

**Explanation of Significant Differences
Comments and Responsiveness Summary**

**Montana Pole Treatment Plant Site
Butte,
Silver Bow County, Montana
November 2020**

Prepared By:

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Helena, Montana
in consultation with U.S. Environmental Protection
Agency
Region 8
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**TABLE 1
TOPICS AND COMMENTS**

		2020 Draft ESD		2016 Fourth Five-Year Review
Topic	Topic Page #	Comment ID	<i>Duplicate comment ID</i>	Comment ID
Air Quality	6	A10	Q10	
		I1		
Agency Accountability and Rules	8	E4	V.1-12	
		E6		
		J2		
		J3		
		V.1-9		
		V.1-20		
		V.1-22	J1	
Biological Treatment	15	K1		
		K4 (See Appendix B)		D45, F4, M3, O21
Cleanup and Cleanup Levels	16	A11	Q11	
		E2	V.1-10	
		G2 (See Appendix B)	V.2-2	D9
		S4		
		S6		
		S7		
		S8		
		S11		
		S12		
		T5		
		T6		
		T9		
Community Involvement	25	A9	Q9	
		N2		
		N2.2		
		V.1-8		
Dioxin (and other COCs)	26	E5 (See Appendix B)	V.5-1	D46, D48, D49, M4, M7, O22, O23
		G1 (See Appendix B)	V.2-1	D8, J7
		G8 (See Appendix B)	H1, J4, K8, V.1-13, V.1-23, V.2-8, V.3-1	B3, B4, B5, B6, B7, D16 - D24, D68, D27, D56, F15, F22, I13, M15, M23, O31, R5 – R12

		2020 Draft ESD		2016 Fourth Five-Year Review
Topic	Topic Page #	Comment ID	Duplicate comment ID	Comment ID
Dioxin (and other COCs)	26	G10	V.2-10	
		G12 (See Appendix B)	K5, V.2-12	F7
		G13 (See Appendix B)	K6, V.2-13	D26, D50, D51, D67, F8, F9, F21, M8, M9, M10, M22, O7, O24, O26
		G16 (See Appendix B)	V.2-16	D26, I3, I4, I5
		J5 (See Appendix B)	V.1-24	G2, K2
		J6	V.1-25	
		S10		
		T10		
		V1		
		V.1-11		
		V.1-14		
		V.4-1		
ESD Formatting	31	S5		
		T8		
Five -Year Review	33	G6 (See Appendix B)	V.2-6	D13, D14
		G15 (See Appendix B)	V.2-15	D62
		L1		
Funding	35	A1	Q1	
		A8	Q8	
		J8	V.1-27	
		J10	V.1-29	
		S3		
		S13		
		V.1-2		
		V.1-6		
V.1-21				
Remedy - Capping	38	A4	Q4	
		D1 (See Appendix B)	H3, V.1-15, V.3-3, V.7-1	D63, I14, I15, K2, O2
		E3	V.1-12	
		G3 (See Appendix B)	V.2-3	D10
		G14 (See Appendix B)	K7, V.2-14	D54, F13, J9, M13, O29
		H2 (See Appendix B)	V.3-2	G2, K2

		2020 Draft ESD		2016 Fourth Five-Year Review
Topic	Topic Page #	Comment ID	<i>Duplicate comment ID</i>	Comment ID
Remedy - Capping	38	H4 (See Appendix B)	V.3-4	K2
		J7	V.1-26	
		K3 (See Appendix B)		D44, F3, M2
		M1		
		N1		
		O1		
		P1		
		P2		
		S9		
		T1		
		T3		
		T4		
		V.1-1		
Remedy – Institutional Controls	45	A7	Q7	
		D2 (See Appendix B)	V.1-16, V.7-2	D64, L1, N2
		D3 (See Appendix B)	V.1-19, V.7-3	D64, L1, N2
		D4 (See Appendix B)	H10, V.3-10, V.7-4	G3, K4
		D5 (See Appendix B)	H10, V.7-5	G3, K4
		D6 (See Appendix B)	H6, V.3-6, V.7-6	D64, G3, K3, N2
		D7 (See Appendix B)	V.7-7	G3, K3
		D8 (See Appendix B)	H7, V.3-7, V.7-8	G3, K3
		D9 (See Appendix B)	H8, V.3-8, V.7-9	G3, K3
		D10 (See Appendix B)	H8, V.3-8, V.7-10	G3, K3
		D11 (See Appendix B)	H9, V.3-9, V.7-11	G3, K4
		G4 (See Appendix B)	V.2-4	D11
		H5 (See Appendix B)	V.3-5	D64
		H11 (See Appendix B)	V.3-11	G3, K3
		V.1-18 (See Appendix B)		G3, K4

		2020 Draft ESD		2016 Fourth Five-Year Review
Topic	Topic Page #	Comment ID	<i>Duplicate comment ID</i>	Comment ID
Remedy – Thermal Soil Remediation	46	U1		
Remediation Under the Interstate	46	A3	Q3	
		V.1-5		
Reuse of the Site	47	A5	Q5	
		B1		
		F1		
		F2		
		G7 (See Appendix B)	V.2-7	D15
		G17 (See Appendix B)	V.2-17	I7, I8
		J9	V.1-28	
		V.1-4		
Risk Assessment	48	C2		
ROD Amendment	49	S1		
		S2		
Storm Water and Erosion	51	A6	Q6	
		G5 (See Appendix B)	V.2-5	D12
		G11 (See Appendix B)	V.2-11	D43, R13
		J8	V.1-27	
		V.1-7		
Tree Mortality	52	C1		

2020 Draft ESD				2016 Fourth Five-Year Review
Topic	Topic Page #	Comment ID	<i>Duplicate comment ID</i>	Comment ID
Water Treatment Plant	53	R1		
Water Quality	53	A2	<i>Q2</i>	
		E1	V.1-10	
		G9 (See Appendix B)	V.2-9	D28, D56, D69, F23, O9, O23
		K2		
		T2		
		T7		
		V.1-3		

The Montana Department of Environmental Quality (DEQ) held a public comment period from February 10 to March 10, 2020 for the proposed changes to the original cleanup plan at the Montana Pole & Treating Plant (MT Pole). The following comments were submitted to the 2020 Draft Explanation of Significant Differences (ESD). Some comments were submitted verbatim more than once during the public comment period; therefore, these comments have been consolidated and are referred to as “duplicate comments”. All comments received during the public comment period are provided in full in Appendix A. Comments submitted to the *Fourth Five-Year Review* (Tetra Tech, April 2017), as well as the 2020 Draft ESD, are referenced in the above table and addressed in Appendix B. In this responsiveness summary, similar comments are grouped together, summarized, and answered overall, with specific responses to comments as needed.

AIR QUALITY

COMMENT SUMMARY

Two original comments were received regarding Air Quality. Both comments are regarding odor (A10, I1). One comment was submitted twice. This comment is referred to as “duplicate comment” in the table below and italicized and within parentheses within the text at the beginning of the comment presentation. For the comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Air Quality			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
A10	Q10		X
I1			X

COMMENTS SPECIFIC TO ODOR

- **Comment A10 (Q10).** “Given the remediation protocol outlined in the ESD, odors emanating from the Pole Plant could again become an issue. What will MDEQ do to mitigate the effects of odors emanating from the Pole Plant?”
- **Comment I1.** “Activity pursuant to the proposed ESD for Montana Pole Plant will probably recreate the odor problem of a number of years back. These odors were harmful to sensitive individuals in and of themselves and not just as indicators of underlying pollution. Extensive documentation in the literature exists that odors can in and of themselves be harmful to human health. Human health effects were certainly felt by sensitive residents near the Pole Plant in the past as a result of remediation activity at the Plant. I would like to raise the following issues/concerns that I would like addressed pursuant to the public comment period for Montana Pole Plant:”
 - “1. Will the remediation activity pursuant to the ESD likely create an odor problem for nearby residents of the Montana Pole Plant?”
 - “2. If so, what steps will MDEQ take to mitigate this problem, hopefully before it becomes a threat to human health of sensitive individuals?”
 - “3. What steps will MDEQ take to inform residents that odors will again be an issue pursuant to the implementation of remediation as provided for in the ESD?”
 - “4. What assurances can MDEQ provide to area residents that MDEQ’s mitigation efforts have worked elsewhere and will work at the Montana Pole Plant?”

RESPONSE TO COMMENTS SPECIFIC TO ODOR

Overall Response to Comments A10 (Q10); I1: DEQ agrees that odors have previously been a significant issue in the community. Butte residents interviewed in 2016 said that odors had not been an issue within the last five years, which corresponds to reduced activity at the land treatment unit. The final offload construction could result in short-term odors. Several of those interviewed indicated a need for timely notification so the potentially affected residents can prepare before such activities are initiated.

At the February 24, 2020 public meeting at the Fire Training Center, DEQ made the commitment to the Boulevard Neighborhood and Williamsburg Communities to have pre-construction community meetings to discuss the pending construction. Specific odor mitigation strategies will be developed as part of the preparation for construction oversight and development of the construction bid package. DEQ will inform both communities of air monitoring and odor mitigation strategies along with other important construction details.

