cleanup more manageable. EPA has issued a Record of Decision ("ROD") for each OU. The ROD is the document that identifies EPA's selected remedy for the particular OU.

11. The two OUs that directly apply to the Opportunity and Crackerville areas where the Plaintiffs reside are the Community Soils Operable Unit ("CSOU"), and the Anaconda Regional Water, Waste, and Soils Operable Unit ("ARWWS OU").

12. The CSOU was intended to address all residential soils (i.e., yards) impacted by past smelter operations, including residential soils in the communities of Opportunity and Crackerville.

13. The ARWWS OU was intended to be the last OU for the Site and to address all remaining contamination and impacts to surface and ground water, waste

source areas, and non-residential soils not remediated under prior response actions for the other OUs.

14. EPA issued another Administrative Order to Atlantic Richfield in 1988, which superseded the 1984 order. The 1988 order is attached as Exhibit 2. As the order says in the first paragraph, EPA issued it pursuant to CERCLA section 104, 42 U.S.C. § 9604, Although EPA had previously initiated removal and remedial actions at the Site, the 1988 order was the first administrative order at the Site where EPA ordered Atlantic Richfield to perform work directly related to the Plaintiffs' properties.

15. EPA's 1988 order was amended in 1994 to require Atlantic Richfield to conduct separate RI/FSs for both CSOU and ARWWS OU (this Seventh Amendment to the 1988 order also is included in Exhibit 2). These OU-specific RI/FSs were completed by Atlantic Richfield in 1996.

16. EPA issued separate RODs for CSOU and ARWWS OU. EPA issued the CSOU ROD in 1996, and the ARWWS OU ROD in 1998. Pursuant to EPA's decisions in these RODs and orders directing Atlantic Richfield to implement such decisions, Atlantic Richfield has performed a significant amount of remedial investigation and cleanup work at the Site.

17. Under the residential component of the CSOU ROD, which applies to the Plaintiffs' properties in this case, EPA required Atlantic Richfield to remediate residential soils that exceeded 250 parts per million ("ppm") of arsenic by removing soil to a depth of as much as 18 inches below the surface, and replacing it with clean soil and a vegetative cover.

18. Because the EPA determined that the contamination identified in the communities of Opportunity

and Crackerville did not present a risk to human health or the environment sufficient to warrant inclusion in the CSOU focus area, testing of soils in those communities under the CSOU ROD was conducted on a voluntary basis.

19. At the request of residents, many of the yards in Opportunity and Crackerville, including some of the Plaintiffs' yards, were tested under this program, Yards that tested over 250 ppm arsenic (yard-weighted average) were remediated pursuant to the CSOU ROD.

20. Under the CSOU ROD, approximately 1,740 residences in Anaconda and the surrounding areas (including Opportunity and Crackerville) were sampled, and 350 yards where the average arsenic concentration for the yard exceeded 250 ppm arsenic were cleaned up.

21. Atlantic Richfield cleaned up two of the Plaintiffs' yards under the CSOU ROD, and has standing offers to clean up other Plaintiffs' properties based on testing conducted in connection with this lawsuit.

22. In 2012, EPA published a proposed plan for a CSOU ROD amendment to address concerns that arsenic and lead concentrations were higher in deeper soils than had been previously anticipated. The CSOU ROD amendment will require additional testing and potentially, additional cleanup of residential yards. The Plaintiffs' properties will be included within the area covered by the ROD amendment. Upon completion of the ROD amendment, EPA will require Atlantic Richfield to perform the testing and any additional cleanup work that may be required by the amendment.

23. EPA also directed Atlantic Richfield to conduct work relating to Plaintiffs' properties through the ARWWS OU ROD. A 2011 amendment to the ARWWS

ROD required testing and remediation of residential wells throughout the OU, including in Opportunity and Crackerville. Atlantic Richfield conducts a domestic well sampling and replacement program pursuant the ARWWS ROD Amendment, which ensures a safe drinking water supply for households within the OU. Since 2009, domestic well testing of Opportunity and Crackerville residents, including the Plaintiffs, has been performed by the Montana Bureau of Mines and Geology under a contract with Atlantic Richfield.

24. The Federal Safe Drinking Water Act Maximum Contaminant Level for arsenic is 10 parts per billion ("ppb"). The State of Montana also has a numeric water quality standard for surface and ground water of 10 ppb arsenic.

25. Under the ARWWS OU domestic well sampling program, if a domestic well tests below 5 ppb arsenic, no further action is taken. If a well tests over 5 ppb but under 10 ppb arsenic, the well is monitored annually for a period of three years to make certain it does not exceed 10 ppb arsenic. If a well tests over 10 ppb arsenic, the well is replaced and bottled water is provided to the homeowner in the interim until well replacement is complete and water quality is confirmed.

26. Two wells on properties owned by Plaintiffs tested above 10 ppb arsenic, and Atlantic Richfield replaced both of those wells pursuant to the ARWWS OU ROD Amendment.

27. Also under the ARWWS OU ROD, Atlantic Richfield has remediated large areas of non-residential soils, former disposal ponds associated with the smelter facility, fluvial tailings areas, and portions of Warm Springs Creek,

28. All of the work performed to date by Atlantic Richfield or its contractors to implement the CSOU and ARWWS OU RODs has been supervised and approved by EPA. The investigation and cleanup work under the CSOU ROD and the ARWWS OU ROD is ongoing.

29. I am familiar with the regulatory requirements for public participation and community input in a CERCLA cleanup that are contained in the National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan or the "NCP." From my analysis in this case, including an extensive review of the administrative record and interviews with EPA and MDEQ officials, I conclude that EPA, the State, and Atlantic Richfield have complied with the NCP's requirements for public participation. There is a substantial record of public participation and community involvement since the very beginning of the cleanup at this Site, including with respect to EPA's decisions concerning CSOU and ARWWS OU. The responsiveness summaries attendant to each of EPA's RODs for the Site document this commitment as early as 1983—before any CERCLA requirements for public participation bad been specified. The public has had ample opportunity to comment on whether EPA's selected remedies for this Site are protective of human health and the environment as required by CERCLA.

30. The EPA maintains an Administrative Record for the Site, which contains tens of thousands of documents relating to the environmental investigation and cleanup that has been done and is being done. Since the Site was listed, EPA has issued six records of decision and more than 25 separate administrative orders (not counting amendments) directing Atlantic

Richfield to conduct CERCLA removal or remediation work at the Site.

31. I have reviewed the proposed remedies offered in the report of Plaintiffs' expert John R. Kane, dated April 15, 2013. EPA considered both soil and groundwater remedies similar to those proposed by Mr. Kane, but rejected such remedies in the course of its regulatory deliberations at the Site.

32. EPA established the action level of 250 ppm arsenic in residential soils after completing a human health risk assessment. In establishing the action level of 250 ppm arsenic, EPA considered a target risk range of screening levels from 3 ppm to 297 ppm (as described in the CSOU ROD). If EPA had chosen a lower action level, more extensive soil removal and yard replacements similar to the ones Mr. Kane proposes would have been required. However, EPA rejected such alternative action levels as unnecessary to protect human health and the environment.

33. In the process of selecting a remedy for groundwater and surface water in the Opportunity and Crackerville areas, EPA also considered in situ reactive walls similar to the passive reactive barrier wall ("PRB wall") proposed by Mr. Kane. In EPA's Technical Impracticability Evaluation Report entitled "Achievement of Arsenic Human Health Standard in Surface Water and Ground Water in the South Opportunity Area of Concern," EPA considered a permeable reactive barrier up-gradient of Opportunity that would use zero valiant iron as a material to remove arsenic, at a cost of nearly $60 million. However, EPA rejected such a barrier wall as unnecessary to protect human health and the environment.

FURTHER AFFIANT SAYETH NAUGHT.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 16th day of May, 2013.

By: /s/ Richard E. Bartelt
Richard E. Bartelt

Subscribed and sworn to before me this 16th day of May, 2013, by Richard Bartelt.

Witness my hand and official seal.

/s/ Pamela A. Thompson
Notary Public

My Commission Expires: 5-12-2014.

OFFICIAL SEAL
PAMELA A THOMPSON
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES: 05/12/14

[Plaintiffs' Brief in Opposition to Motion for Summary Judgment re: CERCLA (June 7, 2013)]

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MONTANA SECOND JUDICIAL DISTRICT COURT,
SILVER BOW COUNTY

———

Cause No. DV-08-173 BN

———

GREGORY A. CHRISTIAN; *et al.*,

Plaintiffs,

v.

BP AMOCO CORPORATION; *et al.*,

Defendants.

———

PLAINTIFFS' BRIEF IN OPPOSITION TO ARCO'S MOTION FOR SUMMARY JUDGMENT and IN SUPPORT OF PLAINTIFFS' CROSS-MOTION FOR SUMMARY JUDGMENT ON ARCO'S CERCLA PREEMPTION AFFIRMATIVE DEFENSES (11th-13th)

INTRODUCTION

The Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") does not preempt Montana law, which recognizes that restoration damages constitute the only remedy that affords a plaintiff full compensation for the contamination of personal property. CERCLA expressly states that the Act shall not "effect or modify in any way" remedies provided for under state common law.

Defendant Atlantic Richfield Company ("ARCO") asserts two affirmative defenses contending Plaintiffs' claims are "barred" by CERCLA, and a third defense alleging Plaintiffs' claims are "preempted" by federal law. ARCO also filed a motion for summary judgment asking the Court to find as a matter of law that Plaintiffs' claim for restoration damages is "barred by CERCLA," in effect arguing CERCLA preempts that remedy.

ARCO relies upon two sections of CERCLA in support of its motion. First, ARCO incorrectly argues that Plaintiffs' claim constitutes a prohibited "challenge" to the EPA's remedial action under CERCLA §113(h). Second, ARCO submits that restoration damages are an "inconsistent remedy" under §122(e)(6).

ARCO's affirmative defenses and motion ignore established case law as well as the savings provisions in CERLCA that expressly preserve Plaintiffs' right to pursue restoration of damages under state common

law. Therefore, §113(h) and §122(e)(6) are inapplicable and irrelevant to Plaintiffs' claims. The Court should simply rule, consistent with CERCLA's broad savings clauses, that CERCLA does not affect in any way a private citizen's right to bring state law claims for property damage. ARCO's analysis regarding §113(h) and §122(e)(6) is immaterial and irrelevant to Plaintiffs' claims,

Assuming (incorrectly) that CERCLA does apply, ARCO's motion still must fail. First, §113(h) does not deprive this Court of jurisdiction because Plaintiffs' claims are not a "challenge" to ongoing remedial or removal actions. It is well-established that private common law claims for property damage, even when they seek restoration damages for property contamination, are not "challenges." Section 113(h) was intended to prohibit dilatory polluter challenges to EPA mandated cleanup. Congress specifically exempted private actions such as the present case from those claims affected by CERCLA § 113(h).

Second, §122(e)(6), the inconsistent remedy provision of CERCLA, does not bar Plaintiffs' restoration claim. Plaintiffs, as innocent, contiguous landowners, are not the type of Potentially Responsible Parties ("PRPs") contemplated by CERCLA. Even if the definition of PRPs could be read to include the Plaintiffs, ARCO ignored the "innocent landowner" and "contiguous landowner" exceptions, which preclude Plaintiffs from being classified as PRPs.

Finally, as held by various courts, restoration damages do not run afoul of CERCLA and cannot be considered either "challenges" or "inconsistent remedies." The purpose of CERCLA is to facilitate environmental cleanup through a federally mandated system. CERCLA sets the floor, not the ceiling, for environmental clean-

up. Congress specifically recognized the rights of private property owners to take additional action to hold polluters responsible for the contamination of private property. CERCLA even contemplates situations where private citizens obtain restoration benefits through private litigation. The Court should deny ARCO's motion and grant summary judgment to Plaintiffs, rejecting ARCO's eleventh, twelfth, and thirteenth affirmative defenses as a matter of law.

* * *

[Atlantic Richfield's Reply in Support of Motion for Summary Judgment re: CERCLA (July 1, 2013)]

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Attorneys for Defendant Atlantic Richfield Company

MONTANA SECOND JUDICIAL DISTRICT COURT,
SILVER BOW COUNTY

———

Cause No. DV-08-173

———

GREGORY A. CHRISTIAN, *et al.*,

Plaintiffs,

v.

BP AMOCO CORPORATION, *et al.*,
ATLANTIC RICHFIELD COMPANY, *et al*,

Defendants.

———

ATLANTIC RICHFIELD COMPANY'S REPLY IN SUPPORT OF MOTION FOR SUMMARY JUDGMENT ON PLAINTIFFS' CLAIM FOR RESTORATION DAMAGES AS BARRED BY CERCLA AND RESPONSE TO PLAINTIFFS' CROSS-MOTION

COMES NOW Defendant Atlantic Richfield Company ("Atlantic Richfield"), by and through its counsel of record, and hereby submits its combined reply in support of its motion for summary judgment on Plaintiffs' claim for restoration damages as barred by CERCLA, and its response to Plaintiffs' related cross-motion.

INTRODUCTION

Plaintiffs' Response fails to address the central premise of Atlantic Richfield's Motion—that the restoration award Plaintiffs seek constitutes a "challenge" to the ongoing cleanup directed by EPA and thus is barred by CERCLA. Under Montana law, Plaintiffs' requested award of restoration damages requires a judicial finding that they actually will perform their proposed environmental cleanup with the money awarded. In this case, the cleanup Plaintiffs must perform includes (1) constructing an 8,000-foot underground barrier wall on property not owned by any Plaintiff and (2) removing two feet of soil on each of Plaintiffs' properties, hauling that soil out of state, and replacing it with soil not approved by EPA. Plaintiffs do not explain how they could perform these remedies—remedies that EPA has already specifically rejected—at an active federal Superfund Site without that being a "challenge" to the remedy that EPA selected and is still performing at the site. The answer, of course, is

that they cannot. For this reason alone, the Motion should be granted.

CERCLA section 113(h) bars any "challenge" to EPA's chosen remedy and provides a statutory defense to Plaintiffs' restoration claim. Plaintiffs' arguments to avoid the statute's straightforward application are meritless. First, Plaintiffs focus on federal preemption of state laws, a concept completely separate from the federal statutory defense asserted here and irrelevant to this Motion. Second, Plaintiffs rely on CERCLA's savings clauses and the conflicting legislative history of CERCLA. As demonstrated below, however, CERCLA's savings clauses plainly state that they do not affect section 113(h)'s ban on challenges to EPA's chosen remedy, and the legislative history cannot alter the plain language of the statute. Third, Plaintiffs argue that Atlantic Richfield ignores established law, but Plaintiffs' "established law" turns out to be a single district court case from Florida. Even that case, however, does not support Plaintiffs' argument because, in a key difference between Florida and Montana law, the plaintiffs there did not have to prove that they would actually perform their restoration remedy. The overwhelming weight of federal appellate law demonstrates that Plaintiffs' restoration claim constitutes an impermissible "challenge" to an EPA remedy under section 113(h).

Plaintiffs' Response also fails to rebut Atlantic Richfield's second, separate ground for summary judgment—that CERCLA section 122(e)(6) bars private cleanups at a site where EPA is performing a CERCLA cleanup, absent EPA's authorization. Plaintiffs do not claim to have EPA's permission to perform their cleanup—nor could they, since EPA rejected it. Instead, Plaintiffs argue that they qualify for the

narrow defenses to CERCLA liability and thus are outside the scope of the statute. But Plaintiffs do not offer a shred of evidence to support their claim to such defenses—which is their burden to prove—and the record evidence shows that they could not qualify for such defenses in any event.