AGENCY ACCOUNTABILITY AND RULES

COMMENT SUMMARY

Seven original comments were received regarding DEQ’s accountability and rules (E4, E6, J2, J3, V.1-9, V.1-20, V.1-22). Comments insist that DEQ follow the requirements of the “Precautionary Principle and the Principle of Pollution”. Some comments were submitted twice; these comments are referred to as “duplicate comment” in the table below and italicized and within parentheses within the text. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Agency Accountability and Rules			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
E4	<i>V.1-12</i>		X
E6			X
J2		X	X
J3		X	X
V.1-9		X	X
V.1-20			X
V.1-22	J1		X

COMMENTS SPECIFIC TO AGENCY ACCOUNTABILITY AND RULES

- **Comment E4 (V.1-12).** “MDEQ has failed to apply the legally mandated principles of Pollution Prevention and the Precautionary Principle to the threat posed by dioxin at the Pole Plant.”
- **Comment E6.** “Montana Law Mandates the Application of the Principle of Pollution Prevention and the Precautionary Principle to the Cleanup of Montana Pole Plant”

“In interpreting the meaning of Articles II and IX of the Montana Constitution, the Montana State Supreme Court in *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236) found that Pollution Prevention and the Precautionary Principle were part of the Montana Constitution’s guarantee to citizens of a clean and healthy natural environment, i.e. these principles are part of Montana law. The Court found that “the right to a clean and healthful environment is a fundamental right. . . .” In analyzing the discussion and debate at the 1972 Montana Constitutional Convention, the Court determined that it was the clear intent of the participants that the environmental rights guaranteed in Articles II and IX were interrelated and that these two Articles espoused the principles of pollution prevention and the precautionary principle. For example, the Court cites Delegate McNeil who said in discussing how Articles IX’s subsections (1) and (3) were related: “It goes further than that and directs the Legislature to provide remedies to prevent degradation. This is anticipatory.” (Emphasis supplied.) It was also clear during the discussion and debate during the Montana Constitutional Convention that the delegates intended the environmental provisions of the Constitution to mandate an “improvement” of the natural environment. The Court stated: “In doing so, we conclude that the delegates’ intention was to provide language and protections which are both anticipatory and preventative. The delegates did not intend to merely prohibit that degree of environmental degradation that can be conclusively linked to ill health or physical endangerment. Our constitution does not require that dead fish float on the surface of our state’s rivers and streams before its farsighted environmental protections can be invoked....” The Montana Supreme Court’s decision is an unambiguous and binding statement

that the Principles of Pollution Prevention and the Precautionary Principle/Rule must direct the administration and implementation of ALL state laws, rules, and regulations.”

“The goal of Montana’s pollution prevention program is to “prevent pollution before it occurs. Pollution prevention is the highest step of the waste reduction hierarchy and occurs prior to the other steps of recycling, treatment, or disposal.” (MDEQ, What is “Pollution Prevention?”) See also: MCA 2003, 75-10-601; 75-1-602, 8 (b) (iii) and 75-1-103 (1) and (2) (a) Black’s Law Dictionary also provides guidance as to the meanings of the concepts articulated in the Montana Supreme Court case above quoted. Black’s defines potential as “Existing in possibility but not in act.” Threat is defined as a “menace.” Imminent is defined as: “Near at hand; mediate rather than immediate, close rather than touching, perilous.” Substantial is defined as of “Importance.” Certainly, dioxin left in place at the Montana Pole Plant site would present a potential threat and a substantial, imminent threat as defined in Black’s Law Dictionary.”

“Given that MDEQ is the “lead” agency for Montana Pole and given the legal relationship mandated in CERCLA in regard to the relationship between state and federal regulatory protocols, rubrics and standards, the Montana requirement that the Precautionary Principle and the Principle of Pollution prevention inform and guide remediation decisions must be respected by EPA and MDEQ.”

“The point of Montana law and federal law is that it is better to prevent pollution before it harms public health and the environment rather than treat or mitigate the effect of pollutants after they are released. The medical motto: *Primum non nocere* (First, do no harm.) would apply to pollution prevention. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant consideration and remediation of contaminated dioxin now rather than waiting for these contaminants to be released and then trying to treat them later. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant removing as much of the dioxin as possible so as not to threaten future generations. Dioxin waste-in-place is a serious threat-in-place.”

“The Pollution Prevention Principle and the Precautionary Principle are in effect ARARs for the Montana Pole Plant in Butte. In effect, the provisions of the Montana Supreme Court decision *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236 as well as the other citations listed above become ARARs which must be met for the Montana Pole Plant Operable Unit. This point is clearly articulated in: *United States v. Akzo Coating of America, Inc.* No. 88-CV-73784-DT (719 F. Supp. 571, 30 ERC 1361) (E.D. Mich. August 9, 1989) ARARs do not have to be numerical standards but can be found in the law of the state. The Akzo court found: “CERCLA envisions a substantial and meaningful role for the individual states in the development and selection of remedial actions to be taken within their jurisdictions. CERCLA also accommodates the environmental standards and requirements of the state in which a site is located.” “Congress has not . . . displaced state regulation. . . .” “CERCLA does not expressly preempt state law. . . .” With specific regard to numerical standards that court found: “Although the state law does not contain specific numerical standards, it is, as the State contends, legally enforceable and of general applicability. The EPA’s own publication (EPA, Superfund Program; Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements; Notice of Guidance, 52 Fed. Reg 32495, 32498 (Aug. 27, 1987) recognizes that general requirements having no specific numerical standards to be enforceable ARARs. General State goals that are duly promulgated (such as a non-degradation law) have the same weight as explicit numerical standards. . . .” The Court cites numerous other cases to support its conclusion.”

- **Comment J2.** “Given that MDEQ is the “lead” agency for Montana Pole and given the legal relationship mandated in CERCLA in regard to the relationship between state and federal regulatory protocols, rubrics and standards, the Montana requirement that the Precautionary Principle and the Principle of Pollution prevention inform and guide remediation decisions must be respected by EPA and MDEQ.”

“The point of Montana law and federal law is that it is better to prevent pollution before it harms public health and the environment rather than treat or mitigate the effect of pollutants after they are released. The medical motto: Primum non nocere (First, do no harm.) would apply to pollution prevention. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant consideration and remediation of contaminated dioxin now rather than waiting for these contaminants to be released and then trying to treat them later. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant removing as much of the dioxin as possible so as not to threaten future generations. Dioxin waste-in-place is a serious threat-in-place.”

- **Comment J3.** Court precedents as well as EPA policy mandate the use of the precautionary principle as it applies to Superfund sites in Butte. The Precautionary Principle/Standard and the Principle/Standard of Pollution Prevention, as mandated by the Montana Supreme Court decision Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236) are in effect ARARS for Montana Pole Plant.
- **Comment V.1-9.** “9. MDEQ has ignored the mandates of federal and state law regarding following the Precautionary Principle and the Principle of Pollution Prevention.”
- **Comment V.1-20.** “I would also make the argument that the Principles of Pollution Prevention and the Precautionary Principle, which are both part of federal and state law, demand that the dioxin be aggressively treated and not just covered up to exist as a perpetual threat in place to human health and the environment.”
- **Comment V.1-22 (J1).** “Precautionary Principle and Principle of Pollution Prevention: Definition and Scope”

“The essence of the precautionary principle is that government should act before harm to human health and the environment occurs from the releases of toxic substances. The precautionary principle “dictates that indication of harm, rather than proof of harm, should be the trigger for action.” (Sandra Steingraber, Living Down Stream: An Ecologist Looks at Cancer and the Environment, p. 270.) If there is a reasonable suspicion that harm to human health and the environment could occur from the release of a toxic substance, government should step in and fix the problem before it hurts people and the environment. The 1998 Wingspread Statement on the Precautionary Principle states: “When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.” Former EPA director Christine Todd Whitman stated: “policymakers need to take a precautionary approach to environmental protection. . . . We must acknowledge that uncertainty is inherent in managing natural resources, recognize it is usually easier to prevent environmental damage than to repair it later, and shift the burden of proof away from those advocating protection toward those proposing an action that may be harmful.” If there is a strong suspicion that something bad is going to happen, government has an obligation to stop it prior to its occurring. The precautionary principle is really grounded in old common sense sayings:

“An ounce of prevention is worth a pound of cure.” “Better safe than sorry.” “A stitch in time saves nine.” “Look before you leap.”

“The President’s Council on Sustainable Development supports the precautionary principle. The Council declared: “Even in the face of scientific uncertainty, society should take reasonable actions to avert risks where the potential harm to human health or the environment is thought to be serious or irreparable.” The American Public Health Association has passed a similar resolution concerning chemical exposure. (Resolution 9606)”

“The U.S. Court of Appeals for the District of Columbia Circuit upheld the EPA’s use of the precautionary principle in *Ethyl Corp. v. U.S. Environmental Protection Agency* (541 F. 2d 1, 6 ELR 20267 (D.C. Cir.), cert denied, 426 U.S. 941 (1967) This was the case which supported the banning of leaded gasoline by the EPA. The banning of lead additives to gasoline was an example of the precautionary principle in action. “The U. S. Court of Appeals for the D.C. Circuit upheld the U.S. Environmental Protection Agency’s decision to take a precautionary approach and ban lead anyway, even in the absence of scientific evidence adequate to demonstrate exactly what the risks from the lead were or what the benefits of removing it would be. As it turned out, banning leaded gasoline was the single most important contributor to the virtual elimination of lead from air and from most children’s blood.” (Charnley and Elliott, *Risk Versus Precaution: Environmental Law and Public Health Protection*, Environmental Law Institute, March 2002)”

“There is ample support for the precautionary principle from international organizations and treaties, to many of which the United States is a signatory, thereby creating a legal obligation. For example, the Rio Declaration from the 1992 United Nations Conference on Environment and Development, also known as Agenda 21, stated: “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.” The United States signed and ratified the Rio Declaration.”

“The precautionary principle is also part of the following: Ozone Layer Protocol, Second North Sea Declaration, United Nations Environment Programme, Nordic Council’s Conference Declaration of October 18, 1989, PARCOM Recommendation 89/1, Third North Sea Conference, Bergen Declaration on Sustainable Development, Second World Climate Conference, Bamako Convention on Transboundary Hazardous Waste into Africa, OECD Council Recommendation of January 1991, Maastricht Treaty on the European Union, Climate Change Conference, UNCED Text on Ocean Protection, and the Energy Charter Treaty.”