Atlantic Richfield's Motion should therefore be granted, and Plaintiffs' cross-motion should be denied.

* * *

[Supplemental Expert Disclosure of John R. Kane (July 31, 2013)]

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MONTANA SECOND JUDICIAL DISTRICT COURT,
SILVER BOW COUNTY

———

Cause No. DV-08-173 BN

———

GREGORY A. CHRISTIAN; *et al.*,

Plaintiffs,

v.

BP AMOCO CORPORATION; *et al.*,

Defendants.

———

PLAINTIFFS' SUPPLEMENTAL
EXPERT DISCLOSURE

———

Plaintiffs hereby supplement their April 15, 2013, expert disclosure as follows:

2. John Kane, L.G., L.H.G.
CEO/President
KANE ENVIRONMENTAL, INC.
3815 Woodland Park Avenue North, Suite 102
Seattle, WA 98103

Based on representations of ARCO's counsel of the availability of a nearby depository site and the disclosure of ARCO's expert David Folkes, the transportation cost per ton of contaminated soil will likely be reduced if the Opportunity Ponds or other nearby sites are made available for disposal of soil. Additional cost estimates will be provided once it is confirmed the site near Anaconda is available.

As explained in John Kane's deposition, the upper (95-99%) confidence limit (UCL) for background concentrations of metals is an appropriate figure to consider an acceptable background concentration. Background concentrations based on the UCL will be provided as indicated in the deposition.

DATED, this 31st day of July 2013.

SUBMITTED BY:

/s/ Monte D. Beck
Monte D. Beck, Esq.
BECK & AMSDEN, PLLC

[Supplemental Expert Disclosure of John R. Kane (Sept. 16, 2013)]

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MONTANA SECOND JUDICIAL DISTRICT COURT,
SILVER BOW COUNTY

Cause No. DV-08-173 BN

GREGORY A. CHRISTIAN; *et al.*,

Plaintiffs,

v.

BP AMOCO CORPORATION; *et al.*,

Defendants.

PLAINTIFFS' SECOND SUPPLEMENTAL
EXPERT WITNESS DISCLOSURE

Based on information recently provided by Defendant Atlantic Richfield Company (ARCO), and information gathered in the course of discovery, John Kane may provide testimony consistent with the documents attached hereto. In particular, Mr. Kane may testify to revised restoration costs, based on ARCO's representation that contaminated soil from Opportunity could be disposed of, at no cost, at ARCO's waste repository near Opportunity. The revised costs are set forth in the documents attached hereto. Additionally, calculations for the background confidence intervals referenced in Plaintiffs' July 31 supplemental expert disclosure are attached hereto.

DATED this 16th of September, 2013.

LEWIS, SLOVAK & KOVACICH, P.C.
and
BECK & AMSDEN, PLLC

By: /s/ Mark M. Kovacich
Mark M. Kovacich
P.O. Box 2325
Great Falls, MT 59403
Attorneys for Plaintiffs

KANE
ENVIRONMENTAL INC

September 13, 2013

Mr. Mark Kovacich
Lewis, Slovak & Kovacich, P.C.
725 Third Avenue North
Great Falls MT 59401

RE: Revised Restoration Estimated Costs

Mr. Kovacich:

Enclosed are two spreadsheets for the Opportunity and Crackerville Restoration. The Anaconda Repository spreadsheet includes the revised estimated costs for the restoration activity based on soil disposal at the Anaconda Repository operated by ARCO. I have based this estimate on the premise that there will be no fees or charges associated with the disposal and management of soil after its' disposal at the Anaconda Repository. The Butte Landfill spreadsheet includes the estimated costs for the restoration activity based on soil disposal at the Butte/Silver Bow County Landfill in Butte, Montana. These costs include a $20 disposal fee to dispose of the soil at the landfill. Please note that the trucking costs for both scenarios were based on my conversations with three local trucking companies in the Anaconda/Butte area, and are based on estimates and not contractual bidding.

Please contact me at (206) 691-0476 if you have any questions.

Thank you.

Regards,
KANE ENVIRONMENTAL, INC.
/s/ John Kane
John Kane
CEO President

IRON FILINGS WALL GROUNDWATER RESTORATION
SURFACE SOIL EXCAVATION AND RESTORATION
SEPTEMBER 13, 2013
ANACONDA REPOSITORY
Task 1 - Soil Excavation and Restoration

Excavator/Operator	400	days	$4,000	$1,600,000	2 excavators 812.5 tons per day; 5 days/ week; 20 months
Soil Disposal Cost	650000	tons	$0	$0	Anaconda Repository
Soil Disposal Cost - Transportation	650000	tons	$12.00	$7,800,000	Disposal at Anaconda Repository (includes clean fill back haul from Rock
Clean Fill Import	650000	tons	$1	$650,000	
Topsoil	37,000	yards	$1	$37,000	
Sod	6,022,000	sq ft	$0.20	$1,204,400	
SubTotal				**$11,291,400**	

Task 2 - Iron Filings Wall Installation

Excavator/Operator - Opportunity	80	days	$4,000	$320,000	2 excavators; 5 days/ week; 4 months
Excavator/Operator - Crackerville	40	days	$4,000	$160,000	2 excavators; 5 days/ week; 2 months
Soil Removal for Opportunity Wall	20000	tons	$0	$0	Anaconda Repository
Soil Removal for Crackerville Wall	10000	tons	$0	$0	Anaconda Repository
Soil Disposal Cost - Transportation	30000	tons	$12	$360,000	Disposal at Anaconda Repository (includes clean fill back haul from Rock
					vertical square feet (vsf) = 15
Iron Filing Wall Installation - Opportunity	120000	vsf	$50	$6,000,000	ft depth x 8000 ft length
					vertical square feet (vsf) = 15
Iron Filing Wall Installation - Crackerville	60000	vsf	$50	$3,000,000	ft depth x 4000 ft length
Iron Filing Cost	180,000	vsf	$20	$3,600,000	
Subtotal				**$13,440,000**	
Pilot Test		lump sum	$500,000	$500,000	
Contingency			20%	**$4,946,280**	
Legal Council Cost				$334,000	
SubTotal Task 1, Task 2 and Contingency				**$30,511,680**	
Engineering/Design/Management					
Project Management			5%	$1,525,584	
Remedial Design			5%	$1,525,584	
Construction Management			6%	$1,830,701	
O&M Technical Support			8%	$2,440,934	
SubTotal				**$7,322,803**	

Estimated Total Project Cost = $37,834,483

IRON FILINGS WALL GROUNDWATER RESTORATION
SURFACE SOIL EXCAVATION AND RESTORATION
SEPTEMBER 13, 2013
BUTTE LANDFILL

Task 1 - Soil Excavation and Restoration

Excavator/Operator	400	days	$4,000	$1,600,000	2 excavators 812.5 tons per day; 5 days/ week; 20 months
Soil Disposal Cost	650000	tons	$20	$13,000,000	Butte Landfill
Soil Disposal Cost - Transportation	650000	tons	$18.00	$11,700,000	Disposal at Butte Landfill (includes clean fill back haul from Rocker)
Clean Fill Import	650000	tons	$1	$650,000	
Topsoil	37,000	yards	$1	$37,000	
Sod	6,022,000	sq ft	$0.20	$1,204,400	
SubTotal				**$28,191,400**	

Task 2 - Iron Filings Wall Installation

Excavator/Operator - Opportunity	80	days	$4,000	$320,000	2 excavators; 5 days/ week; 4 months
Excavator/Operator - Crackerville	40	days	$4,000	$160,000	2 excavators; 5 days/ week; 2 months
Soil Removal for Opportunity Wall	20000	tons	$20	$200,000	Butte Landfill
Soil Removal for Crackerville Wall	10000	tons	$20	$600,000	Butte Landfill
Soil Disposal Cost - Transportation	30000	tons	$18	$540,000	Disposal at Butte Landfill (includes clean fill back haul from Rocker)
					vertical square feet (vsf) = 15
Iron Filing Wall Installation - Opportunity	120000	vsf	$50	$6,000,000	ft depth x 8000 ft length
					vertical square feet (vsf) = 15
Iron Filing Wall Installation - Crackerville	60000	vsf	$50	$3,000,000	ft depth x 4000 ft length
Iron Filing Cost	180,000	vsf	$20	$3,600,000	
Subtotal				**$14,420,000**	
Pilot Test		lump sum	$500,000	$500,000	
Contingency			20%	**$8,522,280**	
Legal Council Cost				$334,000	
SubTotal Task 1, Task 2 and Contingency				**$51,967,680**	
Engineering/Design/Management					
Project Management			5%	$2,598,384	
Remedial Design			5%	$2,598,384	
Construction Management			6%	$3,118,061	
O&M Technical Support			8%	$4,157,414	
SubTotal				**$12,472,243**	
			Estimated Total Project Cost =	**$64,439,923**	

TerraStat
CONSULTING GROUP

Memorandum

To: John Kane, Kane Environmental, Inc.
From: Tamre Cardoso, TerraStat Consulting Group
Date: 4 August 2013
Re: Confidence Intervals for Metals in Soil and Groundwater

This memo summarizes the methods used and results obtained when calculating confidence intervals for subsets of the data from both soil and groundwater. The objective of this analysis was to compare metal concentrations at different depth intervals using a confidence interval approach for soils and to report confidence intervals or a single depth intervals for groundwater.

Soil Data

Caveats/Assumptions

- Used full data set (tblResult.xlsx in Dropbox folder TerraStat/Analytical Data/June 2(ALL) & October)
- Only used data with Basis Code = "Dry" AND Sample Source = "Soil" AND Field Action = "Sample." Thus, the summaries do not contain any laboratory duplicates.
- Data were further subsetted into two groups
  - samples with ending depths less than 2 feet
  - samples with starting depths of 2 feet or more

- The sample with Sample ID = "OPP-COL700-Basement Soil" was excluded because there was no depth information.
- Result values for any samples with qualifier type "U" were taken to be one-half the detection limit.
- After extracting the data using the criteria listed above, there were n = 326 samples in the less than two feet category and n = 168 samples in the greater than two feet category.
- Summary statistics are un-weighted, meaning numbers of samples within different depth intervals or parcel size were taken into consideration when calculating the summary statistics.

Summary of Data

The data distributions for all metals are highly right-skewed; thus, a natural log transformation was applied to each subset of data to achieve more unimodal, approximately symmetric distributions. Figures 1 – 5 show histograms and boxplots of the sample data on the original scale and after a natural log transformation. Table 1 shows summary statistics for untransformed and natural log transformed data for each of two depth categories.

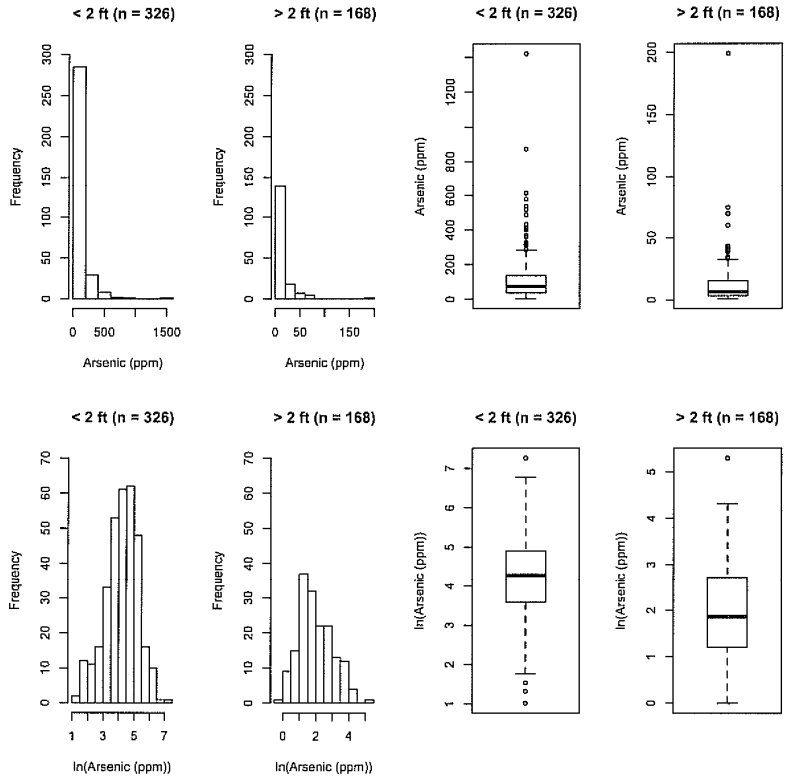

Figure 1. Histograms (left) and boxplots (right) for arsenic in soil samples less than 2 ft. and greater than 2 ft. The y-axes for each set of histograms have identical scales to make it easier to compare the two distributions.

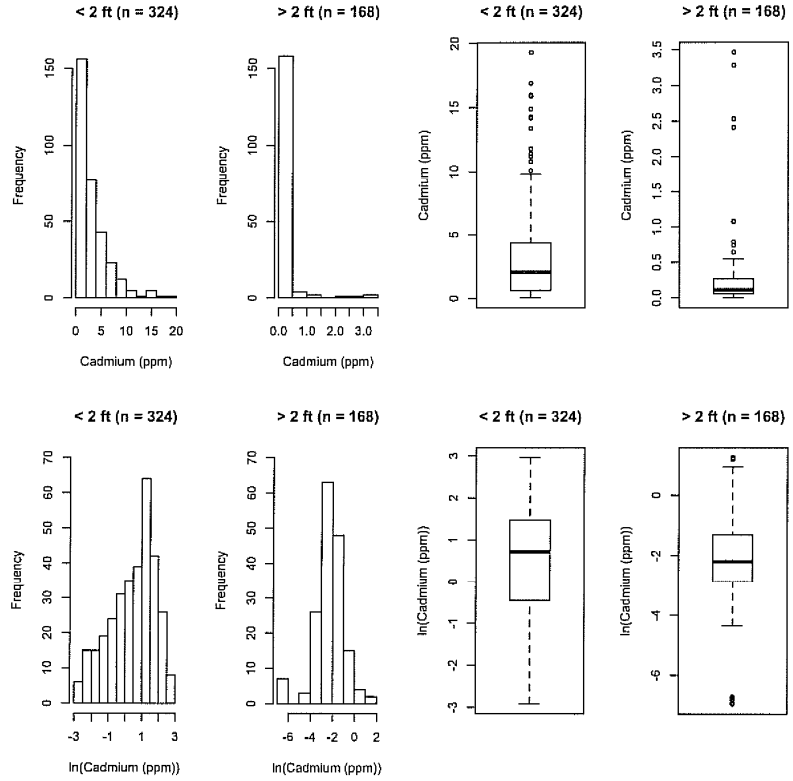

Figure 2. Histograms (left) and boxplots (right) for cadmium in soil samples less than 2 ft. and greater than 2 ft. The y-axes for each set of histograms have identical scales to make it easier to compare the two distributions.