“Federal Cleanup Law Mandates the application of the Principle of Pollution Prevention and the Precautionary Principle”

“The Pollution Prevention Act of 1990 established as national policy the mandate that: “Pollution should be prevented or reduced at the source wherever feasible.” According to the EPA, pollution prevention means “source reduction” which is defined in the Pollution Prevention Act as any type of action which: “reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment or disposal” and “reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.” Pollution Prevention and the Precautionary Principle are also a part of several other federal laws: CERCLA, Clean Water Act, Toxic Substances Control Act, NEPA, RCRA, EPCRA, and the Clean Air Act. For a more detailed

discussion of the role of pollution prevention and the precautionary principle in federal environmental law see: Advancing Environmental Justice through Pollution Prevention: A Report developed from the National Environmental Justice Advisory Council-A Federal Advisory Committee to the U.S. Environmental Protection Agency, June 2003. As this report makes clear, there is an intimate relationship between environmental justice, pollution prevention, and the use of the precautionary principle, all of which are EPA policy mandates.”

“Montana Law Mandates the Application of the Principle of Pollution Prevention and the Precautionary Principle”

“In interpreting the meaning of Articles II and IX of the Montana Constitution, the Montana State Supreme Court in *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236) found that Pollution Prevention and the Precautionary Principle were part of the Montana Constitution’s guarantee to citizens of a clean and healthy natural environment, i.e. these principles are part of Montana law. The Court found that “the right to a clean and healthful environment is a fundamental right. . . .” In analyzing the discussion and debate at the 1972 Montana Constitutional Convention, the Court determined that it was the clear intent of the participants that the environmental rights guaranteed in Articles II and IX were interrelated and that these two Articles espoused the principles of pollution prevention and the precautionary principle. For example, the Court cites Delegate McNeil who said in discussing how Articles IX’s subsections (1) and (3) were related: “It goes further than that and directs the Legislature to provide remedies to prevent degradation. This is anticipatory.” (Emphasis supplied.) It was also clear during the discussion and debate during the Montana Constitutional Convention that the delegates intended the environmental provisions of the Constitution to mandate an “improvement” of the natural environment. The Court stated: “In doing so, we conclude that the delegates’ intention was to provide language and protections which are both anticipatory and preventative. The delegates did not intend to merely prohibit that degree of environmental degradation that can be conclusively linked to ill health or physical endangerment. Our constitution does not require that dead fish float on the surface of our state’s rivers and streams before its farsighted environmental protections can be invoked....” The Montana Supreme Court’s decision is an unambiguous and binding statement that the Principles of Pollution Prevention and the Precautionary Principle/Rule must direct the administration and implementation of ALL state laws, rules, and regulations.”

“The goal of Montana’s pollution prevention program is to “prevent pollution before it occurs. Pollution prevention is the highest step of the waste reduction hierarchy and occurs prior to the other steps of recycling, treatment, or disposal.” (MDEQ, What is Pollution Prevention?) See also: MCA 2003, 75-10-601; 75-1-602, 8 (b) (iii) and 75-1-103 (1) and (2) (a)”

“Black’s Law Dictionary also provides guidance as to the meanings of the concepts articulated in the Montana Supreme Court case above quoted. Black’s defines potential as “Existing in possibility but not in act.” Threat is defined as a “menace.” Imminent is defined as: “Near at hand; mediate rather than immediate, close rather than touching, perilous.” Substantial is defined as of “Importance.” Certainly, dioxin left in place at the Montana Pole Plant site would present a potential threat and a substantial, imminent threat as defined in Black’s Law Dictionary.”

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“The point of Montana law and federal law is that it is better to prevent pollution before it harms public health and the environment rather than treat or mitigate the effect of pollutants after they are released. The medical motto: Primum non nocere (First, do no harm.) would apply to pollution prevention. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant consideration and remediation of contaminated dioxin now rather than waiting for these contaminants to be released and then trying to treat them later. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant removing as much of the dioxin as possible so as not to threaten future generations. Dioxin waste-in-place is a serious threat-in-place.”

“The Pollution Prevention Principle and the Precautionary Principle are in effect ARARs for the Montana Pole Plant in Butte”

“In effect, the provisions of the Montana Supreme Court decision *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236 as well as the other citations listed above become ARARs which must be met for the Montana Pole Plant Operable Unit. This point is clearly articulated in: *United States v. Akzo Coating of America, Inc.* No. 88-CV-73784-DT (719 F. Supp. 571, 30 ERC 1361) (E.D. Mich. August 9, 1989) ARARs do not have to be numerical standards but can be found in the law of the state. The Akzo court found: “CERCLA envisions a substantial and meaningful role for the individual states in the development and selection of remedial actions to be taken within their jurisdictions. CERCLA also accommodates the environmental standards and requirements of the state in which a site is located.” “Congress has not. . .displaced state regulation. . . .” “CERCLA does not expressly preempt state law. . . .” With specific regard to numerical standards that court found: “Although the state law does not contain specific numerical standards, it is, as the State contends, legally enforceable and of general applicability. The EPA’s own publication (EPA, Superfund Program; Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements; Notice of Guidance, 52 Fed. Reg 32495, 32498 (Aug. 27, 1987) recognizes that general requirements having no specific numerical standards to be enforceable ARARs. General State goals that are duly promulgated (such as a non-degradation law) have the same weight as explicit numerical standards. . . .” The Court cites numerous other cases to support its conclusion.”

“What are ARARs for Purposes of Montana Pole Plant?”

“According to the CERCLA/Superfund Orientation Manual (EPA/542/R-92/005, October 1992), ARARs are defined as “Any standard, requirement, criterion, or limitation under a State environmental or facility-siting law. . . .” Certainly, a decision of the Montana State Supreme Court, given the doctrine of judicial review, would qualify as a requirement, standard, criterion or limitation.” This Montana Supreme Court decision is more stringent than any other federal court decision. So given that it is enforceable, has been promulgated and is more stringent than federal case law (See: CERCLA/Superfund Orientation Manual, p. XII-2 and XII-6), this decision is an ARAR. “CERCLA, Section 121(d)(2) requires compliance with applicable or relevant and appropriate state requirements when they are more stringent than federal rules and have been ‘promulgated’ at the state level. To be viewed as promulgated and serve as an ARAR at a Superfund site, a state requirement must be legally enforceable, based on specific enforcement provisions or the state’s general legal authority, and must be generally applicable, meaning that it applies to a broader universe than Superfund site.” (RCRA, Superfund and EPCRA Hotline Training Module: Introduction to Applicable or Relevant and Appropriate Requirements, (EPA540-R-020, OSWER9205.5-10A, June

1998, p. 19) Clearly the Precautionary Principle and the Principle of Pollution Prevention, as mandated by the Montana Supreme Court Decision *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236), as well as Montana state environmental policy as articulated in the MCA, are clearly ARARs for the Montana Pole Plant site. As we know, CERCLA does not contain its own cleanup standards but relies heavily on state ARARs. “Regulation codified in the NCP governs the identification of ARARs and require compliance with ARARs throughout the Superfund response process, including. . .removal actions.” (RCRA, Superfund and EPCRA Hotline Training Module: Introduction to Applicable or Relevant and Appropriate Requirements, (EPA540-R-020, OSWER9205.5-10A, June 1998, p. 1) Of course, as previously cited, ARARs do not have to be numerical or quantitative.”

“The point is that both Court precedents as well as EPA policy mandate the use of the precautionary principle as it applies to the Montana Pole Plant in Butte. The Precautionary Principle/Standard and the Principle/Standard of Pollution Prevention, as mandated by the Montana Supreme Court decision *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236) are in effect ARARS for Montana Pole Plant.”

RESPONSE TO COMMENTS SPECIFIC TO AGENCY ACCOUNTABILITY AND RULES

Overall Response to Comments J2; J3; V.1-9; E4 (V. 1-12); E6; V.1-20; V.1-22: The 2020 Draft ESD issued by DEQ for public comment at the MT Pole Site adheres to all Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements, which are intended to eliminate or mitigate the further release of hazardous substances. The original MT Pole Site Record of Decision (ROD) and this ESD outline a remedy that is protective of human health and the environment, and meets the applicable or relevant and appropriate requirements (ARARs) for this site. The Precautionary Principle and the Principle of Pollution Prevention are not promulgated standards – a requirement for classification as an ARAR – and are therefore not ARARs as that term is defined under CERCLA and Comprehensive Environmental Cleanup and Responsibility Act (CECRA) law and regulation.

Specific Response to Comment J2: CERCLA, 42 U.S.C. §9621(b)(1) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Sec. 300.430(f) contain the criteria to be assessed when analyzing remedial alternatives. These criteria are to be weighed in order to determine the best remedial alternative available. The Corrective Action Management Unit (CAMU) proposed in the ESD (as well as the Operations and Maintenance (O&M) procedures/activities that will be put into place to protect the remedy), which will effectively contain the contaminants of concern at the MT Pole Site far into the future, was properly analyzed using the statutory and regulatory criteria.

Specific Response to Comment J3: DEQ disagrees that the ROD and ESD are in violation of State statutory and case law. As noted in response to comment J2 (above) the selected remedy was evaluated against other remedial alternatives (as is required by CERCLA and CECRA) using the criteria required by law and regulation, and was chosen by DEQ and approved by the U.S. Environmental Protection Agency (EPA), after considering public comment, as the preferred alternative to prevent the release of hazardous substances that could pose a threat to human health and the environment.

Specific Response to Comment V.1-9: DEQ disagrees with the characterization that the ESD ignores any mandates related to federal and State law. See above General Response and Specific Response to Comment J3. The CAMU has been carefully designed in order to prevent the further release of the contaminants of concern, including dioxins/furans (dioxin), being addressed at the MT Pole Site.