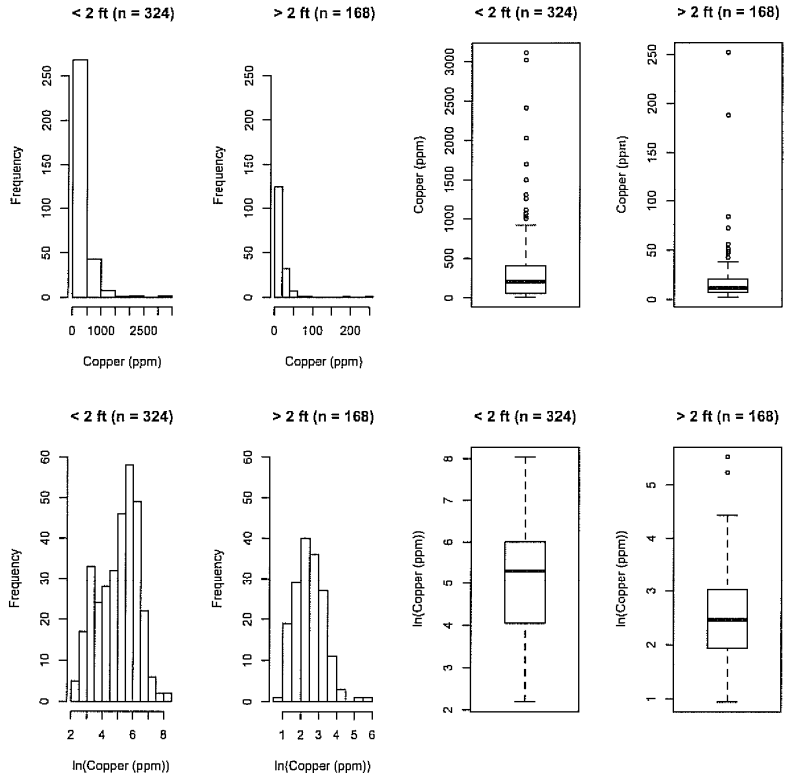

Figure 3. Histograms (left) and boxplots (right) for copper in soil samples less than 2 ft. and greater than 2 ft. The y-axes for each set of histograms have identical scales to make it easier to compare the two distributions.

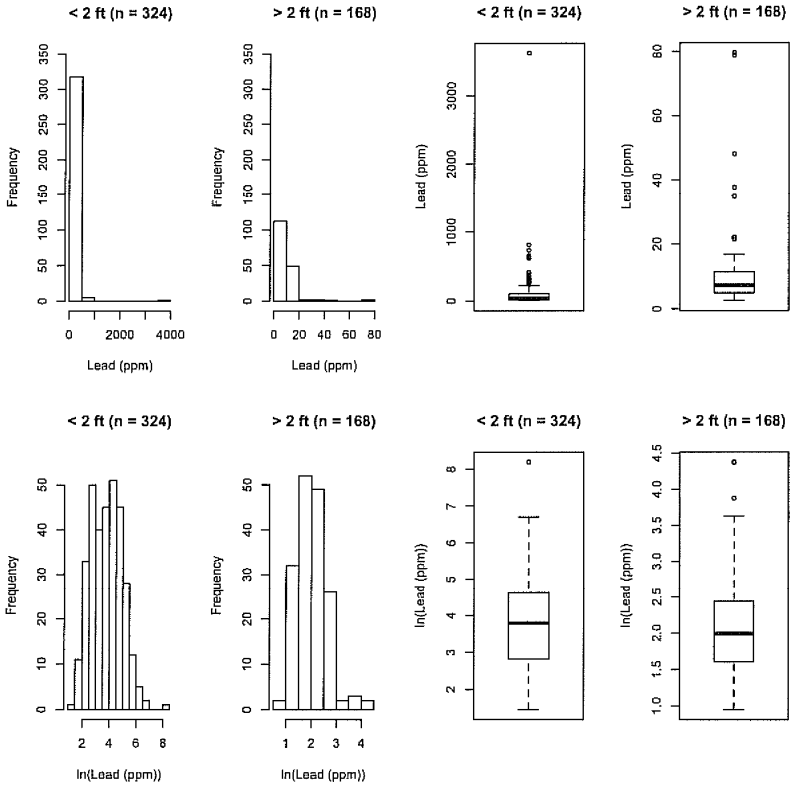

Figure 4. Histograms (left) and boxplots (right) for lead in soil samples less than 2 ft. and greater than 2 ft. The y-axes for each set of histograms have identical scales to make it easier to compare the two distributions.

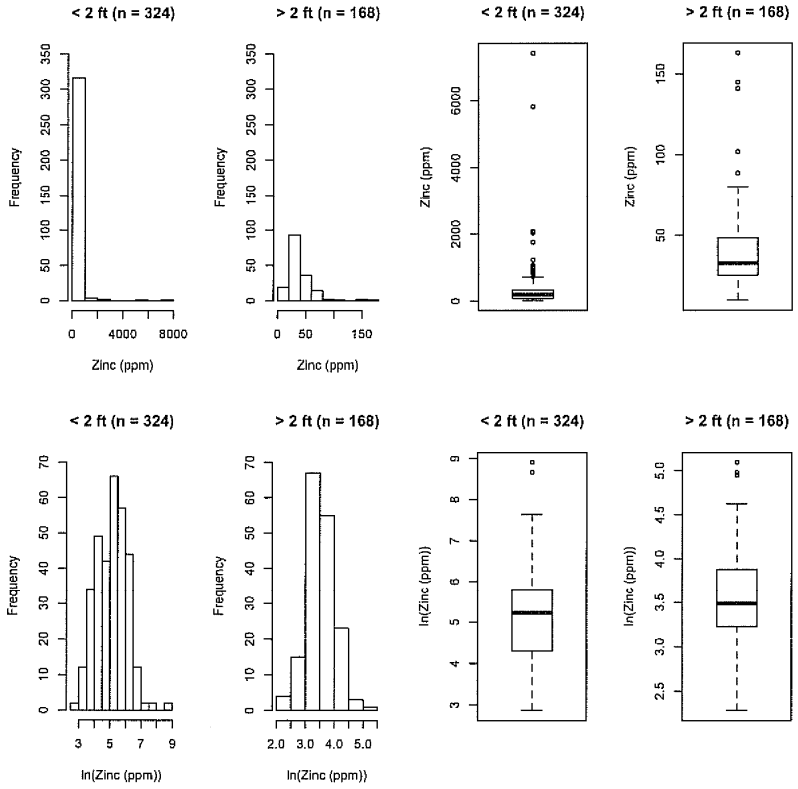

Figure 5. Histograms (left) and boxplots (right) for zinc in soil samples less than 2 ft. and greater than 2 ft. The y-axes for each set of histograms have identical scales to make it easier to compare the two distributions.

Table 1. Summary statistics, in ppm, for subjects of soil data.

Metal	Data	Sample Subset	*n*	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	SD
Arsenic	Original	≤ 2 ft.	326	2.77	36.10	72.45	110.50	134.50	1420.00	134.126
		> 2 ft.	168	0.994	3.38	6.445	12.98	15.15	199.00	19.883
	Natural log transformed	≤ 2 ft.	326	1.019	3.59	4.283	4.20	4.90	7.26	1.061
		> 2 ft.	168	−0.006	1.22	1.86	1.99	2.72	5.29	1.019
Cadmium	Original	≤ 2 ft.	324	0.054	0.638	2.055	3.091	4.380	19.30	3.282
		> 2 ft.	168	0.001	0.0571	0.111	0.232	0.269	3.460	0.461
	Natural log transformed	≤ 2 ft.	324	−2.917	−0.450	0.720	0.456	1.477	2.960	1.341
		> 2 ft.	168	−6.954	−2.863	−2.203	−2.273	−1.315	1.241	1.390
Copper	Original	≤ 2 ft.	324	8.94	57.42	201.00	301.50	403.00	3110.00	383.576
		> 2 ft.	168	2.56	6.958	11.750	17.940	20.420	252.00	25.936
	Natural log transformed	≤ 2 ft.	324	2.191	4.050	5.303	5.040	5.999	8.042	1.266
		> 2 ft.	168	0.940	1.940	2.464	2.502	3.017	5.529	0.795
Lead	Original	≤ 2 ft.	324	4.29	16.78	44.30	92.64	102.00	3620.00	224.989
		> 2 ft.	168	2.580	4.962	7.315	9.577	11.420	79.500	9.646
	Natural log transformed	≤ 2 ft.	324	1.456	2.820	3.791	3.799	4.625	8.194	1.143
		> 2 ft.	168	0.9478	1.602	1.990	2.035	2.436	4.376	0.606
Zinc	Original	≤ 2 ft.	324	17.50	73.60	186.50	293.80	330.20	7400.00	569.129
		> 2 ft.	168	9.79	25.20	32.70	38.76	48.22	163.00	22.628
	Natural log transformed	≤ 2 ft.	324	2.862	4.299	5.228	5.130	5.800	8.909	0.991
		> 2 ft.	168	2.281	3.227	3.487	3.528	3.876	5.094	0.499

Confidence Interval Calculations

Two sets of confidence intervals were calculated using different metrics:

1. Metric 1 applied a standard confidence interval to the sample mean of the log transformed data using the formula $\bar{x} \pm z_{(a/2)} \times \frac{s}{\sqrt{n}}$ where s is the sample standard deviation, n is the sample size, $z_{(a/2)}$ is the critical value for the 100% - a% confidence level. A z-score is used in lieu of a t value since the sample sizes are relatively large. Confidence intervals were calculated using a = 0.01 (z = 2.576), resulting in 99% confidence intervals, as well as using a = 0.05 (z = 1.96), resulting in 95% confidence intervals. When applied to a log-normal distribution, these intervals are equivalent to an interval for the geometric mean of the data on the original scale. Assuming that the population is log-normally distributed, this interval is equivalent

to an interval for the median on the original scale of the data.

2. Metric 2 assumed a log-normal distribution for the population of arsenic values and applied a standard confidence interval to the expected value, *E(X)*, of the log transformed data using the same interval estimator described in (1) above, with the expected value estimated as $\widehat{E(X)} = e^{\bar{x}+\frac{1}{2}\widehat{var(X)}}$ where $\widehat{Var(X)} = (e^{s^2} - 1) \times e^{2\bar{x}+s^2}$. These intervals give an interval for the mean of the data on the original scale.

The confidence intervals are summarized in Tables 2 and 3.

Table 2. 99% confidence intervals for soil based on the geometric mean and the mean assuming a log-normal distribution, by depth subset.

		CI for the geometric mean (metric 1 above)		CI for he mean (metric 2 above)	
Metal	Sample Subset	LL	UL	LL	UL
Arsenic	≤ 2 ft.	57.298	77.555	92.935	141.116
	>2 ft.	5.974	8.959	8.996	15.603
Cadmium[1]	≤ 2 ft.	1.303	1.911	2.632	5.123
	>2 ft.	0.078	0.136	0.140	0.401
Cooper[1]	≤ 2 ft.	128.809	185.066	246.025	442.217
	> 2 ft.	10.424	14.298	13.621	19.868
Lead	≤ 2 ft.	37.913	52.592	65.677	106.029
	>2 ft.	6.786	8.633	7.979	10.412
Zinc	≤ 2 ft.	146.674	194.767	225.074	327.174
	>2 ft.	30.834	37.593	34.482	42.623

[1] Under a lognormal distribution the sample data for < 2 ft. do not appear to have a normal distribution. Thus, the median (under the original scale) does not fall within the reported interval for the geometric mean.

Table 3. 95% confidence intervals for soil based on the geometric mean and the mean assuming a log-normal distribution, by depth subset.

		CI for the geometric mean (metric 1 above)		CI for the mean (metric 2 above)	
Metal	Sample Subset	LL	UL	LL	UL
Arsenic	≤ 2 ft.	59.410	74.798	98.710	135.355
	> 2 ft.	6.271	8.535	9.786	14.813
Cadmium[1]	≤ 2 ft.	1.364	1.826	2.930	4.825
	> 2 ft.	0.084	0.127	0.171	0.370
Cooper[1]	≤ 2 ft.	134.513	177.219	269.483	418.759
	> 2 ft.	10.826	13.768	14.368	19.121
Lead	≤ 2 ft.	39.426	50.574	70.501	101.204
	> 2 ft.	6.984	8.388	8.270	10.121
Zinc	≤ 2 ft.	151.733	188.273	237.281	314.967
	> 2 ft.	31.573	36.712	35.455	41.649

[1] Under a lognormal distribution the sample data for ≤ 2 ft. do not appear to have a normal distribution. Thus, the median (under the original scale) does not fall within the reported interval for the geometric mean.

Regardless of the metric that is used (geometric mean or mean), assuming the population of the various metals are log-normally distributed, the confidence intervals based on samples less than 2 ft. and samples greater than 2 ft. do not overlap. Given that there is no overlap between the 99% confidence intervals, this provides strong evidence that both the median and mean levels between the two depth groups are statistically different for all metals.

Ground Water Data

Caveats/Assumptions

- Used data set (MT Groundwater Background Data.xlsx in Dropbox folder TerraStat/ Groundwater/Groundwater Background Levels/ Data)
- Only used data with Procedure = "TOTAL RECOVERABLE" AND Site Type = "WELL."
- Removed record 108 because it was a duplicate.
- Any results reported as < some value were taken to be the value (just stripped off the <). The data file does not include detection limits. Assuming the reported value is a detection limit, then this would be the same as 1 * DL.
- Only considering samples collected from ≥ 20 feet in depth.

Summary of Data

Histograms for groundwater values are shown in Figures 6 and 7. The data are heavily right-skewed. Even with a natural log-transformations, the data for arsenic and zinc remain somewhat right-skewed. The data for cadmium and lead show a couple of modes. The data for copper is approximately symmetric, but may have more than one mode. Given that the data do not look approximately normal under a natural log transformation, the population for groundwater values may not be log-normally distributed. The use of a Gamma distribution might be better, but this option will not be considered in the summaries for this memo. All calculations are based on the assumption of a log-normal distribution.

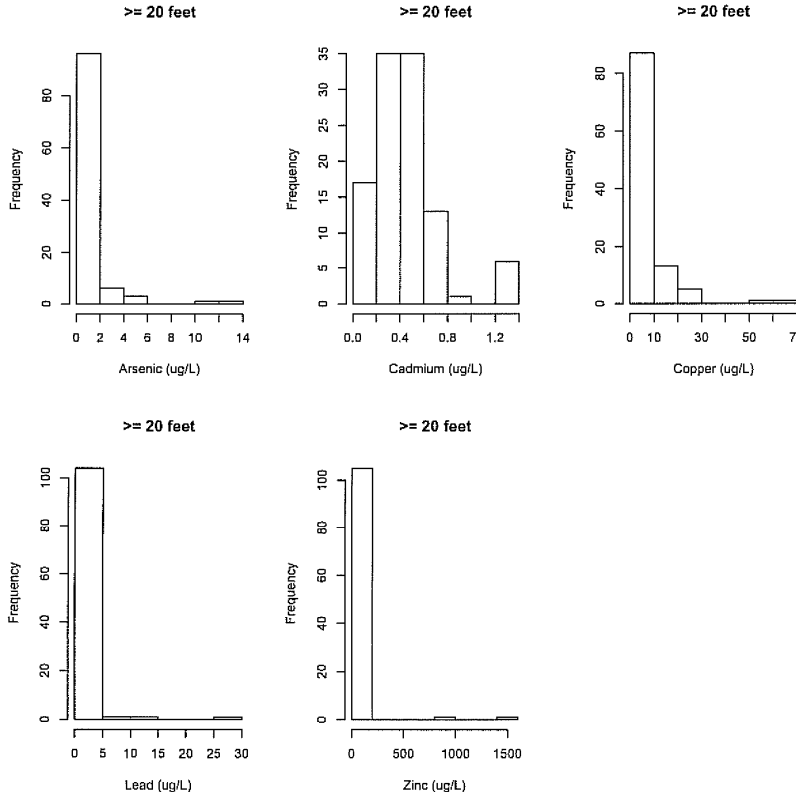

Figure 6. Histograms showing distributions for the original groundwater data (n = 107).