BIOLOGICAL TREATMENT

COMMENT SUMMARY

One original comment was received regarding Biological Treatment (K1). One comment was received not specific to the 2020 Draft ESD and was previously submitted to and addressed by the Fourth Five-Year Review (K4). Comment K4 and the response is located in Appendix B. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Biological Treatment			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
K1		X	

COMMENT SPECIFIC TO BIOLOGICAL TREATMENT

- **Comment K1.** “Through the responsiveness summary, what assurances can be offered that all efforts were exhausted before deciding to abandon active biological treatment of the dioxins at the Montana Pole Plant in favor of passive capping?”

RESPONSE TO COMMENT SPECIFIC TO BIOLOGICAL TREATMENT

Specific Response to Comment K1: The ROD recognized that the biological degradation rate of dioxin “is generally very slow when compared to other organic compounds.” While biological treatment did achieve cleanup levels for pentachlorophenols (PCP) and polycyclic aromatic hydrocarbons (PAHs) and dioxin levels were reduced significantly, cleanup levels for dioxin were not achieved.

DEQ conducted a detailed examination of dioxin remediation alternatives (DEQ Memo: *More Consideration and Evaluation of Alternatives*, DEQ, April 2018) that included the status of bioremediation, specifically the use of white rot fungi (WRF). While WRF-based remediation shows promise in the laboratory, it is still considered an emerging technology with limited field studies. DEQ determined that WRF treatment is inappropriate for the MT Pole site for the following reasons:

- Extremely low dioxin cleanup levels, below 1 microgram per kilogram ($\mu\text{g}/\text{kg}$), are hard to achieve in the laboratory. This ESD updates the dioxin soil cleanup level to $0.03 \mu\text{g}/\text{kg}$. Achieving these updated levels would require a removal efficiency greater than 99 percent. The most effective proven dioxin treatment technologies seldom achieve greater than 90 percent.
- Successful laboratory dioxin treatments provide ideal growth conditions which are impossible to replicate in the field. WRF stops growing below 50°F , which would limit the amount of time per year when active treatment is occurring and prolong the cleanup.
- The cultivation and delivery of WRF is expensive, as is inoculating soils. The cost to apply WRF to the 200,000 cubic yards of soil would be a large financial risk considering that containment/capping would likely still be required after treatment because the technology is not expected to achieve dioxin cleanup levels.

DEQ also performed an international query into remedial alternatives for dioxin other than consolidation and capping, or incineration. No applicable results were found by the query.

The 2020 Draft ESD proposed change to manage soils with dioxin concentrations above cleanup levels in a CAMU is consistent with both the EPA guidance for dioxin and the ROD because it enhances the containment by using an engineered cap. It is also consistent with Resource Conservation and Recovery Act (RCRA) requirements for managing wood treating waste (F032, F034) in a CAMU.

CLEANUP AND CLEANUP LEVELS

SUMMARY OF COMMENTS

Eleven original comments were received regarding the Cleanup and Cleanup Levels. Four comments are general cleanup level questions in regard to the ROD (A11 (Q11) E2 (V.1-10), T5, T9), five comments are concerning the ESD cleanup level calculations (S4, S6, S7, S8, S12) and two comments are specific to leaching to groundwater (S11, T6). One comment (G2 (V.2-2) was not specific to the ESD and was previously submitted to and addressed by the Fourth Five-Year Review. Comment G2 (V.2-2) and the response is located in Appendix B. Some comments were submitted twice, these comments are referred to as “duplicate comment” in the table below and italicized and placed within parentheses within the text. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Cleanup and Cleanup Levels			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
A11	Q11		X
E2	V.1-10	X	X
S4		X	
S6		X	
S7		X	
S8		X	
S11		X	X
S12		X	
T5		X	X
T6		X	X
T9		X	

GENERAL COMMENTS SPECIFIC TO CLEANUP LEVELS

- **Comment A11 (Q11).** “MDEQ has had a “spotty” record in meeting the requirements of the ROD for the site and water quality standards. What assurances can be given to the public that going forward the pole Plant will be in compliance?”
- **Comments E2 (V.1-10).** “5. MDEQ has decided not to adhere to the cleanup standards in the ROD for Montana Pole but will waive them.”
- **Comment T5.** “3. We are pleased that soil cleanup levels have been updated using current methods and a more protective cancer risk level.”

“The ESD provides revised site specific soil cleanup levels for recreation, industrial, and construction worker exposures. Also included are soil cleanup levels which consider leaching of PCP to groundwater. The revised cleanup levels were recalculated using updated exposure parameters and toxicity criteria.”

“The community’s expectation is that those portions of the site outside of the repository CAMU will eventually be cleaned to allow redevelopment and unlimited exposure for recreational or industrial uses. The ESD will ensure that surface soil at the site is cleaned to these revised lower levels or soils which have residual contamination will be contained in the repository CAMU. This is an improvement in safety. The revised cleanup levels will further protect people who use the site in the future over those selected in the 1993 ROD.”

- **Comment T9.** “2. Section 3.3 states “This ESD changes the 1993 ROD by indicating that soils at or near the ground surface, with PCP concentrations greater than 2,000 µg/kg, will be placed and managed in a CAMU...” The meaning of “soils at or near the ground surface” should be clarified. The reasons for selection of the maximum excavation depth for soils exceeding the cleanup level should be given and the basis for the depth as provided for in the ROD.”

RESPONSE TO GENERAL COMMENTS SPECIFIC TO CLEANUP LEVELS

Overall Response to Comments A11 (Q11); E2 (V.1-10); T5: The original ROD soil remedy at the MT Pole Site is active remediation through biological treatment. Biological treatment met PCP and PAH cleanup levels, effectively reducing the toxicity and mobility of those contaminants. However, the ROD soil cleanup level for dioxin was not achieved, although significant reductions in dioxin levels were achieved. The 2020 Draft ESD proposed change to manage soils with dioxin concentrations above the proposed soil dioxin cleanup level in a CAMU will effectively prevent human exposure to unacceptable levels of dioxin. The proposed CAMU for the disposal of contaminated soils after active treatment of dioxin is consistent with both the EPA guidance for dioxin and the ROD because it enhances the containment by using an engineered cap.

Water treatment plant discharge and surface water have consistently met ROD cleanup levels since 2001. The water treatment plant discharge meets the ROD PCP cleanup level 97% (970 samples out of 1000 samples taken) of the time since 2001. The water treatment plant discharge has met the ROD dioxin cleanup level 100% of the time.

All surface water PCP samples since 2007 meet the ROD PCP standard for surface water. All surface water dioxin samples since testing began in 2006 also meet the ROD dioxin standard for surface water.

The groundwater plume associated with MT Pole contamination continues to shrink through implementation of the ROD-specified remedy of pump and treat through the water treatment plant as identified in the *2019 MPTP Annual Report* (Tetra Tech, November 2020). Also, as acknowledged in the 2020 Draft ESD, “[a] separate ESD or ROD Amendment is anticipated to address other items identified in the Fourth Five-Year Review Report that pertain to groundwater and surface water.”

Specific Response to Comment E2 (V.1-10): DEQ and EPA are not waiving any of the ROD cleanup levels or proposed ESD cleanup levels. All of the proposed ESD cleanup levels are more protective than the original ROD cleanup levels.

Specific Response to Comment T5: Comment noted.

Specific Response to Comment T9: “At or near ground surface” is intended to describe surface soils. All soils at a depth of 0-2 feet (surface soil) that exceed the 2,000 ug/kg cleanup level will be removed and placed in the CAMU. The *Soil and Surface Water Data Gap Investigation Report* (DEQ, November 2017) identified the surface soil as having PCP concentrations greater than the proposed cleanup level of 2,000 ug/kg. The majority of soils greater than 2 feet in depth did not contain PCP concentrations greater than the proposed cleanup level. Any soils greater than 2 feet in depth that do contain PCP concentrations greater than 2,000 ug/kg will be removed and placed in the CAMU.

COMMENTS SPECIFIC TO CLEANUP CALCULATION

- **Comment S4.** “Soil cleanup levels were set in the 1993 ROD based on a 1×10^{-6} cancer risk level for “the most susceptible exposure pathway” for recreational land use at the Site for each constituent of concern (exact language quoted below). See 1993 ROD at Decision Summary, § IX. Specifically, dermal risk was used to set the PCP cleanup level of 34,000 $\mu\text{g}/\text{kg}$, while ingestion risk was used to set the dioxins/furans and PAH cleanup levels (0.2 $\mu\text{g}/\text{kg}$ and 4,200 $\mu\text{g}/\text{kg}$, respectively). The correct terminology for this would be “the most susceptible exposure route.” Total cancer risks for dioxins/furans for all exposure routes were 1.7×10^{-6} , and total cancer risks for all three chemicals were 3.86×10^{-6} . Thus, the 1993 ROD contemplates that acceptable total risk for recreational use is about 4×10^{-6} .”

“The 1993 ROD also states “[s]oil cleanup levels have been developed to protect recreational and industrial land users at the site from excessive health risks.” 1993 ROD at p. 37. The ESD incorrectly claims that “the 1993 ROD based soil cleanup levels for human exposure on recreational use RPGS, and not on industrial use PRGs.” Table 24 of the 1993 ROD includes both recreational and industrial risks at the selected cleanup levels. Total risks for industrial land users at these cleanup levels were estimated to be 2×10^{-5} , and the total risks for all exposure routes for dioxins/furans were estimated to be 9.13×10^{-6} . Thus, based on the language in the 1993 ROD, no changes to the MPTP remedy are necessary as long as the cleanup levels are still protective for industrial land use at a total cancer risk level of 2×10^{-5} .”

“The ESD proposes to lower the soil cleanup levels based on updated exposure parameters and toxicity criteria along with using a 1×10^{-6} cancer risk level for all evaluated exposures (i.e., recreational, industrial, and construction worker). AR does not object to updating the derivation of the cleanup levels using the latest exposure factors and toxicity values, but disagrees that cleanup levels based on industrial and construction worker exposure should utilize 1×10^{-6} cancer risk levels. Specifically, the 1993 ROD: (1) states that industrial cleanup levels based on total cancer risk of 2×10^{-5} are protective; and (2) does not base cleanup levels on cumulative cancer risk for recreational exposure by all routes of exposure of 1×10^{-6} , but instead bases it on the risk for the most susceptible exposure route. In the case of dioxins/furans, the cumulative cancer risk for all routes in the 1993 ROD was 1.7×10^{-6} .”