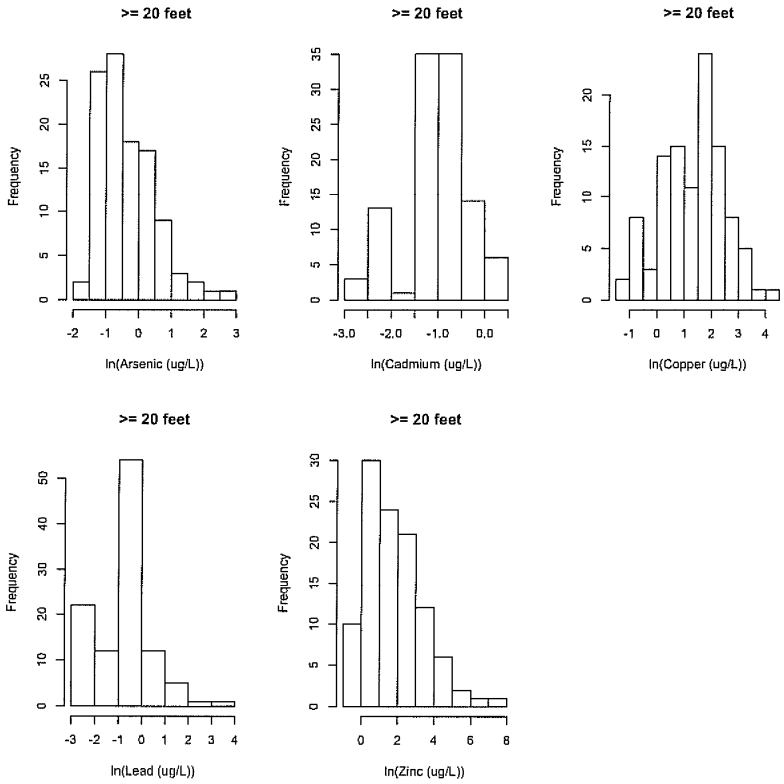

Figure 7. Histograms showing distributions for natural log transformed groundwater data *(n* = 107).

Table 4. Summary statistics, in µg/L, based on sample data collected at > 20 feet (*n* = 107).

Metal	Data	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	Std. Dev.
Arsenic	Original	0.206	0.351	0.515	1.134	1.220	13.800	1.790
	Natural log transformed	−1.580	−1.049	−0.664	−0.353	0.199	2.625	0.863
Cadmium	Original	0.050	0.250	0.500	0.432	0.500	1.250	0.287
	Natural log transformed	−2.996	−1.386	−0.693	−1.075	−0.693	0.223	0.736
Cooper	Original	0.250	1.652	4.640	6.856	8.205	63.30	9.275
	Natural log transformed	−1.386	0.485	1.535	1.309	2.105	4.148	1.157
Lead	Original	0.100	0.215	0.500	1.106	0.7355	30.000	3.195
	Natural log transformed	−2.303	−1.544	−0.693	−0.756	−0.308	3.401	1.117
Zinc	Original	0.500	2.405	5.340	37.670	14.000	1559.000	170.835
	Natural log transformed	−0.693	0.878	1.675	1.819	2.639	7.352	1.556

Confidence Interval Calculations

As for the soil data, two sets of confidence intervals were calculated using the metrics described in the soil section on page 8. The 99% and 95% confidence intervals are summarized in Tables 5 and 6, respectively.

Table 5. 99% confidence intervals in groundwater based on the geometric mean and the mean assuming a 102-normal distribution and based on samples collected from ≥ 20 feet.

	CI for the geometric mean (metric 1)		CI for the mean (metric 2)	
Metal	LL	UL	Metal	LL
Arsenic[1]	0.566	0.871	Arsenic[1]	0.566
Cadmium[2]	0.284	0.410	Cadmium[2]	0.284
Copper	2.775	4.937	Copper	2.775
Lead	0.355	0.620	Lead	0.355
Zinc[3]	4.189	9.089	Zinc[3]	4.189

[1] Sample median below lower bound for CI for geometric mean.

[2] Sample median above upper bound for CI for geometric mean.

[3] Sample mean just above upper bound of CI for the mean. Log-transformed sample data still show right-skew.

Table 6. 95% confidence intervals in groundwater based on the geometric mean and the mean assuming a log-normal distribution and based on samples collected from ≥ 20 feet.

	CI for the geometric mean (metric 1)		CI for the mean (metric 2)	
Metal	LL	UL	Metal	LL
Arsenic[1]	0.596	0.827	Arsenic[1]	0.596
Cadmium[2]	0.297	0.392	Cadmium[2]	0.297
Copper[3]	2.973	4.609	Copper[3]	2.973
Lead	0.380	0.580	Lead	0.380
Zinc[4]	4.593	8.284	Zinc[4]	4.593

[1] Sample median below lower bound for CI for geometric mean.

[2] Sample median above upper bound for CI for geometric mean.

[3] Sample median just above upper bound for CI for geometric mean.

[4] Sample mean above upper bound of CI for the mean. Log-transformed sample data still show right-skew.

[Community Soils OU ROD Amendment (Sept. 2013)]

RECORD OF DECISION AMENDMENT

COMMUNITY SOILS OPERABLE UNIT

Anaconda Smelter National Priorities List Site
Anaconda, Montana

SEPTEMBER 2013

U.S. Environmental Protection Agency and
Montana Department of Environmental Quality

Part I - Declaration

Site Name and Location

Anaconda Company Smelter Superfund Site (the Site), Anaconda-Deer Lodge County (ADLC), Montana 59711. EPA ID: MTD093291656. SSID: 0818. Community Soils Operable Unit (Community Soils OU).

Statement of Basis and Purpose

This document amends the 1996 record of decision (ROD) (EPA 1996) for the remedial action to clean up mining-related contamination at the Community Soils

OU. The amended remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and, to the extent practicable, the National Oil and Hazardous Substance Pollution Contingency Plan (NCP).

This document is issued by the EPA Region 8, the lead agency, and the Montana Department of Environment Quality (DEQ), the supporting agency. Both the EPA and DEQ concur on the selected remedy presented herein.

This ROD amendment is based on the administrative record for the Site and will become part of the administrative record per the NCP, Section 300.825(a)(2). The administrative record (on microfilm) and copies of key documents are available for public review at the joint Deer Lodge County/Arrowhead Foundation Superfund document Repository at 118 East Seventh Street in Anaconda. The complete written administrative record is maintained at the EPA-Montana Office, 10 West 15th Street, Suite 3200, in Helena, Montana and can be viewed during normal business hours.

Assessment of the Site

The Site is located in the Deer Lodge Valley in southwestern Montana, in and around the city of Anaconda. Milling and smelting activities conducted for nearly 100 years resulted in the contamination of soils, surface water, and ground water, primarily through airborne emissions and disposal practices from smelting operations. The primary contaminants of concern are arsenic, cadmium, copper, lead, and zinc. The remedial action selected in this ROD amendment is necessary to protect public health or welfare or the

environment from actual or threatened releases of hazardous substances at the Site.

Description of the ROD Amendment

The ROD amendment changes only those provisions of the 1996 Community Soils OU ROD which deal with residential soils. Remedial decisions for commercial/ industrial properties and active railroad beds remain unchanged. The amended remedy differs from the 1996 ROD with the addition of a cleanup level for lead in soils and cleanup levels for arsenic and lead in accessible interior dust, as well as the expansion of the institutional controls as implemented through the Community Protective Measures Program (CPMP) to provide for a health education program. All other components of the 1996 ROD remain unchanged.

Changes are due primarily to concentrations of lead in residential soils being significantly higher than those originally reported in the remedial investigation/ feasibility study (RI/FS). Additionally, there is also a better understanding of the site conceptual model based on the large amount of remedial action and other sample data collected since 1996. Although smelter emissions remain the primary source of contamination, it is now clear that some properties contain other sources of contamination (such as imported waste material).

Statutory Determinations

The selected remedy meets the mandates of CERCLA §121 and the NCP. It is protective of human health and the environment, complies with all federal and state requirements that are applicable or relevant and appropriate to the remedial action, is cost effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

The remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. However, contaminated soils present at the Community Soils OU do not represent a principal threat, and treatment would be significantly more expensive due to the very large quantities of materials impacted. Although they are present in large volumes, the soils within the Community Soils OU are low in toxicity and can be reliably contained.

Because this amended remedy will continue to result in mining contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure, statutory five-year reviews have been initiated at the Site and will continue to ensure that remedies remain protective of human health and the environment. The five-year reviews will continue to focus on areas where waste has been left in place or where remaining concentrations do not allow for unlimited use of the property.

Authorizing Signatures

This 2013 ROD Amendment documents the selected remedy for the Anaconda Smelter Community Soils OU. This remedy was selected by EPA with concurrence of the State of Montana.

/s/ Martin Hestmark

Martin Hestmark
Assistant Regional Administrator, Ecosystems Protection and Remediation
U.S. Environmental Protection Agency, Region 8

Date: 9/30/2013

/s/ Tracy Stone-Manning

Tracy Stone-Manning, Director
Montana Department of Environmental Quality

Date: September 27, 2013

[Anaconda Smelter Superfund Site
Fifth Five-Year Review (Sept. 25, 2015)]

Fifth Five-Year Review Report

Anaconda Smelter Superfund Site
Anaconda-Deer Lodge County, Montana

CERCLIS ID: MTD093291656

Prepared by:
U.S. Environmental Protection Agency Region 8
Helena, Montana

Approved By:

/s/ Martin Hestmark
Martin Hestmark
Assistant Regional Administrator
U.S. EPA, Region 8

Date:

9/25/15

Executive Summary

This report documents the fifth five-year review conducted by the U.S. Environmental Protection Agency (EPA), Region 8, for the Anaconda Smelter National Priorities List (NPL) site (the Site) in Deer Lodge County, Montana. The trigger for this review was the fourth five-year review completed in September 30,

2010. An addendum to the fourth five-year review was prepared in December 2013 based on additional information gathered and work completed in the 2010 to 2013 timeframe. This report evaluates and documents response actions designed, in place, or under construction at the Site and assesses whether or not the implemented actions are protective of human health and the environment. The Site Five-Year Review Summary form is included at the end of this Executive Summary.

Large scale smelting and concentrating operations were conducted at the Site for over 100 years. Smelter emissions dispersed contaminants elevated in arsenic and metals over more than 300 square miles. Large amounts of slag and tailings were also produced. Current estimated waste volumes at the Site include 230 million cubic yards (mcy) of tailings, 30 mcy of slag, and 500,000 cy of flue dust. Approximately 20,000 acres of soil were severely impacted by airborne emissions and millions of gallons of ground water were polluted. The milling and smelting contaminants pose well documented risks to human health and the environment.

The Site was placed on the NPL in 1983 and remedies were selected as documented by multiple records of decision (ROD) for the following five operable units (OUs):

- OU 15 Mill Creek - 1987;
- OU 11 Flue Dust - 1991;
- OU 7 Old Works/East Anaconda Development Area (OW/EADA) - 1994;
- OU 16 Community Soils – 1996 and 2013 (ROD Amendment), and;

- OU 4 Anaconda Regional Water, Waste & Soils (ARWW&S) – 1998 and 2011 (ROD Amendment).

To date, remedial action to address Site contaminants has been implemented on more than 340 residential properties and for more than 11,500 acres of open space. Remedial action is ongoing at OUs 7-OW/EADA, 16-Community soils and 4-ARWW&S. In addition, site-wide activities affecting all of the OUs, including final institutional controls (ICs), operations and maintenance (O&M), and ground and surface water remedies, are ongoing. Remedy protectiveness as determined during this five-year review is summarized below.

OU 15 Mill Creek

The remedy for the Mill Creek OU currently protects human health because former Mill Creek residents were permanently relocated from the site and soils were temporarily stabilized to limit fugitive dust. However, for the remedy to be protective in the long term, final soil remediation under ARWW&S OU RDU 6 South Opportunity Uplands must be implemented and the final Institutional Controls Implementation and Assurance Plan (ICIAP) must be completed and implemented (including long-term funding) at the NPL site.

OU 11 Flue Dust

The remedy for the Flue Dust OU currently protects human health and the environment because, the waste has been treated (stabilized) to below Toxicity Characteristic Leachate Procedure (TCLP) standards for arsenic, cadmium and lead, and has been encapsulated within a lined repository with access strictly controlled by fencing, gates, and security. However, for the remedy to remain protective in the long-term, corrective actions must be taken to eliminate seasonal ground water from

entering the repository and a leachate management plan must be completed and implemented to properly manage the leachate.

OU 7 OW/EADA

The remedy at OW/EADA OU is expected to be protective of human health and the environment upon completion of remaining remedial actions at the OU, including capping of the following parcels (McDowell, Kittleson, Warner and RDM), and access control of the Historic Structure Area. Additionally, a final ICIAP and final Golf Course O&M plan must be completed and implemented (including long-term funding). In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.

OU 16 Community Soils

The remedy for the Community Soils OU is not protective because exposure to lead contamination in residential soil and dust is not currently controlled. The following actions need to be taken (implementation of the 2015 Residential Soil/Dust Remedial Action Work Plan and completion and implementation (including long-term funding of the final ICIAP) to ensure protectiveness.

OU 4 ARWW&S

The remedy at the ARWW&S OU is expected to be protective of human health and the environment upon completion of the remaining remedial actions including soil reclamation and storm water controls for the RDUs (1, 2, 3, 6, 7, 9, 14, 15, and West Galen), and removal of tailings along Warm Springs Creek. Completion and implementation of either a re-use or closure plan for the remaining slag piles (Main Granulated

Slag, West Stack Slag, and landfill) must be completed and implemented. Additionally, the final ICIAP must be completed and implemented (including long-term funding) at the NPL site. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.

The 2015 Five-year Review identified seven issues regarding remediation and protectiveness. Table ES-1 presents the recommendations and follow-up actions for these issues and provides a milestone date for their resolution.

* * *

Section 3
Background

3.1 Location and Setting

The Site is located at the southern end of the Deer Lodge Valley. Figure 3-1 shows the location of the Site and its key features. The Site covers an area of approximately 300 square miles and consists of residential, commercial, agricultural (crops), pasture, rangeland, forests, riparian, and wetland areas which have been impacted by the release of smelter fallout and large volumes of ore-processing wastes such as flue dust, mill tailings, and furnace slag. The towns of Anaconda and Opportunity lie within the Site footprint. The Site is currently divided into five OUs, two of which (ARWW&S and OW/EADA) are further divided into smaller units to facilitate remedial design and action.