- **Comment S6.** “Section 3.1 of the ESD states the agencies used updated exposure parameters and toxicity criteria included in Attachment B to calculate updated ESD cleanup levels (referred to in Attachment B as site-specific cleanup levels or SSCLs). AR notes that the Attachment B cover page dates the memo 10/3/17, but the date on the memo itself is 5/31/16. This latter date appears to be the correct date because the memo did not incorporate significant toxicity value updates

published by EPA on 1/19/17 on the Integrated Risk Information System (IRIS) for benzo(a)pyrene (BaP), which form the basis for the cleanup levels for PAHs. These updates are provided in Table 2 below.”

Table 2. Comparison of BaP Toxicity Values

Type	Old BaP Toxicity			New BaP Toxicity		
	Value	Units	Source	Value	Units	Source
Oral Cancer Slope Factor	7.3	(mg/kg/d) ⁻¹	IRIS 1994	1	(mg/kg/d) ⁻¹	IRIS 2017
Inhalation Unit Risk	1.1	(mg/m ³) ⁻¹	Cal EPA 1993	0.6	(mg/m ³) ⁻¹	IRIS 2017

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Reference Dose	None	3E-04	mg/kg/d	IRIS 2017
Reference Concentration	None	2E-06	mg/m ³	IRIS 2017

“Using this updated oral cancer slope factor of 1 (mg/kg/d)-1 for BaP would result in SSCLs approximately seven-fold higher than the ones presented in Attachment B to the ESD for carcinogenic polycyclic aromatic hydrocarbons (cPAH). A comparison of the SSCLs is provided in Table 3 below.”

Table 3. Comparison of cPAH Soil Cleanup Levels

Chemical	Recreational		Industrial		Construction	
	Proposed SSCL (µg/kg)	Updated BaP SF SSCL (µg/kg)	Proposed SSCL (µg/kg)	Updated BaP SFSSCL (µg/kg)	Proposed SSCL (µg/kg)	Updated BaP SF SSCL (µg/kg)
Carcinogenic PAHs (TEF)	2,000	14,500	500	3,900	5,000	39,000

“Additionally, the Attachment B memo states the cPAH toxicity “is still based upon the toxicity equivalence to benzo(a)pyrene and the same TEFs are used to calculate cPAH TEQ SSCLs as were used to calculate the PRGs.” It isn’t clear that the TEFs do affect the SSCLs, but the toxicity equivalence factors used for the PRGs in the 1993 ROD (Table 28) are not consistent with the relative potency factors (RPF) recommended by EPA in the 1993 Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. A comparison of the RPF and TEF values is provided in Table 4 below.”

Table 4. Comparison of PAH TEFs with RPFs

Chemical	1993 EPA RPF	1993 ROD TEF
Benzo(a)anthracene	0.1	0.01
Benzo(b)fluoranthene	0.1	1
Benzo(k)fluoranthene	0.01	0.01
Benzo(a)pyrene	1	1
Benzo(g,h,i)perylene	NA	0.01
Chrysene	0.001	0.01
Dibenz(a,h)anthracene	1	1
Indeno(1,2,3-cd)pyrene	0.1	0.01

- Comment S7.** “The ESD soil cleanup levels for dioxins/furans are 0.1 µg/kg for recreational settings and 0.04 µg/kg for industrial settings (as noted above, Table 1 of the ESD incorrectly lists the industrial cleanup level as 0.03 µg/kg) based on cancer risks. As discussed in more detail below, basing the dioxins/furans soil cleanup level on cancer risk is inconsistent with current EPA guidance and results in proposed cleanup levels that are at least ten-fold lower than the cleanup levels that result when following EPA guidance to use noncancer risks as the basis for dioxins/furans cleanup levels in soil. These lower cleanup levels are overly restrictive, not required to protect human health and the environment, and will potentially increase remedy costs without corresponding benefit for the community.”

“Since the revised reference dose (RfD) for noncancer effects for 2,3,7,8-tetrachloro dibenzo-p-dioxin (TCDD) was issued by EPA in 2012, the agency has identified the RfD for 2,3,7,8-TCDD as the appropriate basis for derivation of cleanup levels for dioxins/furans. EPA’s website entitled Risk Assessment for Dioxin at Superfund Sites (EPA 2018) makes clear the agency’s intention to derive cleanup levels based on the final EPA (2012) RfD for 2,3,7,8-TCDD and other dioxin and furans based on TEQ.”

“To be consistent with EPA guidance, the dioxin/furan cleanup levels should be derived using the RfD and noncancer risk estimates. Table 5 below shows SSCLs based on the noncancer risk using the 2012 EPA RfD and the updated exposure parameters used by DEQ in Attachment B. The lowest SSCL is for construction workers. This value is 0.5 µg/kg for both the ingestion pathway and for all exposure routes combined. To be consistent with EPA guidance, the ESD should increase the dioxins/furans soil cleanup level from 0.2 µg/kg to 0.5 µg/kg, rather than decreasing it to 0.04 µg/kg.”

- Comment S8.** “In 2010, EPA issued a literature review of studies that examined the relative bioavailability (RBA) of dioxins in soil and concluded that “[c]ollectively, at this time these results support the conclusion that the RBA for dioxin in the soils evaluated in these studies is less than, and likely to be substantially less than 100%....” Nevertheless, EPA found that available data were inadequate to support a default value less than 100% that could be applied to all contaminated sites.”

“In 2015, EPA issued guidance for conducting site-specific studies of soil dioxin/furan RBA. The RBA of weathered dioxins/furans at an old site like MPTP is expected to be quite low. The potential impact of this factor on cleanup levels is significant. For example, if the RBA for dioxins/furans is 40% instead of the 100% assumed by DEQ, the cleanup level would change. The weathered material would have a cleanup level that is 2.5 times higher (less stringent) than the level that DEQ proposes

to use in the ESD. Due to the potentially significant impact of this factor on the scope and extent of remediation, the MPTP dioxins/furans cleanup levels should not be revised without first assessing the relative bioavailability, following EPA guidance. AR requests that DEQ perform such an evaluation and provide proper documentation in the final ESD.”

“Similar to dioxins/furans, numerous studies have provided evidence to reduced RBA for soil PAHs with a wide range of reported values and study methods (Ruby et al. 2016). Ruby et al. provide guidance for study design, and a site-specific study should be conducted prior to any changes in the MPTP soil PAH cleanup levels.”

- **Comment S12.** “The 1993 ROD indicated residential use would be restricted, anticipated recreational use as the likely future land use, and used recreational exposure via “the most susceptible exposure pathway” at a 1×10^{-6} cancer risk level as the basis for soil cleanup levels. The ROD indicated that these soil cleanup levels would be protective of industrial use exposure (total risk for PCP, dioxins/furans, and PAHs of 2.0×10^{-5} risk) and did not restrict future industrial use despite the higher risk level.”

“The ESD clarifies that future residential land use will be prohibited and updates the soil cleanup levels to be based on industrial exposure at a 1×10^{-6} risk level, a change that is inconsistent with the statement in the ROD that cleanup levels based on recreational exposure are also protective for industrial exposures. See Specific Comment #1 (*S1 in Responsiveness Summary*) above for discussion of the change in industrial use risk level. The ESD appears to be based on a misunderstanding of the 1993 ROD requirements, and AR asks the agencies to reconsider this change after reviewing the ROD.”

RESPONSE TO COMMENTS SPECIFIC TO CLEANUP CALCULATION

Specific Response to Comment S4: DEQ has chosen a more conservative approach to the calculation of the updated cleanup levels. DEQ also chose to include an industrial worker cleanup level since the risk of 2×10^{-5} described in the original ROD is no longer considered protective by DEQ. DEQ has knowledge that the use of this property will be industrial and commercial. Therefore, to be protective of this receptor (i.e. an industrial worker), a clean-up level has been calculated using a target risk of 1×10^{-6} consistent with the cancer risk (1×10^{-6}) used to calculate soil cleanup levels and corresponding risks in the ROD.

Specific Response to Comment S6: DEQ will update the 2020 Draft ESD Attachment B *DEQ Memos (6-3-2016 & 10-3-2017) Regarding Soil Cleanup Levels* to include both the June 2016 and the October 2017 memorandums which discuss the development of the cleanup levels and includes the updated toxicity criteria for PAHs. The toxic equivalency factors (TEFs) do not affect the calculation of the cleanup levels and therefore, DEQ’s cleanup level updates did not require an adjustment to the TEFs.

Specific Response to Comment S7: DEQ does not believe that defaulting completely to non-cancer effects, with the assumption these will cover carcinogenic effects, is a protective approach. DEQ will continue to include carcinogenic effects of dioxin in its determination of cleanup levels at this site and other sites where it is the lead agency.

Specific Response to Comment S8: Assuming 100% relative bioavailability (RBA) is an acceptable and protective approach for calculating cleanup levels for these compounds and DEQ will keep the RBA at 100% for the ESD.

Specific Response to Comment S12: Please See DEQ's response to Specific Comment S4 above.

COMMENTS SPECIFIC TO LEACHING-TO-GROUNDWATER CLEANUP NUMBERS

- **Comment S11.** "Based on the review of Attachment C, which uses the New Jersey SPLP guidance and site-specific data, it appears (but is unclear) that the site-specific dilution-attenuation ratio in the excel model was not modified from 20 to 79. By applying the site-specific dilution-attenuation ratio of 79, the appropriate removal standard would be 0.55 mg/kg. Either removal standard has the potential to notably increase the size of the CAMU, as well as the cost of the remedy. AR requests that DEQ update Attachment C to use the actual DAF value, and re-evaluate the cost of the proposed work based on the corrected values."

"If removal is guided by the appropriate cleanup thresholds, additional source material will remain under the Interstate and within the CAMU. A CAMU with a waterproof plastic barrier will have a percolation rate; and a rate of from 1-3% of precipitation may be within the design specifications of this barrier. The CAMU source needs to be considered appropriately in the ESD."

"Finally, the parameters in the DAF calculation are difficult to track. AR has the following questions, which it requests that DEQ address in preparing any revised proposed and final ESD: 1. Is the assumption that 10% of precipitation infiltrates to recharge groundwater appropriate for the unlined portions of the Site? This likely is too low. 2. Is the hydraulic conductivity of 100 ft/day appropriate? Specific reference is not provided. 3. Is the hydraulic gradient appropriate? The excel model references the RI, which was prior to putting the groundwater capture system in place, and current monitoring. Which was used? 4. Are the aquifer area and mixing depth for the DAF appropriate? Calculations were not provided."

- **Comment T6.** "4. The evidence in the PCP leaching to groundwater analysis suggests a more conservative soil cleanup level."

"Attachment C (the PCP leaching to groundwater analysis) is a multiple lines of evidence approach to determining the soil PCP cleanup level which will protect groundwater from leaching. Some of the lines of evidence which were used to select a higher, less conservative soil cleanup level are problematic."

"Line of evidence #1 uses data from monitoring wells MW-A-95, MW-09, and GW-09 and suggests that these wells should show an impact from backfilled soils if that soil was leaching PCP to groundwater. However, it is not clear the analysis considered the dilution capability of the aquifer between the well intake and the source or considered whether PCP leaching to the groundwater has reached equilibrium. Also, two of these wells are shown on Exhibit 2 as "PCP generally less than 1 µg/L." This does not give confidence that the groundwater cleanup standard of 1 µg/L will be met."

"Line of evidence #2 compares an area with soils with elevated PCP to water quality in monitoring wells a long distance downgradient. The monitoring wells are way too far away and are subject to

mixing with Silver Bow Creek water to provide a basis for measuring groundwater contamination by these small areas of PCP contamination.

“We believe the best evidence is provided by the NJ SPLP leaching model and LTU leachate data which suggest a PCP cleanup level as low as 0.56 mg/kg is appropriate. These methods are most appropriate for evaluating the soil cleanup level because they are not subject to hydrogeological heterogeneities and mixing that the site monitoring well water quality data is. The groundwater cleanup level should be met, if possible, at the nearest groundwater to the source. We recommend that the final soil leaching to groundwater cleanup levels be based on a thorough examination of the NJ SPLP leaching model and LTU leachate data, or additional SPLP data and modeling, given these considerations.”

RESPONSE TO COMMENTS SPECIFIC TO LEACHING-TO-GROUNDWATER CLEANUP NUMBERS

Overall Response to Comments T6; S11: DEQ agrees that the New Jersey Synthetic Precipitation Leaching Procedure (SPLP) Leaching Model is a useful tool. However, this method is not appropriate as a stand-alone method for selecting soil cleanup values for the following reasons:

1. The New Jersey SPLP Leaching Model does not evaluate natural biological remediation during transport of PCP in the vadose zone and groundwater.
2. The conditions of the SPLP test are designed to simulate precipitation with a pH of 4.2. Thus, the test more realistically estimates the leaching potential of contaminants that may occur under field conditions such as those in New Jersey with more acidic precipitation than those of Montana.
3. Leachate concentrations measured under the conditions of the SPLP test do not necessarily represent leachate concentrations that would be observed in the field because the water to soil ratio (20:1) affects the resulting leachate concentration.
4. The New Jersey SPLP Leaching Model does not account for potential sorption onto new soil particles during transport resulting in decreased mobility of PCP. For example, a high organic or clay horizon would alter the potential sorption.
5. SPLP results can be highly spatially dependent. The SPLP results from the *Soil and Surface Water Data Gap Investigation Report* (DEQ, November 2017) ranged across three orders of magnitude (5.0 to 338.3 liters per kilogram [L/kg]) not including the default Kd value of 0.0001 L/kg.
6. Measurement errors for both the bulk soil PCP and leachate PCP concentrations can result in the observed greater mass of PCP in leachate compared to the bulk soil, observed as a Percent Contaminant in Leachate of greater than 100 percent. For the *Soil and Surface Water Data Gap Investigation Report* (DEQ, November 2017) five of the seventeen samples had greater than 100 percent of contaminant in leachate, these values are then given a default Kd value of 0.0001 L/kg.

For these reasons, DEQ used other models in addition to the New Jersey SPLP Leaching Model.

Specific Response to Comment S11: DEQ disagrees. When using the New Jersey guidance, changing the dilution attenuation factor (DAF) from 20 to 79 will not change the reported removal threshold value of 0.56 milligrams per kilogram (mg/kg). Site specific DAF was calculated with the following inputs as described in Appendix D of the *Soil and Surface Water Data Gap Investigation Report* (DEQ, November 2017):

- Infiltration assumed at 20% of annual precipitation
- Length of source parallel to flow — (900 feet) (Note: value based on Option 3 conceptual offload configuration)
- Aquifer thickness – (22 feet) (Note: average site value based on remedial investigation [RI] report [page 1-23])
- Mixing zone depth – (22 feet) (Note: this value is calculated using the New Jersey Department of Environmental Protection (NJDEP) DAF formulae; the NJDEP spreadsheet-calculated mixing zone depth was greater than 22 feet; therefore, by default, the spreadsheet assigned a mixing zone thickness equal to the depth of the aquifer.)
- Hydraulic conductivity — (100 feet/day)
 - Justification for this assumption was explained in detail in Attachment 2 of Appendix D in the *Soil and Surface Water Data Gap Investigation Report* (DEQ, November 2017).
- Hydraulic gradient (0.005 foot/foot) (Note: value based on RI report [page 3-12], and recent MT Pole annual monitoring and sampling reports [Tetra Tech 2015]).

Specific Response to Comment T6: The monitoring wells referenced in the 2020 Draft ESD (MW-A-95, MW-09, and GW-09) are the closest monitoring wells south of the interstate, near the previously offloaded soil, and within the proposed CAMU area.

- Monitoring well MW-09 is directly adjacent to, and potentially within, the report 2005 Land Treatment Unit (LTU) soil offload area.
- Monitoring well MW-A-95 is across the dirt access road (~10 feet) from the reported 2007 LTU soil offload area.
- Monitoring well GW-09 is further down gradient (~25 feet) from the reported 2005 & 2007 LTU soil offload area.

For monitoring well GW-09, all groundwater samples have been less than 1 microgram per liter ($\mu\text{g/L}$) with the exception of the sample collected in July 2018 with a concentration of 1.41 $\mu\text{g/L}$. Since 2005, monitoring well MW-09 had one exceedance, which was in August 2019 with a PCP concentration of 1.09 $\mu\text{g/L}$. Monitoring well MW-A-95 has exceeded PCP concentration of 1 $\mu\text{g/L}$ ten times since 2005. The most recent exceedances were in February and August 2018 and were 6.83 and 1.6 $\mu\text{g/L}$, respectively. The most recent exceedances for all three monitoring locations occurred following above normal precipitation in 2018, which is believed to have flushed residual PCP from soils under the highway and water treatment plant as indicated by an increased source area PCP groundwater plume observed in 2018 and 2019. There is no observed correlation between the timing of LTU offloading of soils and increased PCP concentrations at these three monitoring locations.

Additional Monitoring Wells PZ-S4-01 and MW-14 are within the 2000 & 2001 LTU soil offload area. For both monitoring locations PCP concentrations have remained < 1 $\mu\text{g/L}$ through the most recent (February 2020) groundwater sampling event since at least 2010.

Of the five down-gradient monitoring wells, the closest monitoring well is MW-C-01, which is ~150 feet down gradient and ~450 feet upgradient of Silver Bow Creek. The PCP concentration from samples collected at this monitoring location has been below 1 $\mu\text{g/L}$ since November 2010. This monitoring well is also upstream of the Near Creek Recovery Trench, suggesting that the possibility of this monitoring well being impacted by Silver Bow Creek is unlikely.

COMMUNITY INVOLVEMENT

COMMENT SUMMARY

Four original comments were received regarding Community Involvement. The comments inquire into how the public will stay informed. One comment was submitted twice, this comment is referred to as “duplicate comment” in the table below and italicized and within parentheses within the text. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Community Involvement			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
A9	<i>Q9</i>	X	X
N2		X	X
N2.2		X	X
V.1-8		X	X

COMMENTS SPECIFIC TO COMMUNITY INVOLVEMENT

- **Comment A9 (Q9).** “In the past MDEQ has not done a good job in keeping the public and particularly the nearby residents informed as to what is going on. Will that improve? How will that improve?”
- **Comment N2.** “Will the public be able to comment on this O and M plan? If so, when and how? If not, why not? How will MDEQ keep the public informed?”
- **Comment N2.2** “Will modifications to the community involvement plan for Montana Pole Plant be made post-ESD? If so, how? If not, why not given that this is a significant change that would warrant a change in the community involvement plan for the site post-ESD?”
- **Comment V.1-8.** “Community outreach activities by MDEQ have been abysmal.”