3.2 History of Contamination

In 1884 the Anaconda Copper Mining Company (ACM) and its predecessors commenced large copper concentrating and smelting operations at the area presently

known as the Old Works. Those facilities were located on the north side of Warm Springs Creek adjacent to the town of Anaconda and operated until about 1901. By 1902, ore processing and smelting operations had begun at the Washoe Reduction Works located on Smelter Hill, south of the Old Works and east of the town of Anaconda. That facility was also known as the Anaconda Smelter, the Washoe Smelter, the New Works, and the Anaconda Reduction Works. In 1977, the Atlantic Richfield Company (Atlantic Richfield) purchased ACM and expressly assumed its liabilities, as well as its assets. Operations at the Washoe Smelter ceased in 1980 and the smelter facilities were dismantled soon thereafter. The only substantial feature remaining from the Washoe Smelter facility is the 585-foot tall brick smelter stack.

The nearly 100 years of milling and smelting in Anaconda resulted in the dispersion of significant quantities of arsenic and metals (principally cadmium, copper, lead and zinc) into the environment over a large area. More than 300 square miles of land surrounding the smelter have been affected by operations at the Old Works and Washoe smelters. Estimated waste volumes at the Site include 230 million cubic yards of concentrated mill tailings, 30 million cubic yards of furnace slag, and 500,000 cubic yards of flue dust. In addition to the millions of cubic yards of these wastes, soils over more than 20,000 acres have been severely contaminated by airborne emissions and large portions of the local aquifers have been polluted via the leaching of contaminants from waste materials and the affected soil. These contaminants pose potential risks to human health, to aquatic life, and to the terrestrial flora and fauna. Arsenic is the primary contaminant of concern (COC) and drives the remedia-

tion for human health while copper and zinc are major concerns for plants and animals at the Site.

3.3 Regulatory History Summary

The Anaconda Smelter Site was placed on the NPL in September 1983 under the authority of CERCLA. Atlantic Richfield was identified as the principal potentially responsible party. EPA issued both general and special notice letters to Atlantic Richfield on several occasions and Atlantic Richfield has been actively involved in conducting investigations and performing response actions at the Site since that time. EPA is the lead agency and the Montana Department of Environmental Quality (DEQ) is the support agency for remedial actions being conducted at the Site. Because of the size of the former facilities, the hundred-years of industrial operation, the large volume of wastes, and the wide area of contamination, the Site has been divided into smaller, more manageable OUs, subareas, and remedial design units (RDUs) for purposes of remediation and long-term management.

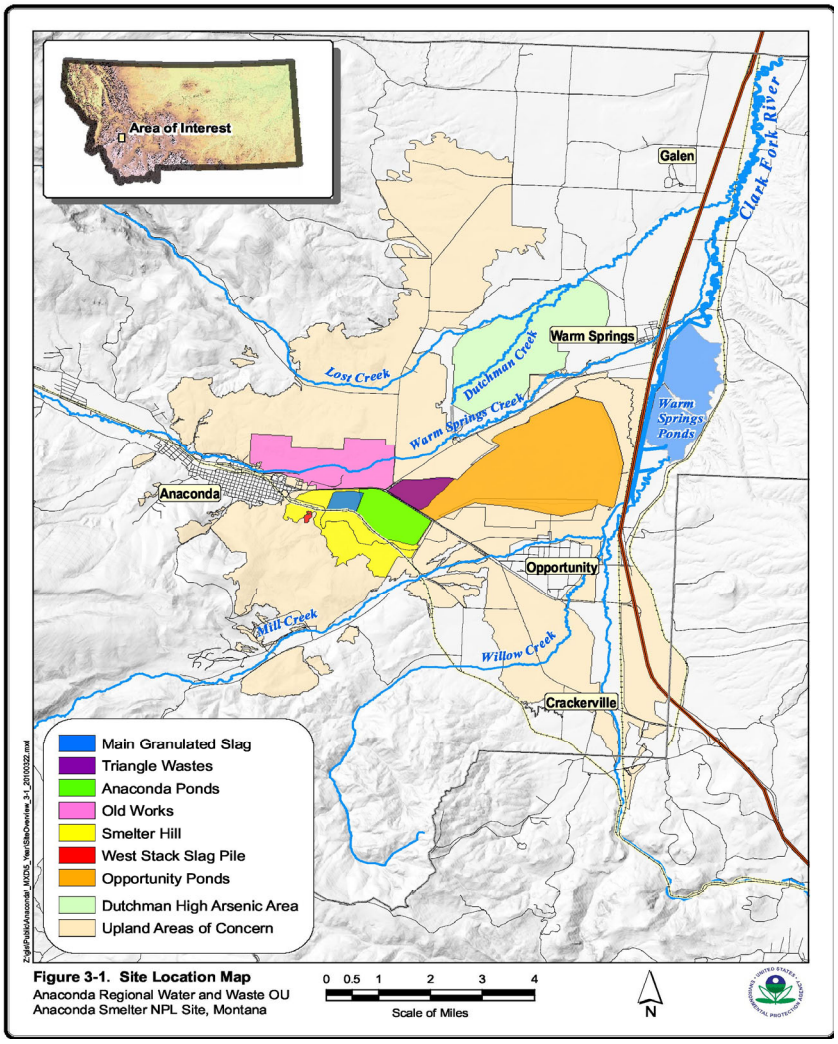

Figure 3-1. Site Location Map
Anaconda Regional Water and Waste OU
Anaconda Smelter NPL Site, Montana

[Supplemental Expert Disclosure of John R. Kane (May 2, 2016)]

KANE ENVIRONMENTAL INC.

May 2, 2016

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RE: Soil and Groundwater Sampling and Remediation Cost Estimate Opportunity and Crackerville, Montana

Gentlemen:

In March 2016, Kane Environmental, Inc. (Kane Environmental) completed soil sampling at one new property in Opportunity, Montana, and a round of groundwater sampling from existing wells in Opportunity and Crackerville, Montana. The soil and groundwater samples were delivered to Fremont Analytical Laboratory in Seattle, WA and data validation was completed by EcoChem of Seattle, WA. All soil and groundwater results were deemed usable by EcoChem. Groundwater samples were collected from a total of 32 previously installed wells. Five wells were not sampled due to access restrictions and in one case, the well was filled with dirt and not functional.

A total of ten (10) of the thirty-two (32) wells resulted in total arsenic concentrations above the Maximum Contaminant Level of 10 micrograms per liter (ug/L), or 31% of the total wells sampled. There was no correlation between high turbidity results, measured by NTUs, and elevated total arsenic concentrations. For example, groundwater from well OPP-SIL-MW-1 had a total arsenic concentration of 1.4 ug/L, and a NTU reading of 247, the highest NTU reading of all 32 wells sampled during the groundwater round. The lowest NTU reading from well CRA-GUS168-MW-1 had a total arsenic concentration of 11.9 ug/L. The highest total arsenic result from well OPP-RUS1010-MW-1 of 48.2 ug/L had a NTU reading of 54.3. The lowest total arsenic result from well OPP-SIM501-MW-1 of 0.282 ug/L had a NTU reading of 69.1. The groundwater well locations exceeding the arsenic MCL were located in proximity to and north of Highway 101, in the south-central and south-eastern portion of Opportunity. Groundwater wells exceeding the arsenic MCL were not localized in the Crackerville area.

In light of ARCO's recent cleanup proposals, subject to TCLP testing to be conducted during the remediation process, it is possible to dispose all of the contaminated soil in the Missoula County landfill, rather than Spokane. Of course, if ARCO agrees to allow the waste to be dumped in its local repository, that remains the most cost effective option.

ARCO's recent partial soil cleanup proposals intend to remove some of the soil that exceeds 250 ppm arsenic. While all of the soil in the upper 2 feet of the soil column remain contaminated, ARCO's remediation plan at least reduces the amount of soil that would be classified as a hazardous waste and, therefore, cannot be deposited in Montana county landfills.

A waste material has the characteristic of "toxicity" or "hazardous waste" if it is able to leach specific toxic metals, organic compounds, or pesticides into the soil or groundwater under landfill conditions. A special test called the toxicity characteristic leaching procedure (TCLP) is used to determine if a waste material will leach these chemicals into the soil or groundwater. The TCLP test is a leaching procedure completed at an analytical laboratory, that simulates conditions of wastes if they were to be disposed of in an ordinary sanitary landfill. The EPA regulates various chemicals and sets limits for what may be disposed of in a non-hazardous waste landfill, such as the county landfills in Silver-Bow, Missoula and Gallatin Counties, Montana.

If the concentration of a constituent is greater than the TCLP limit, the waste is a "toxicity characteristic" hazardous waste and may not be dumped in a sanitary landfill that is not equipped to accept hazardous waste. As the TCLP test is time consuming and costly, for planning purposes the "Rule of 20" is often used to determine whether waste material may be hazardous waste. In the TCLP testing procedure, the original test sample of a solid material is mixed or diluted with a volume of extraction fluid that equals 20 times the weight of the sample. A sample should weigh at least 100 grams. If all of a constituent in the sample completely dissolved or leached into the extraction fluid during the tumbling cycle of the TCLP procedure, then the concentration of the constituent in the extraction fluid will always be 20 times less than its original concentration in the sample, because it is diluted to 1/20th of its original concentration. For example, an original 100 gram soil sample contains a total concentration of 200 ppm lead. The soil sample is diluted with 20 times as much extraction fluid. The sample is tumbled

and filtered, and the extraction fluid is analyzed. If all of the lead in the sample dissolved in the extraction fluid, the concentration of lead in the extraction fluid would be 1/20 of 200 ppm or 10 ppm lead. This required 20:1 dilution ratio of the extraction fluid to the sample allows someone seeking to dispose of the waste to use the "Rule of 20" option to determine if a waste is hazardous.

To use the Rule of 20, the total concentration results can be divided by 20 and compared to the regulatory concentrations on the TCLP list. If the result is less than the TCLP regulatory limit (for each respective TCLP constituent of concern) then the waste is not a "toxicity characteristic" hazardous waste. Additionally, if the total concentration of a chemical is less than 20 times the TCLP regulatory limit, then the sample cannot leach enough of that constituent to fail the TCLP limit, even if all the chemical dissolved into the extraction fluid. This works because the total analysis represents the total amount of chemical present in the sample. If the total concentration is less than 20 times the TCLP regulatory limit of that constituent, then the sample could not leach enough of the chemical under TCLP conditions to fail the TCLP limit.

Metal	TCLP Limit (ug/L)	20 x TCLP Limit (ppm)
Arsenic	5.0	100
Cadmium	1.0	20
Lead	5.0	100

Therefore, it is generally accepted that if the total metals analysis results are equal to more than 20 times the TCLP limits the waste may be a hazardous waste and needs to be treated as such until a TCLP analysis confirms the waste's toxicity results.

In this case, the average level of arsenic in the soil to be extracted from Opportunity exceeds 100 ppm arsenic. The county landfills in Missoula, Butte-Silver Bow and Gallatin Counties cannot agree to accept the soil without further testing. Furthermore, Butte-Silver Bow and Gallatin County landfills cannot accept soil due to the volume limitations at each landfill, and for Gallatin County, permitting issues due to out-of-county disposal. Only Missoula County has sufficient volume to accept the waste at all and has indicated willingness to accept non-hazardous waste.

If ARCO does remove some of the soil exceeding 250 ppm, this will reduce the portion of contaminated soil in Opportunity considered a hazardous waste, which may not be dumped into a Montana County landfill. It will also reduce the amount of TCLP testing required for a county landfill to accept soil excavated from Opportunity. Representative samples of such soil may be sent for TCLP testing. If TCLP testing shows that representative samples of the soil exceeding 100 ppm leach less than 5 ppm arsenic and lead and less than 1 ppm cadmium into the extraction fluid, then the soil may be dumped in the Missoula County landfill at a lower cost than transporting soil to Spokane, WA. ARCO's removal of soil exceeding 250 ppm increases the likelihood of acceptance of the remainder of the soil by the Missoula County landfill, therefore this option must be considered.

As shown in the attached, Kane Environmental has revised the estimated soil tonnage to be excavated in light of ARCO's recent plan to remove contaminated soil on some of the Plaintiffs' properties. We have also updated the estimated soil tonnage to be excavated during the remediation based upon field observations, property owner information and review of aerial photo-

graphs, Kane Environmental decreased the amount of soil removal due to building design creating significant physical obstructions. For example, we are excluding buildings with slab-on-grade foundations where lifting the building from the foundation is not practical at this time. Based on these factors, as well as excluding properties that are no longer part of the litigation, an estimated total of 15,000 tons of soil is decreased from the original estimate.

Kane Environmental also revised the remediation cost estimate to include costs associated with project oversight, project cost accounting, temporary housing for residents where soil removal operations are on-going, and construction equipment storage, which were not include in the initial cost estimate. It is my understanding that the Plaintiffs have retained Thomas E. Copley to act as controller of funds recovered for the remediation efforts. Mr. Copley and his firm, Wipfli, will provide financial oversight and issue payments to contractors. Mr. Copley will also issue payments for the purchase or lease of real estate, equipment and storage that is necessary to complete the remediation. Mr. Copley will provide periodic accounting to a selected panel of Plaintiffs and will charge between $250 to $275/hour for his services.

A revised spreadsheet with updated costs is included as an attachment with this letter. In the spreadsheet, we have calculated costs of remediation assuming that all of the contaminated soil may be dumped locally in a repository owned by ARCO as one scenario. The updated total cost of this option is $38,295,763. We have also calculated the cost associated with transporting the contaminated soil to Missoula and Spokane. We assumed that at least 20% of the soil excavated will not be accepted by the Missoula County landfill

due to failure of the TCLP test. That portion will be sent to Spokane. Assuming that 80% of the soil may be deposited at the nearest available landfill in Missoula, the total cost of that option is $44,227,179.

Sincerely,

KANE ENVIRONMENTAL, INC.