RESPONSE TO COMMENTS SPECIFIC TO COMMUNITY INVOLVEMENT

Overall Response to Comments A9 (Q9); N2; N2.2; V.1-8: The MT Pole Community Involvement Plan (MT Pole CIP) was updated in 2017 specifically in response to public feedback, from both community members and local officials, about the MT Pole site (*Community Involvement Plan, Montana Pole and Treating Plant Superfund Site*, DEQ, 2017). DEQ is currently following the MT Pole CIP to include the public in the next phase of the remediation. After listening to public feedback, DEQ recognized additional avenues of notification that would supplement previous outreach methods were needed, including neighborhood-focused outreach efforts. Current outreach actions include public notices, fact sheet mailings, email notifications, public meetings, social media, and press releases. Future activities at MT Pole will continue to follow the MT Pole CIP. Outreach actions for the 2020 Draft ESD included fact sheet mailings and email notifications to surrounding neighborhoods and to DEQ’s MT Pole mailing list, a formal public comment period, public meetings and presentations, public notices about the ESD comment period and public meetings in the Montana Standard, social media, and press releases. The community will have opportunities to provide feedback within the next five-year review in 2021. These avenues will supplement, not replace, previous outreach methods.

Specific Response to Comment A9 (Q9): DEQ appreciates the candid feedback. We updated the MT Pole CIP to improve and expand our community involvement efforts. We continue to value community involvement moving forward with the ESD and future activities at MT Pole.

Specific Response to Comment N2: No, there will not be a formal comment period for the MT Pole Operation and Maintenance Plan (O&M Plan) because the O&M Plan is a living document and can be revised. However, the O&M Plan is a public document that is easily accessible to the public and can be commented on at any time. DEQ will ensure that the O&M Plan is posted to the MT Pole webpage at the DEQ website. The Citizens' Technical Environmental Committee (CTEC) is available to assist the public with any concerns regarding the O&M Plan and help communicate such concerns to DEQ; reviewing technical documents and providing public outreach for technical documents is a primary function for Technical Advisory Groups such as CTEC.

Specific Response to Comment N2.2: One of the specific activities of a Superfund Community Involvement Plan is to “Inform the public of progress being made to implement cleanup remedies”. The recently updated MT Pole CIP, as demonstrated during the ESD public outreach actions, is designed to keep the community informed and involved. The ESD is a part of the overall MT Pole remedy and fits under the umbrella of the MT Pole CIP.

Specific Response to Comment V.1-8: DEQ appreciates the candid feedback. We updated the MT Pole CIP to improve and expand our community involvement efforts. We continue to value community involvement moving forward with the ESD and future activities at MT Pole.

DIOXIN AND OTHER COCS

COMMENT SUMMARY

Eight original comments were received regarding dioxin and other contaminants of concern (COCs). Two are regarding PCP leaching to groundwater (S10, T10). Six are regarding dioxin toxicity, mobility, and cleanup options (G10 (V.2-10), J6 (V.1-25), V1, V.1-11, V.1-14, V.4-1). Seven comments were received not specific to the 2020 Draft ESD and were previously submitted to and addressed by the Fourth Five-Year Review (E5 (V.5-1), G1 (V.2-1), G8 (H1, J4, K8, V.1-13, V.1-23, V.2-8, V.3-1), G12 (K5, V.2-12), G13 (K6, V.2-13), G16 (V.2-16), J5 (V.1-24)). Responses to these previous comments are located in Appendix B. Two comments were submitted twice, these comments are referred to as “duplicate comment” in the table below and italicized and placed within parentheses within the text. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Dioxin and other COCs			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
G10	<i>V.2-10</i>		X
J6	<i>V.1-25</i>	X	X
S10			X
T10		X	X
V1		X	X
V.1-11		X	X
V.1-14			X
V.4-1			X

COMMENTS SPECIFIC TO PCP LEACHING TO GROUNDWATER

- **Comment S10.** “The 1993 ROD did not address nor establish remedial action goals for management of soils at, or near, the ground surface containing concentrations of PCP that are below the criteria for human health exposure, but high enough to potentially impact groundwater via leaching of PCP. Restoration of groundwater quality is not a remedial goal for the MPTP Site, as groundwater is not used for water supply, and residential use of the Site is prohibited. Further, groundwater extraction and treatment are key components of the Site remedy that will remain in place indefinitely if the 1 ug/L PCP performance standard in groundwater is not achieved.”

“As identified in the ROD, the point of compliance for organic contaminants in groundwater is at the waste management area boundary (i.e., the edge of the excavated area) and the south bank of Silver Bow Creek. If the groundwater system is not effective to contain water within these boundaries, then the groundwater system should be improved to provide for effective capture of residual PCP and other organics in groundwater beneath the Site. However, AR has not seen evidence demonstrating that the groundwater system is ineffective or that it requires improvement.”

“Based on an analysis provided in Attachment C to the ESD, the agencies are proposing to lower the concentration of PCP in soils that requires management to 2,000 ppb – a significant reduction from the 34,000 ppb required under the 1993 ROD and the 7,000 ppb level that would be required based on the ESD’s updated human exposure risk evaluation. The ESD states that this change would not fundamentally alter the approach, performance, or cost of managing soils because the 1993 ROD incorporated a component of surface grading and revegetation or covering with suitable soil. The agencies have not provided a detailed cost analysis (e.g., the volume of saturated and unsaturated soils that would be excavated and placed in the CAMU) that supports the agencies’ cost conclusion. Moreover, in addition to soil in the LTU that may be above the lowered cleanup criteria, this change also could require excavation of additional soil in areas outside the LTU, increasing the overall amount of soil that needs to be excavated/managed in the CAMU long-term.”

“The additional soil removal cost is likely to result in little or no improvement in remedy protectiveness, as it is unlikely to result in achieving the 1 ug/L PCP standard in groundwater beneath the Site, and institutional controls are already in place to prevent use of Site groundwater for domestic use. Furthermore, residual contamination remaining beneath the Interstate and in soils placed within the CAMU is likely to contribute additional PCP concentrations in groundwater at the Site (see comments on Attachment C, below).”

“The proposed excavation of additional soil, with redisposal in a CAMU on Site, will not prevent off-site migration of contaminated groundwater into the BPSOU (if the groundwater extraction and treatment system is taken offline), or improve the protectiveness or the groundwater remedy. Regardless of whether the proposed work is conducted or not, it will be necessary to operate and maintain the on-site groundwater extraction and treatment system for the foreseeable future, indefinitely, to effectively capture and treat Site groundwater, and to prevent off-site migration of contaminated groundwater into Silver Bow Creek, BPSOU, and points downstream.

“The Attachment C evaluation needs to consider other on-site sources of groundwater contamination. The remaining sources include at least material beneath the Interstate and the source within the CAMU. AR further suggests that DEQ implement the planned remedy for the Interstate area, and assess the extent to which the selected remedy reduces PCP concentrations in

soils, before deciding whether it is necessary to change the remedy action levels, as proposed in the ESD.”

- **Comment T10.** “The table in Attachment C, section 3.0 Summary of Lines of Evidence shows range of soil PCP concentration for #5 to be 14.0 to 26.9 but the text above states “LTU soils ranged from 14 to 34 mg/kg.” It also is not clear how these soil concentrations which resulted in a median leachate PCP concentration of 25 µg/L is safe when the ROD groundwater cleanup level is 1 µg/L.”

RESPONSE TO COMMENTS SPECIFIC TO PCP LEACHING TO GROUNDWATER

Overall Response to Comments S10; T10: DEQ disagrees. The intent of adding a protection-to-groundwater cleanup number is to ensure the protectiveness of the remedy in the future. It is not intended to address existing groundwater contamination or enhance the present groundwater treatment system.

Presently the groundwater remediation requires ongoing pump-and-treat activities. The existing groundwater treatment plant is expected to continue operating for approximately 30 years. After completion of the ESD associated construction, the plan is to explore additional groundwater treatment technologies. These other groundwater treatment technologies could significantly reduce subsurface contamination sources to the groundwater, such as the soil and groundwater contamination under the interstate, reducing the time and cost needed to operate the water treatment plant. Once this goal is achieved, protection of groundwater will be relevant to protecting the remedy.

The scope of additional soil removals is focused on the remaining surface soils (top 2 feet) that exceed the proposed cleanup level of 2,000 µg/kg for PCP and 0.03 µg/kg for dioxin. Based on the *Final Soil and Surface Water Data Gap Investigation Report* (DEQ, November 2017), DEQ anticipates removals of contaminated soils (>2,000 µg/kg) will not exceed 2 feet in depth in most areas around the CAMU. These soils would be in addition to the treated soils off-loaded from the land treatment unit (LTU). The total volume of non-LTU soils is approximately 23,000 cubic yards. Estimated costs for removing this material, placing it in the CAMU, and capping it are \$691,000.

Specific Response to Comment T10: DEQ reviewed the records database and confirmed that the table has the correct PCP concentration. The 2020 Draft ESD proposes all soils exceeding the new screening level of 2,000 µg/kg (equivalent to 2 mg/kg) will be moved to the CAMU. The ESD does not state (or provide inference) that the soils with PCP concentrations of 14 to 34 mg/kg are protective of groundwater, which is why they will be moved to the CAMU.

COMMENTS SPECIFIC TO DIOXIN TOXICITY, MOBILITY, AND CLEANUP OPTIONS

- **Comment G10 (V.2-10).** “Study by U.S. Dept of Agriculture indicated that dioxin is only immobile in soils devoid of other organic material. If any organic co-solvents as are present at the Pole Plant are in the soil, mobility will occur. If, as we find at the Pole Plant, co-contaminates are present, dioxin does become mobile in soil.”

Imminent is defined as: “Near at hand; mediate rather than immediate, close rather than touching, perilous.” Substantial is defined as of “Importance.” Certainly, dioxin left in place at the Montana Pole Plant site would present a potential threat and a substantial, imminent threat as defined in Black’s Law Dictionary.”

- Comment J6 (V.1-25).** “At a minimum the following needs to be done:

“1. Check and double check the feasibility of using bio-remediation to treat the dioxin. This is what was mandated in the ROD for the Pole Plant. This approach would clean up the site of dioxin by treating the dioxin and would reduce the toxicity, mobility and volume of the contamination. It would meet the Superfund mandate for permanence. It would meet the mandates of the Precautionary Principle and the Principle of Pollution Prevention which are part of state and federal law.”