/s/ John Kane
John Kane
CEO / President

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House:Crawl Space?	No. of Outbuildings	Outbuilding Notes & Additional Structure Information	House Area (sq. ft.)	Outbuilding Total Exclusion Area (sq. ft.)	Total Exclusion Area (sq. ft.)	Updated Excavation Area [=Total Sq Ft - Total Exclusion Area]	Total Exclusion Vol (assume 2 ft depth)
N	4	garage on slab-**estimate** based on aerial photos (480 SF) + conc pad (330 SF) + NNW shed on ground-**estimate** based on aerial photos (100 SF) NW shed-**estimate** based on aerial photos (168 SF) + N shed on slab-**estimate** based on aerial photos (550 SF)	846	1360	2206	74,024	4412
N	1	detached garage on slab (816 SF)	780	816	1596	20.184	3192
N	1	shed on ground-**estimate** based on aerial photos (135 SF)	912	--	760	64.580	1520
Y	1	garage on slab (1216 SF)	1425	1216	1216	14.901	2432
Y	1	garage on slab (1182 SF). shed on half concrete, half ground (1600 SF)	1565	2782	2782	238.540	5564
Y	0	no outbuildings	1742	--	0	152.460	0
N	1	garage (3501 SF) + shed (120 SF)	827	0	827	42.733	1654
N	2	garage (600 SF) + shed (120 SF)	1716	600	2316	42.115	4632
N	3	garage on slab (960 SF) + metal shed on ground (256 SF) + pole frame shed-1 side open (384 SF)	1144	960	2104	128.620	4208
Y	2	garage on slab (1040 SF) + shed on slab (200 SF)	1470	1240	1240	15.313	2480
N	0	only commercial structure/warehouse present	4570	--	4570	21.130	9140
N	2	garage on slab (30x30) + carport on ground (17x17)	1837	900	2737	45.615	5474
Y	2	garage on slab (33x28) + concrete patio (33x20) + 2 portable sheds	1350	1584	2934	17.104	5868
N	2	unfinished garage (252 SF) + shed (168 SF)	1116	252	1368	390.672	2736
N	1	unfinished garage on slab (680 SF)	2148	680	2828	40.732	5656
Y	1	garage on slab (25x29)	1300	725	725	39.350	1450
N	0	--	2750	--	2750	56.492	5500
N	0	attached garage on slab + partial driveway on slab + remaining house w/ basement	6525	--	6525	81.902	13050
Y	8	garage on slab (900 SF) + 7 sheds on ground	1456	900	900	56.599	1800
Y	2	septic reportedly adj to N of house + barn on ground (20x20) + garage on slab (15x20)	676	300	300	43.260	600
Y	4	shed on ground-**estimate** based on aerial photos (190 SF) + shed on ground-**estimate** based on aerial photos (125 SF) + shed on ground-**estimate** based on aerial photos (220 SF)	1440	0	1440	129,240	2880
N	1	garage on slab (576 SF)	1200	576	1776	35.860	3552
N	1	garage on slab (1700 SF on slab. 100 SF on ground)	2025	3725	3725	39.835	7450
Y-**estimate**	3	detached garage/shed (675 SF ground on slab, 675 SF shed on slab) + garage on slab (35x30) + conc pad (10x10) + shed on slab (45x30) + shed on slab (18X20) + shed on slab (320 SF)	2000	3855	3855	39,705	7710
N	2	2 storage sheds on slab (2 * (25x120))	--	6000	6000	72.844	12000
Y	4	detached garage partial on slab (960 SF). detached garage on ground (1630 SF) + several sheds on ground	1814	960	960	42.600	1920
--	--	--	--	--	--	--	--
Y	2	garage on slab (20x25) + store structure w crawl space (30x40)	1000	500	500	20.409	1000
Y	5	carport on slab (1800 SF) + garage on slab (1200 SF) + pole barn on slab (250 SF) + conc slab (270 SF) + several sheds on ground	3100	3520	3520	38.733	7040
N	3	garage on slab (3360 SF) + garage on slab (2835 SF) + shed on slab (144 SF)	1144	6339	7483	343.785	14966
Y	2	shed on slab (15x15) + shed on ground (25x25) + septic N of house	1980	225	225	43.335	450
Y	0	--	3375	--	3375	50.204	6750
--	--	no dwelling on property; see 10 N Hauser notes. parcel is part of 10 N Hauser property	--	--	--	--	--
Y	4	barn on slab (32x42) + shed on ground (15x12) + shed on ground (10x10) + shed on ground (10x10)	825	1344	1344	58.333	2688
Y	1	garage on slab (20x40). slab E of house (50x8) + septic W of house	1250	1200	1200	42.360	2400
Y	3	garage on slab (864 SF) + shed on ground (384 SF) + shed on ground (80 SF)	1466	864	864	52.279	1728
Y	1	garage on slab (35x30)	2500	1050	3550	33.476	7100
Y	5	outbuilding w crawl space (900 SF) + shed on slab (672 SF) + 3 sheds on ground + conc slab (370 SF)	2432	1042	1042	42.257	2084
Y	4	detached garage on slab (480 SF) + 3 sheds on redwood beams	1800	480	480	9.974	960
N	2	barn (30x30 - 600 SF on ground. 300 SF on slab) + portable sheds	2550	300	2850	40.710	5700
Y	1	small wooden shed (10x10) on S end of property. most likely portable	1600	0	0	43.560	0
Y	2	one garage (on slab) (468 SF) + outbuilding (on slab) (480 SF)	1210	948	948	26.930	1896
N	1	garage on slab-**estimate** based on aerial photos (1020 SF)	864	1020	1884	30.786	3768
Y	2	garage w crawl space (27x33) + portable shed (12x8) + septic W of house	1800	0	0	218.366	0
Y	5+	garage (on slab) (1800 SF) + multiple sheds most likely portable	896	1800	1800	50.036	3600
Y	--	house on 1008 Rickards St parcel. 1 associated southerly shed. most likely portable	2000	0	0	51.836	0
Y	1	metal barn on ground (48x27) + septic S of house	920	0	0	43.560	0
N	2	garage on slab (36x20) + shed on ground (50x20)	2700	720	3420	29.250	6840
Y	5	garage on wood beams. barn on ground. all sheds portable	2280	0	0	43.560	0
Y	1	shed on slab-**estimate** based on aerial photos (130 SF)	1232	130	130	43.430	260
N	1	playhouse (in SE corner) on slab (50 SF) + shed on ground (96 SF)	3400	50	3450	214.350	6900
Y	1	house- main part contains crawl space. L-shaped addition on slab: garage on slab (1400 SF)	2048	1400	3448	58.407	6896
N	1	garage on slab (400 SF)	1192	400	1592	38.614	3184
Y	4	add'l house (possibly 423 Stewart) with crawl space (1400 SF)-**estimate** based on aerial photos + 2 garages on slab (650 SF+990 SF)-**estimate** based on aerial photos + 2 sheds on ground-**estimate** based on aerial photos	1800	1640	1640	80,253	3280
--	--	possibly located on 420 Stewart parcel	--	--	--	--	--
N	2	garage on slab (672 SF) + shed on slab (185 SF)	1555	857	2412	20.239	4824
N	0	no structures	0	0	0	275.299	0
N	2	E shed on slab (30x30) + W shed on ground (60x35) + septic E of house	3500	900	4400	418.568	8800
Y	3	3 sheds. all portable	799	0	0	75.272	0
Y	1	garage on ground (530 SF)	0	0	0	53.579	0
Y	2	garage on slab (35x35)	2100	1225	1225	72.391	2450
Y	1	2 sheds on ground	1326	0	0	43.560	0
Y	1	garage on slab (1280 SF)	1689	1280	1280	20.500	2560
Y	2	shed in NW corner on ground (390 SF). garage on slab (900 SF)	1248	900	900	53.550	1800
Y	3	garage partially on slab (1400 SF) + addition (rear deck) with crawl space + storage shed on slab (845 SF)	2000	2245	2245	40.879	4490
Y	1	garage on slab (2700 SF) + shed on ground	2000	2700	2700	42.167	5400
Y	2	shed on concrete (350 SF) + concrete patio (130 SF) NOTE: Carol Krumske listed as owner on Montana Cadastral	1000	480	480	21.300	960
N	1	shed on slab-**estimate** based on aerial photos (330 SF)	1200	330	1530	22.428	3060
N	0	no outbuildings	852	852	852	53.598	1704
Y	2	garage on slab (1200 SF) + conc pad (400 SF) + shed on slab (120 SF)	2100	1720	1720	216.646	3440

ARCO ANACONDA
IRON FILINGS WALL GROUNDWATER RESTORATION
SURFACE SOIL EXCAVATION AND RESTORATION

Task 1 - Soil Excavation and Restoration

Excavator/Operator	400	days	$4,000		$1,600,000	2 excavators; 5 days/ week; 20 months
Soil Disposal Cost	574000	tons	$0		$0	Disposal at ARCO Anaconda
Soil Disposal Cost - Transportation	574000	tons	$12		$6,888,000	Disposal at ARCO Anaconda
Clean Fill Import	574000	tons	$1		$574,000	
Topsoil	37,000	yards	$1		$37,000	
Sod	6,022,000	sq ft	$0.20		$1,204,400	
SubTotal					**$10,303,400**	

Task 2 - Iron Filings Wall Installation

Excavator/Operator - Opportunity	80	days	$4,000		$320,000	2 excavators; 5 days/ week; 4 months
Excavator/Operator - Crackerville	40	days	$4,000		$160,000	2 excavators; 5 days/ week; 2 months
Soil Removal for Opportunity Wall	20000	tons	$0		$0	Disposal at ARCO Anaconda
Soil Removal for Crackerville Wall	10000	tons	$0		$0	Disposal at ARCO Anaconda
Soil Disposal Cost - Transportation	30000	tons	$12		$360,000	Disposal at ARCO Anaconda
Iron Filing Wall Installation - Opportunity	120000	vsf	$50		$6,000,000	vertical square feet (vsf) = 15 ft depth x 8000 ft length
Iron Filing Wall Installation - Crackerville	60000	vsf	$50		$3,000,000	vertical square feet (vsf) = 15 ft depth x 4000 ft length
Iron Filing Cost	180,000	vsf	$20		$3,600,000	
Subtotal					**$13,440,000**	
Pilot Test		lump sum	$500,000		$500,000	
Other Expenses						
Oversight Consultant	2,200	hours	$230		$506,000	36 months at 60 hrs/month
Trustee	720	hours	$275		$198,000	24 months at 30 hours/month
Groundwater well monitoring						
compliance well installation	12	wells	$2,000		$24,000	
analytical	20	samples	$50		$1,000	Bi annual 10 years
reporting	20	reports	$2,000		$40,000	
Temporary Relocation						
Motel and Expenses	20	months	$1,400	3	$84,000	20 months x $800/month x 3 rooms
Contractor Storage/Warehouse						
2 acres land					$75,000	
Warehouse construction					$100,000	
SubTotal					**$1,528,000**	

Contingency	20%	**$5,054,280**
Cost of Investigation and Development of Remediation Plan		$558,000
SubTotal Task 1, Task 2 and Contingency		**$30,883,680**
Engineering/Design/Management		
Project Management	5%	$1,544,184
Remedial Design	5%	$1,544,184
Construction Management	6%	$1,853,021
O&M Technical Support	8%	$2,470,694
SubTotal		**$7,412,083**
Estimated Total Project Cost =		**$38,295,763**

SPOKANE WASTE MANAGEMENT LANDFILL
IRON FILINGS WALL GROUNDWATER RESTORATION
SURFACE SOIL EXCAVATION AND RESTORATION

Task 1A - Soil Excavation and Restoration - Spokane

Excavator/Operator	80	days	$4,000	$320,000	
Soil Disposal Cost	115000	tons	$29	$3,335,000	Disposal at Spokane Waste Management
Soil Disposal Cost - Transportation	115000	tons	$45	$5,175,000	Disposal at Spokane Waste Management
Clean Fill Import	113000	tons	$1	$113,000	
SubTotal				**$8,943,000**	

Task 1B - Soil Excavation and Restoration - Missoula

Excavator/Operator	320	days	$4,000	$1,280,000	
Soil Disposal Cost	460000	tons	$29	$13,340,000	Disposal at Missoula landfill
Soil Disposal Cost - Transportation	460000	tons	$16	$7,360,000	Disposal at Missoula landfill
Clean Fill Import	458000	tons	$1	$458,000	
Topsoil	37,000	yards	$1	$37,000	Cost applicable to entire project
Sod	6,022,000	sq ft	$0.20	$1,204,400	Cost applicable to entire project
SubTotal				**$23,679,400**	

Task 2 - Iron Filings Wall Installation

Excavator/Operator - Opportunity	80	days	$4,000	$320,000	2 excavators; 5 days/ week; 4 months
Excavator/Operator - Crackerville	40	days	$4,000	$160,000	2 excavators; 5 days/ week; 2 months
Soil Removal for Opportunity Wall	20000	tons	$29	$290,000	Disposal at Missoula landfill
Soil Removal for Crackerville Wall	10000	tons	$29	$870,000	Disposal at Missoula landfill
Soil Disposal Cost - Transportation	30000	tons	$20	$600,000	Disposal at Missoula landfill
Iron Filing Wall Installation - Opportunity	120000	vsf	$50	$6,000,000	vertical square feet (vsf) = 15 ft depth x 8000 ft length
Iron Filing Wall Installation - Crackerville	60000	vsf	$50	$3,000,000	vertical square feet (vsf) = 15 ft depth x 4000 ft length
Iron Filing Cost	180,000	vsf	$20	$3,600,000	
Subtotal				**$14,840,000**	
Pilot Test		lump sum	$500,000	$500,000	

Other Expenses

Oversight Consultant	2,200	hours	$230		$506,000	36 months at 60 hrs/month
Trustee	720	hours	$275		$198,000	24 months at 30 hours/month
Groundwater well monitoring						
compliance well installation	12	wells	$2,000		$24,000	
analytical	20	samples	$50		$1,000	Bi annual 10 years
reporting	20	reports	$2,000		$40,000	
Temporary Relocation						
Motel and Expenses	20	months	$1,400	3	$84,000	20 months x $800/month x 3 rooms
Contractor Storage/Warehouse						
2 acres land					$75,000	
Warehouse construction					$100,000	
SubTotal					**$1,528,000**	
Contingency			20%		**$9,798,080**	
Cost of Investigation and Development of Remediation Plan					$558,000	
SubTotal Task 1A & 1B, Task 2 and Contingency					**$35,667,080**	
Engineering/Design/Management						
Project Management			5%		$1,783,354	
Remedial Design			5%		$1,783,354	
Construction Management			6%		$2,140,025	
O&M Technical Support			8%		$2,853,366	
SubTotal					**$8,560,099**	
			Estimated Total Project Cost =		**$44,227,179**	

Client Last Name	Client First Name	House Number	NSEW	Street	Acreage	Square Feet	House:Slab-on-Grade? Present	House:Basement?	House:Crawl Space?	No. of Outbuildings	Outbuilding Notes & Additional Structure Information	House Area (sq. ft.)	Outbuilding Total Exclusion Area (sq. ft.)	Total Exclusion Area (sq. ft.)	Updated Excavation Area [=Total Sq Ft - Total Exclusion Area]	Total Exclusion Vol (assume 2 ft depth)	Total Exclusion Vol (in tons)	Vol excavated by ARCO to not be included in exclusion (cubic yds)	Vol excavated by ARCO to not be included in exclusion (tons)	ARCO Excavation notes
Adams	Marilyn	805		Stewart St.	1.75	76,230	N	Y	N	4	garage on slab-**estimate** based on aerial photos (480 SF) + conc pad (330 SF) + NNW shed on ground-**estimate** based on aerial photos (100 SF) NW shed-**esimate** based on aerial photos (168 SF) + N shed on slab-**estimate** based on aerial photos (550 SF)	846	1360	2206	74,024	4412	245.1111111			
Choquette	Rosemary	115	North	Preston	0.5	21,780	Y	N	N	1	detached garage on slab (816 SF)	780	816	1596	20,184	3192	177.3333333	--	--	--
Christian	Gregory & Michelle	616	West	Rickards St.	1.5	65,340	N	Y	N	1	shed on ground-**estimate** based on aerial photos (135 SF)	912	--	760	64,580	1520	84.44444444	--	--	--
Colwell	Duane & Shirley	700	West	Rickards St.	0.37	16,117	N	N	Y	1	garage on slab (1216 SF)	1425	1216	1216	14,901	2432	135.1111111	0	0	*Lead* exceedance up to 6" Arsenic exceedances up to 12" - proposed excavation will extend to 2 feet bgs therefore ARCO excavation volume is
Cooney	Franklin and Vicki	500	South	Hauser St.	5.54	241,322	N	N	Y	1	garage on slab (1182 SF), shed on half concrete, half ground (1600 SF)	1565	2782	2782	238,540	5564	309.1111111	0	0	negligible
Coward	George & Shirley	107	North	Leslie St.	3.5	152,460	N	N	Y	0	no outbuildings	1742	--	0	152,460	0	0	--	--	--
Datres	Jack Jr.	421		Stewart St.	1	43,560	N	Y	N	1	garage (3501 SF) + shed (120 SF)	827	0	827	42,733	1654	91.88888889	--	--	--
Duffy	Viola	1311		Smith St. / Smith Ave.	1.02	44,431	Y	N	N	2	garage (600 SF) + shed (120 SF)	1716	600	2316	42,115	4632	257.3333333	--	--	--
Duxbury	Bruce & Joyce	120		Walter Rd. / Walter Dr.	3.001	130,724	N	Y	N	3	garage on slab (960 SF) + metal shed on ground (256 SF) + pole frame shed-1 side open (384 SF)	1144	960	2104	128,620	4208	233.7777778	--	--	-- Arsenic exceedance up to 2" - proposed excavation will extend to 2 feet bgs therefore ARCO excavation volume is
Field	Bill a/k/a William & Chris	1002		Smith St.	0.38	16,553	N	N	Y	2	garage on slab (1040 SF) + shed on slab (200 SF)	1470	1240	1240	15,313	2480	137.7777778	0	0	negligible
Field	Bill a/k/a William & Chris	918		Smith St.	0.59	25,700	Y	N	N	0	only commercial structure/warehouse present	4570	--	4570	21,130	9140	507.7777778	--	--	-- Arsenic exceedances up to 6" - proposed excavation will extend to 2 feet bgs therefore ARCO excavation volume is
Gress	James	160		ABC Drive / Montana Highway 1 East	1.11	48,352	N	Y	N	2	garage on slab (30x30) + carport on ground (17x17)	1837	900	2737	45,615	5474	304.1111111	0	0	negligible
Gustafson	Charles	168		Stackview Dr. / Crackerville Rd.	0.46	20,038	N	Y	Y	2	garage on slab (33x28) + concrete patio (33x20) + 2 portable sheds	1350	1584	2934	17,104	5868	326	--	--	--
Hamilton	Rick & Heather	107	South	Hauser	9	392,040	N	Y	N	2	unfinished garage (252 SF) + shed (168 SF)	1116	252	1368	390,672	2736	152	--	--	--
Hamilton	Rick & Heather	109	South	Hauser	1	43,560	N	Y	N	1	unfinished garage on slab (680 SF)	2148	680	2828	40,732	5656	314.2222222	--	--	--
Hendrickson	Michael	1201 (11027)		Rickards St.	0.92	40,075	N	N	Y	1	garage on slab (25x29)	1300	725	725	39,350	1450	80.55555556	--	--	--
Hoolahan	Shaun & Patrice	204	South	Leslie St.	1.36	59,242	Y	N	N	0	--	2750	--	2750	56,492	5500	305.5555556	--	--	-- Arsenic exceedances up to 2" - proposed excavation will extend to 2 feet bgs therefore ARCO excavation volume is
Hoolahan	Shaun & Patrice	801		Rickards St.	2.03	88,427	Y	Y	N	0	attached garage on slab + partial driveway on slab + remaining house w/ basement	6525	--	6525	81,902	13050	725	0	0	negligible Arsenic exceedance up to 2" - proposed excavation will extend to 2 feet bgs therefore ARCO excavation volume is
Jones	Ed & Ruth	7	North	Norris St.	1.32	57,499	N	N	Y	8	garage on slab (900 SF) + 7 sheds on ground	1456	900	900	56,599	1800	100	0	0	negligible
Kelsey	Barbara	214	North	Schuyler St.	1	43,560	N	N	Y	2	septic reportedly adj to N of house + barn on ground (20x20) + garage on slab (15x20)	676	300	300	43,260	600	33.33333333	0	0	*Lead* exceedance up to 6" Arsenic exceedance up to 18" - volume will not be included in total exclusion volume
Krattiger	Doug & Brenda	169		Ashleigh Lane	3	130,680	N	N	Y	4	shed on ground-**estimate** based on aerial photos (190 SF) + shed on ground-**estimate** based on aerial photos (125 SF) + shed on ground-**estimate** based on aerial photos (270 SF)	1440	0	1440	129,240	2880	160	3.5	0.194444444	
LaTray	Julie	618		Stewart St.	0.864	37,636	Y	N	N	1	garage on slab (576 SF)	1200	576	1776	35,860	3552	197.3333333	--	--	--
Mann	Leonard & Valerie	304	South	Hauser St.	1	43,560	Y	N	N	1	garage on slab (1700 SF on slab, 100 SF on ground)	2025	3725	3725	39,835	7450	413.8888889	--	--	--
McKay	Russ and Kristy	1464		Crackerville Rd.	1	43,560	N	N	Y-**estimate**	3	detached garage/shed (675 SF ground on slab, 675 SF shed on slab) + garage on slab (35x30) + conc pad (10x10) + shed on slab (45x30) + shed on slab (18X20) + shed on slab (320 SF)	2000	3855	3855	39,705	7710	428.3333333	--	--	--
Meyer	Bryce "Skip" & Mildred	206		Stewart St.	1.81	78,844	N	N	N	2	2 storage sheds on slab (2 * (25x120))	--	6000	6000	72,844	12000	666.6666667	--	--	--
Meyer	Bryce "Skip" & Mildred	218		Stewart St.	1	43,560	N	N	Y	4	detached garage partial on slab (960 SF), detached garage on ground (1630 SF) + several sheds on ground	1814	960	960	42,600	1920	106.6666667	--	--	--
Minnehan	Ted & Judy	806		Stewart St.	doesn't exist	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minnehan	Ted & Judy	808		Stewart St.	0.48	20,909	N	N	Y	2	garage on slab (20x25) + store structure w crawl space (30x40)	1000	500	500	20,409	1000	55.55555556	0	0	*Lead* exceedance up to 12"
Morse	Richard & Diane	116	North	Preston St.	0.97	42,253	N	N	Y	5	carport on slab (1800 SF) + garage on slab (1200 SF) + pole barn on slab (250 SF) + conc slab (270 SF) + several sheds on ground	3100	3520	3520	38,733	7040	391.1111111	0	0	*Lead* exceedance up to 2"
Mulcahy	Patrick & Karen	100		Mulcahy Rd.	8.064	351,268	N	Y	N	3	garage on slab (3360 SF) + garage on slab (2835 SF) + shed on slab (144 SF)	1144	6339	7483	343,785	14966	831.4444444	0	0	*Lead* exceedance up to 2" Arsenic exceedance up to 18" - volume will not be included in total exclusion volume
Myers	Serge & Nancy	10	North	Hauser St.	1	43,560	N	N	Y	2	shed on slab (15x15) + shed on ground (25x25) + septic N of house	1980	225	225	43,335	450	25	7	0.388888889	*Lead* exceedance
Myers	Serge & Nancy	6	South	Hauser St.	1.23	53,579	N	Y	Y	0	--	3375	--	3375	50,204	6750	375	0	0	up to 6"

Myers	Serge & Nancy	8 North	Hauser St.	1	43,560	--	--	--	--	no dwelling on property; see 10 N Hauser notes, parcel is part of 10 N Hauser property	--	--	--	--	--	--	0	0	Arsenic exceedance up to 6" + lead exceedance up to 18" - proposed excavation will extend to 2 feet bgs therefore ARCO excavation volume is negligible
Nelson	Ron & Leslie	522 (610?)	Stewart St.	1.37	59,677	N	N	Y	4	barn on slab (32x42) + shed on ground (15x12) + shed on ground (10x10) + shed on ground (10x10)	825	1344	1344	58,333	2688	149.3333333	--	--	--
Newell	John & Jane	10 North	Preston St.	1	43,560	N	N	Y	1	garage on slab (20x40), slab E of house (50x8) + septic W of house	1250	1200	1200	42,360	2400	133.3333333	--	--	--
Niland	George & Laurie	514	Rickards St.	1.22	53,143	N	N	Y	3	garage on slab (864 SF) + shed on ground (384 SF) + shed on ground (80 SF)	1456	864	864	52,279	1728	96	--	--	--
Ostrom	David & Rose	14 South	Leslie St.	0.85	37,026	N	Y	Y	1	garage on slab (35x30)	2500	1050	3550	33,476	7100	394.4444444	--	--	--
Peters	Donald (dec) & Judy	3 North	Norris St.	0.994	43,299	N	N	Y	5	outbuilding w crawl space (900 SF) + shed on slab (672 SF) + 3 sheds on ground + conc slab (370 SF)	2432	1042	1042	42,257	2084	115.7777778	--	--	--
Peters	Tammy	308 South	Hauser St.	0.24	10,454	N	N	Y	4	detached garage on slab (480 SF) + 3 sheds on redwood beams	1800	480	480	9,974	960	53.33333333	0	0	Arsenic exceedances up to 12" - proposed excavation will extend to 2 feet bgs, therefore ARCO excavation volume is negligible
Phillips	Robert & Antonettte	162	Ashleigh Lane / Ashleigh Road	1	43,560	N	Y	N	2	barn (30x30 - 600 SF on ground, 300 SF on slab) + portable sheds	2550	300	2850	40,710	5700	316.6666667	--	--	--
Powers	William & Carol	310	Stewart St.	1	43,560	N	N	Y	1	small wooden shed (10x10) on S end of property, most likely portable	1600	0	0	43,560	0	0	--	--	--
Raasakka	Gary	103 North	Preston St.	0.64	27,878	N	N	Y	2	one garage [on slab] (468 SF) + outbuilding [on slab] (480 SF)	1210	948	948	26,930	1896	105.3333333	--	--	--
Raasakka	Malissa	613	Stewart St.	0.75	32,670	Y	N	N	1	garage on slab-**estimate** based on aerial photos (1020 SF)	864	1020	1884	30,786	3768	209.3333333	--	--	--
Reid	Alex & Shelia fka Dorscher, Shelia	22	Mary Jane Drive / Crackerville Road	5.013	218,366	N	N	Y	2	garage w crawl space (27x33) + portable shed (12x8) + septic W of house	1800	0	0	218,366	0	0	--	--	--
Reisenauer, Kent	Kent	1008 East	Rickards St.	1.19	51,836	N	N	Y	5+	garage [on slab] (1800 SF) + multiple sheds most likely portable	896	1800	1800	50,036	3600	200	--	--	--
Reisenauer, Pete	Pete & Sue	1010	Rickards St.	1.19	51,836	N	N	Y	--	house on 1008 Rickards St parcel, 1 associated southerly shed, most likely portable	2000	0	0	51,836	0	0	12	0.666666667	Arsenic exceedance up to 18" - volume will not be included in total exclusion volume
Rupp	Larry	1144	Crackerville Rd.	1	43,560	N	N	Y	1	metal barn on ground (48x27) + septic S of house	920	0	0	43,560	0	0	--	--	--
Rusinski	John & Kathryn	1010	Crosby St. / Crosby Lane	0.75	32,670	Y	N	N	2	garage on slab (36x20) + shed on ground (50x20)	2700	720	3420	29,250	6840	380	--	--	--
Russ	Scott & Emily	3332	Crackerville Road	1	43,560	N	N	Y	5	garage on wood beams, barn on ground, all sheds portable	2280	0	0	43,560	0	0	0	0	*Lead* exceedance up to 2"
Ryan	Carl & Penny	302	Stewart St.	1	43,560	N	N	Y	1	shed on slab-**estimate** based on aerial photos (130 SF)	1232	130	130	43,430	260	14.44444444	--	--	--
Salle	Richard & Diane	273	Ashleigh Drive / Ashleigh Road	5	217,800	Y	N	N	1	playhouse (in SE corner) on slab (50 SF) + shed on ground (96 SF)	3400	50	3450	214,350	6900	383.3333333	--	--	--
Schafer	Dale	408	Stewart St.	1.42	61,855	Y	N	Y	1	house- main part contains crawl space, L-shaped addition on slab; garage on slab (1400 SF)	2048	1400	3448	58,407	6896	383.1111111	--	--	--
Schlosser	David & Ilona	1105	Stewart St.	0.923	40,206	N	Y	N	1	garage on slab (400 SF)	1192	400	1592	38,614	3184	176.8888889	0	0	Arsenic exceedance up to 2" - proposed excavation will extend to 2 feet bgs, therefore ARCO excavation volume is negligible
Sevalstad	Michael	420	Stewart St.	1.88	81,893	N	N	Y	4	addl'l house (possibly 423 Stewart) with crawl space (1400 SF)-**estimate** based on aerial photos + 2 garages on slab (650 SF+990 SF)-**estimate** based on aerial photos + 2 sheds on ground-**estimate** based on aerial photos	1800	1640	1640	80,253	3280	182.2222222	--	--	--
Sevalstad	Michael	423	Stewart St.	--	--	--	--	--	--	possibly located on 420 Stewart parcel	--	--	--	--	--	--	--	--	--
Shafford	Jim	1112	Rickards St.	0.52	22,651	Y	N	N	2	garage on slab (672 SF) + shed on slab (185 SF)	1555	857	2412	20,239	4824	268	--	--	--
Silzly	Richard (dec) & Rosemarie	503 South	Hauser St.	6.32	275,299	N	N	N	0	no structures	0	0	0	275,299	0	0	--	--	--
Silzly	Richard (dec) & Rosemarie	9 South	Hauser St.	9.71	422,968	Y	Y	N	2	E shed on slab (30x30) + W shed on ground (60x35) + septic E of house	3500	900	4400	418,568	8800	488.8888889	--	--	--
Simon	Steve	501 South	Hauser St.	1.728	75,272	N	N	Y	3	3 sheds, all portable	799	0	0	75,272	0	0	--	--	--
Solan	Anthony	NA East	Stewart St.	1.23	53,579	N	N	Y	1	garage on ground (530 SF)	0	0	0	53,579	0	0	--	--	--
Sorum	Kevin	600 South	Sidney	1.69	73,616	N	N	Y	2	garage on slab (35x35)	2100	1225	1225	72,391	2450	136.1111111	--	--	--
Sparks	Don	802	Stewart St.	1	43,560	N	N	Y	1	2 sheds on ground	1326	0	0	43,560	0	0	--	--	--
Spehar	Zane & Vickie	101 North	Preston St.	0.5	21,780	N	N	Y	1	garage on slab (1280 SF)	1689	1280	1280	20,500	2560	142.2222222	--	--	--
Svendsen-James, Jr.	James, Jr. & Cara	319	Ayers St.	1.25	54,450	N	N	Y	2	shed in NW corner on ground (390 SF), garage on slab (900 SF)	1248	900	900	53,550	1800	100	--	--	--
Svendsen-James, Sr.	James, Sr. & Caron	1019	Crosby St.	0.99	43,124	N	N	Y	3	garage partially on slab (1400 SF) + addition (near deck) with crawl space + storage shed on slab (845 SF)	2000	2245	2245	40,879	4490	249.4444444	0	0	*Lead* exceedance up to 6" Arsenic exceedances up to 6" - proposed excavation will extend to 2 feet bgs, therefore ARCO excavation volume is negligible
Violette-Doug	Doug	11 North	Norris St.	1.03	44,867	N	N	Y	1	garage on slab (2700 SF) + shed on ground	2000	2700	2700	42,167	5400	300	0	0	--
Walrod	Charles (Jim) & Carol	709	Stewart St.	0.5	21,780	N	N	Y	2	shed on concrete (350 SF) + concrete patio (130 SF) NOTE: Carol Krumske listed as owner on Montana Cadastral	1000	480	480	21,300	960	53.33333333	--	--	--
Willey	Darlene	12 North	White	0.55	23,958	N	Y	N	1	shed on slab-**estimate** based on aerial photos (330 SF)	1200	330	1530	22,428	3060	170	--	--	--
Yates	Ken & Sharon	9	Stewart St.	1.25	54,450	N	Y	N	0	no outbuildings	852	852	852	53,598	1704	94.66666667	--	--	--
Zimmer	David & Toni	75	Ashleigh Rd. / Ashleigh Dr.	5.013	218,366	**N**	**N**	**Y**	2	garage on slab (1200 SF) + conc pad (400 SF) + shed on slab (120 SF)	2100	1720	1720	216,646	3440	191.1111111	0	0	Arsenic exceedances up to 2" - proposed excavation will extend to 2 feet bgs, therefore ARCO excavation volume is negligible

red = added from 04/14/2016 list

NOTE:
-19 S Hauser not included in 04/14 list- contains lead exceedance up to 6"
-1006 E Stewart St not included in 04/14 list- contains lead exceedance up to 6"

Estimated Volume Calculations	
Total Area of All Properties (acre):	121
Excavation Depth (feet):	2
Total Excavation Volume (Acre-feet):	242.96
Total Excavation Volume (Cubic feet):	10,583,337.60
Total Excavation Volume (Cubic yards):	391,975.47
Total Excavation Volume (tons):	**587,963.20**
Total Exclusion Volume (tons):	**13,658.78**
Updated Exclusion Total [Exclusion Vol - Vol Excavated by ARCO] (tons):	**13,657.53**
Updated Total Excavation Vol [Total Excavation Vol - Updated Exclusion Total] (tons):	**574,305.67**

[Supplemental Expert Disclosure of John R. Kane (Sept. 14, 2016)]

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Attorneys for Plaintiffs

MONTANA SECOND JUDICIAL DISTRICT COURT
SILVER BOW COUNTY

———

Cause No. DV-08-173

———

GREGORY A. CHRISTIAN; *et al.*,

Plaintiffs,

v.

ATLANTIC RICHFIELD COMPANY,

Defendant.

———

PLAINTIFFS' SUPPLEMENTAL EXPERT WITNESS DISCLOSURE

———

Plaintiffs hereby supplement their prior expert disclosures as follows:

1. William Joel Meggs, MD, PhD, FACEP, FACMT
   103 Hidden Hills Drive
   Greenville, NC 27858
   Tel: (252) 355-7335
   Email: meggsw@ecu.edu

The subject matter, facts and opinions, and basis for such opinions are supplemented as set forth in Dr. Meggs's deposition of September 8, 2016, taken by Defendant ARCO.

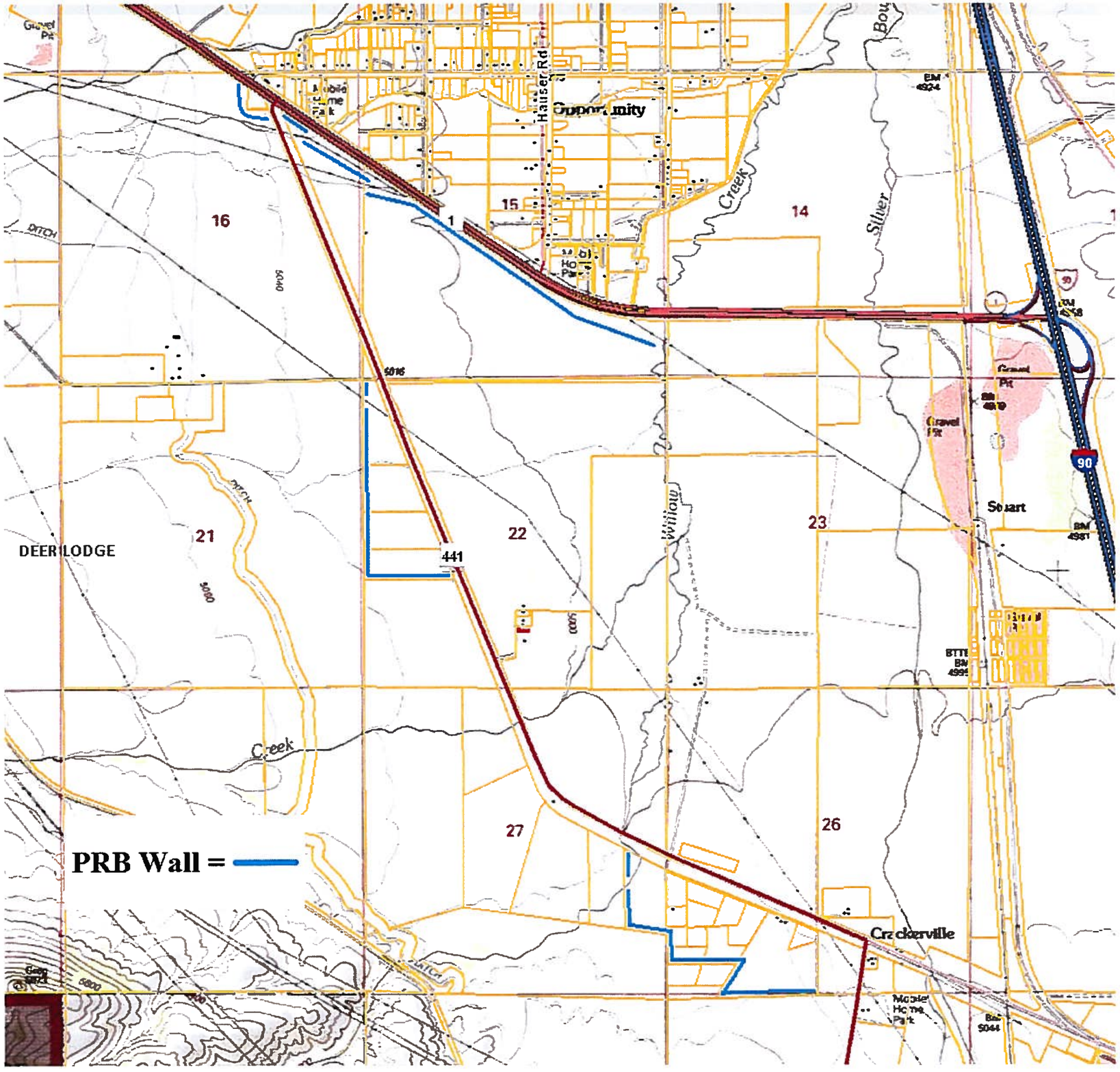
3. John Kane, L.G., L.H.G.
   CEO/President
   KANE ENVIRONMENTAL, INC.
   3815 Woodland Park Avenue North, Suite 102
   Seattle, WA 98103
   Tel: (206) 691-0476
   Email: jkane@kane-environmental.com

Attached are updated costs and locations for the PRB walls discussed in Mr. Kane's previous reports. Included within the updated cost spreadsheet is the cost of an easement ($100,000) to be purchased from Mr. Rod Kline, who owns property upon which Plaintiffs intend to place a PRB wall.

DATED this 14th day of September 2016.

SUBMITTED BY:

/s/ Justin P. Stalpes
Jusin P. Stalpes
BECK, AMSDEN & STALPES, PLLC


PRB Wall =
DEER LODGE
Opportunity
Stuart
Crackerville
Silver Creek
Willow Creek
Hauser Rd
441
90
16
15
14
21
22
23
27
26

ARCO ANACONDA
IRON FILINGS WALL GROUNDWATER RESTORATION
SURFACE SOIL EXCAVATION AND RESTORATION

Task 1 - Soil Excavation and Restoration

Excavator/Operator	400	days	$4,000		$1,600,000	2 excavators; 5 days/ week; 20 months
Soil Disposal Cost	574000	tons	$0		$0	Disposal at ARCO Anaconda
Soil Disposal Cost - Transportation	574000	tons	$12		$6,888,000	Disposal at ARCO Anaconda (includes clean fill back haul from Rocker
Clean Fill Import	574000	tons	$1		$574,000	
Topsoil	37,000	yards	$1		$37,000	
Sod	6,022,000	sq ft	$0.20		$1,204,400	
SubTotal					**$10,303,400**	

Task 2 - Iron Filings Wall Installation

Excavator/Operator - Opportunity	80	days	$4,000		$320,000	2 excavators; 5 days/ week; 4 months
Excavator/Operator - Crackerville	100	days	$4,000		$400,000	2 excavators; 5 days/ week; 6 months
Soil Removal for Opportunity Wall	20000	tons	$0		$0	Disposal at ARCO Anaconda
Soil Removal for Crackerville Wall	27000	tons	$0		$0	Disposal at ARCO Anaconda
Soil Disposal Cost - Transportation	47000	tons	$12		$564,000	Disposal at ARCO Anaconda (includes clean fill back haul from Rocker
Iron Filing Wall Installation - Opportunity	120000	vsf	$50		$6,000,000	vertical square feet (vsf) = 15 ft depth x 8000 ft length
Iron Filing Wall Installation - Crackerville	165000	vsf	$50		$8,250,000	vertical square feet (vsf) = 15 ft depth x 11,000 ft length
Iron Filing Cost	285,000	vsf	$20		$5,700,000	
Subtotal					**$21,234,000**	
Pilot Test		lump sum	$500,000		$500,000	
Other Expenses						
Oversight Consultant	2,200	hours	$230		$506,000	36 months at 60 hrs/month
Trustee	720	hours	$275		$198,000	24 months at 30 hours/month
Groundwater well monitoring						
compliance well installation	12	wells	$2,000		$24,000	
analytical	20	samples	$50		$1,000	Bi annual 10 years
reporting	20	reports	$2,000		$40,000	
Temporary Relocation						
Motel and Expenses	20	months	$1,400	3	$84,000	20 months x $800/month x 3 rooms
Contractor Storage/Warehouse						
2 acres land					$75,000	
Warehouse construction					$100,000	
Access Fee for Opportunity PRB					$100,000	
SubTotal					**$1,628,000**	
Contingency			20%		**$6,633,080**	
Cost of Investigation and Development of Remediation Plan					$558,000	
SubTotal Task 1, Task 2 and Contingency					**$40,356,480**	
Engineering/Design/Management						
Project Management			5%		$2,017,824	
Remedial Design			5%		$2,017,824	
Construction Management			6%		$2,421,389	
O&M Technical Support			8%		$3,228,518	
SubTotal					**$9,686,555**	
			Estimated Total Project Cost =		**$50,042,035**	

SPOKANE WASTE MANAGEMENT LANDFILL
IRON FILINGS WALL GROUNDWATER RESTORATION
SURFACE SOIL EXCAVATION AND RESTORATION

Task 1A - Soil Excavation and Restoration - Spokane

Excavator/Operator	80	days	$4,000	$320,000	
Soil Disposal Cost	115000	tons	$29	$3,335,000	Disposal at Spokane Waste Management
Soil Disposal Cost - Transportation	115000	tons	$45	$5,175,000	Disposal at Spokane Waste Management
Clean Fill Import	113000	tons	$1	$113,000	
SubTotal				**$8,943,000**	

Task 1B - Soil Excavation and Restoration - Missoula

Excavator/Operator	320	days	$4,000	$1,280,000	
Soil Disposal Cost	460000	tons	$29	$13,340,000	Disposal at Missoula landfill
Soil Disposal Cost - Transportation	460000	tons	$16	$7,360,000	Disposal at Missoula landfill
Clean Fill Import	458000	tons	$1	$458,000	
Topsoil	37,000	yards	$1	$37 000	Cost applicable to entire project
Sod	6,022 000	sq ft	$0 20	$1 204,400	Cost applicable to entire project
SubTotal				**$23,679,400**	

Task 2 - Iron Filings Wall Installation

Excavator/Operator - Opportunity	80	days	$4,000	$320,000	2 excavators, 5 days/ week, 4 months
Excavator Operator Crackerville	100	days	$4 000	$400,000	2 excavators, 5 days/ week, 6 months
Soil Removal for Opportunity Wall	20000	tons	$29	$783,000	Disposal at Missoula landfill
Soil Removal for Crackerville Wall	27000	tons	$29	$1,363,000	Disposal at Missoula landfill
Soil Disposal Cost Transportation	47000	tons	$20	$940,000	Disposal at Missoula landfill
Iron Filing Wall Installation - Opportunity	120000	vsf	$50	$6,000,000	vertical square feet (vsf) = 15 ft depth x 8000 ft length
Iron Filing Wall Installation - Crackerville	165000	vsf	$50	$8,250,000	vertical square feet (vsf) = 15 ft depth x 4000 ft length
Iron Filing Cost	285,000	vsf	$20	$5,700,000	
Subtotal				**$23,756,000**	
Pilot Test		lump sum	$500,000	$500,000	
Other Expenses					
Oversight Consultant	2,200	hours	$230	$506,000	36 months at 60 hrs/month
Trustee	720	hours	$275	$198,000	24 months at 30 hours/month
Groundwater well monitoring					
compliance well installation	12	wells	$2,000	$24,000	
analytical	20	samples	$50	$1,000	Bi annual 10 years
reporting	20	reports	$2,000	$40,000	
Temporary Relocation					
Motel and Expenses		months	$1,400	$84,000	20 months x $800/month x 3 rooms
Contractor Storage/Warehouse					
2 acres land				$75,000	
Warehouse construction				$100,000	
Access Fee for Opportunity PRB				$100,000	
SubTotal				**$1,628,000**	
Contingency				**$11,601,280**	
Cost of Investigation and Development of Remediation Plan				$558,000	
SubTotal Task 1A & 1B, Task 2 and Contingency				**$46,486,280**	
Engineering/Design/Management					
Project Management			5%	$2,324,314	
Remedial Design			5%	$2,324,314	
Construction Management			6%	$2,789,177	
O&M Techn cal Support			8%	$3,718,902	
SubTotal				**$11,156,707**	
			Estimated Total Project Cost =	**$57,642,987**	

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[Transcript of Hearing on Motions for Summary Judgment (June 20, 2016)]

* * *

[172] about is shallow groundwater that none of them are currently using for any purpose.

MR. KOVACICH: Your Honor, can I respond? They're making characterizations about what we argued here, and it's not accurate. We absolutely take the position that the contamination on our clients' property presents a health risk. We have not made an injury claim for anyone. We do have expert testimony from two toxicologists who will both testify that the levels of arsenic they want to leave on these properties present a health risk.

And, again, this is something that we argued in the Montana Supreme Court. They stood in that courtroom and told – said the same thing to the judges on the Montana Supreme Court, that we don't even argue that there's a health risk here. All anyone has to do is look at our expert disclosures and read what our witnesses are going to testify to. And they are going to testify that this presents a health risk.

And the Supreme Court, in determining that reasonable abatability is a question of fact for the jury, noted that there's a dispute as to the seriousness of this contamination. That's a question for the jury.

THE COURT: Anything more?

MR. CHAMPOUX: No, Your Honor. I guess one [173] other point that we should make to the – while we're on the topic of the CERCLA levels of cleanup – and this has been mentioned this morning. But any of the properties that are above, that have some segments of the property that are above the 250 parts

per million cleanup standard are being cleaned up. Those cleanups are ongoing as we speak, and those will be completed this summer. So by the time we're in trial there will be no properties that have tested above the EPA cleanup standards that are still needing cleanup, if all goes according to plan and if the parties are able to cooperate on all of those cleanups.

THE COURT: Okay. I'll take the matters under advisement and get a decision to you as quickly as I can. Safe travels.

MR. STALPES: Thank you.

MR. RAUCHWAY: Thank you, Your Honor.

THE COURT: Thanks for coming here.

(Whereupon, the proceedings were concluded.)