“2. If bio-remediation is convincingly found to be impracticable, investigate other treatment modalities for the site.”

“3. Revisit the practicability of incineration.”

“4. Admit that dioxin is mobile in water and plan accordingly.”
- Comment V1.** “Dioxin has been and continues to be released from Montana Pole Plant into Silver Bow Creek. How much has been released from the Montana Pole Plant? Where is it now? What will be done to remediate it? How much contamination has been released from under the Interstate? Where is it now? What will be done to remediate it? What is the time table for addressing the contamination under the interstate? How significant a threat to human health and the environmental health of Silver Bow Creek is the dioxin that has been released? Has any attempt been made to assess the effects of the released dioxin? Is not, why not? When will water quality standards be met for the Pole Plant? Is there enough money to operate the water treatment plant for as long as it is need?”

“Dioxins also tend to accumulate in the body and are not easily expelled. Additional References: ATSDAR, December 1998, National Toxicology Program January 2001 and International Agency for research on Cancer, 1997. The tragic consequences of exposure to dioxin have been verified by the effects of Agent Orange on service personnel, Times Beach in Missouri and Love Canal in New York. Dioxin is Mobile at the Montana Pole Plant. This mobility compromises the protectiveness of any proposed caps at Montana Pole Plant. This mobility is demonstrated by technical/scientific literature on the subject as well as statements by EPA and MDEQ specifically regarding the Pole Plant.”

“Dioxin is mobile in soils such as those at the Montana Pole Plant. The ROD for Montana Pole itself says that it is possible for dioxin in soils to migrate. (Page 14) There are present in the Montana Pole Plant soils co-contaminants that can mobilize dioxin. In addition, the caps as presently proposed will not prevent surface water and other contaminants from leaching down and mobilizing dioxin. Given the problems of caps with bio-irrigation, advection, desiccation, erosion, weathering, bio-intrusion and stabilization, the dioxin in the soil will be mobilized. Only in a pure lab setting does dioxin remain non-mobile. Certainly the Montana Pole Plant is not a pure lab setting. (See: Dioxin reservoirs in southern Viet Nam—A legacy of Agent Orange by Divernychuk, et al in Chemoshpere 47 (2002) 117-137.”

“Also, data presented by the MDEQ at a CTEC meeting indicated that dioxin is present in the recovery trenches at the Pole Plant. If dioxin isn’t mobile in soil at the Pole Plant, how did the dioxin get in the recovery trenches? Another point that was made at the CTEC meeting: MDEQ is in charge of the cleanup in Missoula of the White Pine Sash site. This site was a wood treatment facility similar to Montana Pole. The MDEQ acknowledges at this site that dioxin can be mobile in soils. Why not acknowledge the same at Montana Pole? Finally, the dioxin levels that we are now seeing in groundwater at the Montana Pole Plant were not supposed to have been reached until 200,000 years from now according to MDEQ. Why, if dioxin is not mobile, are we seeing dioxin now that we should not have seen for 200,000 years?”

- **Comment V.1-11.** “As I said, the current proposal is to leave dioxin in place at the site. Why is this so problematic? Because dioxin is highly toxic and there are no safe levels of exposure to dioxin. The current waste left in place solution is unlikely to protect present and future generations from exposure to the dioxin at the Pole Plant. The MDEQ proposed solution is unlikely to protect human health and the environment.”
- **Comment V.1-14** “The World Health Organization states: “Dioxins are highly toxic. They belong to the so-called ‘dirty dozen’—a group of dangerous chemicals known as persistent organic pollutants. Dioxins are of concern because of their highly toxic potential. Experiments have shown they affect a number of organs and systems.” (Dioxins and their effects on human health, WHO, October 2016) “Dioxins are a group 1 human carcinogen.” (Smith and Lpipero “Invited Commentary: How Do the Seveso Findings Affect Conclusions Concerning TCDD as Human Carcinogen?,” American Journal of Epidemiology, June 2001.)”
- **Comment V.4-1.** “Health Effects”
 “The dioxin TCDD, or Mutagen: Talking Glossary of Genetic Terms, is a known cancer-causing agent, and other DLCs are known to cause cancer in laboratory animals. Additionally, dioxin exposure has been linked to a number of other diseases, including type 2 diabetes, ischemic heart disease, and an acne-like skin disease called chloracne, a hallmark of dioxin exposure.”

“Dioxins can cause developmental problems in children, lead to reproductive and infertility problems in adults, result in miscarriages, damage the immune system, and interfere with hormones.”

“Exposure to dioxins has widespread effects in nearly every vertebrate species, at nearly every stage of development, including in the womb. National Institute of Environmental Health Science. Medical News Today.”

“Problems that have been linked to dioxins exposure include: birth defects, inability to maintain pregnancy, decreased fertility, reduced sperm count, endometriosis, learning disabilities, immune system suppression, lung problems, skin disorders, lowered testosterone levels, ischemic heart disease, type 2 diabetes”

RESPONSE TO COMMENTS SPECIFIC TO DIOXIN TOXICITY, MOBILITY, AND CLEANUP OPTIONS

Overall Response to Comments G10 (V.2-10); J6 (V.1-25); V1; V.1-11; V.1-14; V.4-1: DEQ and EPA recognize the serious health risks of the wood treating wastes at MT Pole. PCPs, dioxin, and some PAHs are known or suspected human carcinogens. The 1993 ROD site-specific cleanup levels (SSCLs) for recreational use were calculated based on an incremental lifetime cancer health risk of one in one million (1×10^{-6}).

This 2020 Draft ESD remains consistent with the cancer risk level of 1×10^{-6} while recalculating SSCLs with the most current toxicity data to include the more protective industrial/commercial use scenario. Future land use will be restricted to areas of MT Pole where it is demonstrated that the ESD proposed cleanup levels are met. The CAMU will prevent human health risks from soils exceeding the updated ESD cleanup levels, by capping those soils permanently.

Dioxin are found in by-products of manufacturing such as wood treating (PCP), pesticides, and heated bleach from pulp mills. When exposed to carrier fluids like diesel or dissolved PCP, dioxin will move with the carrier fluids. Wood treating sites with PCPs, petroleum (carrier fluids), and dioxin in the soil, also have the wood treating contaminants in the groundwater. The recovery trenches at MT Pole, especially the trench next to the interstate, continue to take in oily PCP that also contains dioxin. Once that carrier fluid is removed or substantially reduced, the dioxin will stick to the soil. Without the other contaminants, it will not move or migrate with the groundwater.

Specific Response to Comment J6 (V.1-25): The remedy at the MT Pole Site is active remediation through biological treatment. Biological treatment achieved the ROD cleanup levels for PCPs and PAHs. While biological treatment reduced dioxin concentrations significantly, the soil cleanup level for dioxin was not achieved. The 2020 Draft ESD proposed change to manage soils with dioxin concentrations above the proposed soil cleanup level in a CAMU is consistent with both the EPA guidance for dioxin and the ROD because such an approach enhances the containment by using an engineered cap to prevent exposure to the contaminated soils.

Specific Response to Comment V1: Water treatment plant discharge and surface water have consistently met ROD cleanup levels since 2001. The discharge for dioxin has met the ROD cleanup level 100% of the time. The ROD cleanup level for dioxin is also EPA’s National Primary Drinking Water Regulation/Maximum Contaminant Level (MCL) for dioxin. All surface water dioxin samples since testing began in 2006 also meet the ROD dioxin standard for surface water.

Specific Response to Comment V.1-11: The 2020 Draft ESD proposed change to manage soils with dioxin concentrations above the proposed soil cleanup level in a CAMU is consistent with both the EPA guidance for dioxin and the ROD because it enhances the containment by using an engineered cap to prevent exposure to the contaminated soils.

ESD FORMATTING

COMMENT SUMMARY

Two comments were received regarding the ESD Formatting (S4 and T8). For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

ESD FORMATTING			
Comment ID	Duplicate Comment ID	Specific Response	Overall Response
S5		X	
T8		X	

COMMENTS SPECIFIC TO ESD FORMATTING

- **Comment S5.** “Table 1 in Section 3.1 of the ESD compares cleanup levels for human exposure from the 1993 ROD with those in the ESD, referencing a DEQ technical memorandum in Attachment B to the ESD as a source reference for the ESD values. However, several of the values in Table 1 do not correspond with the values actually presented in Attachment B, and thus the changes proposed in the ESD are not consistent with the technical document cited to support them. Furthermore, the 1993 ROD does not present separate cleanup levels for industrial exposure at 1×10^6 . The 1993 ROD

only presents the risks for industrial exposure at the selected cleanup levels. In the proposed and final ESD, Table 1 should be revised consistent with Attachment B, as provided in Table 1 below.”

Table 1 – Comparison of 1993 ROD and ESD Soil Cleanup Levels for Human Exposure

Chemical	1993 ROD Cleanup Level	ESD Cleanup Levels (Bold)	Basis for Cleanup Level* (1993 ROD and ESD)
Concentration (µg/kg)			
Pentachlorophenol	34,000	34,000 36,000	Recreational exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)
	9,000 NC	7,000	Industrial exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)
	None	2,000*	Leaching to groundwater ^d (1 x 10 ⁻⁶ carcinogenic risk)
Dioxins/Furans (TEQ) ^e	0.2	0.1	Recreational exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)

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	0.03 NC	0.03* 0.04*	Industrial exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)
Carcinogenic PAHs (TEQ) ^b	4,200	4,200 2,000	Recreational exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)
	700 NC	700* 500*	Industrial exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)

Notes: **NC = not calculated**; ESD = explanation of significant differences; µg/kg = microgram/kilogram; PAH = polycyclic aromatic hydrocarbon]

- **Comment T8.** “Figure 1” and “figure two” are referenced several times in the main body of the ESD but are not included.

RESPONSE TO COMMENTS SPECIFIC TO ESD FORMATTING

Specific Response to Comment S5: ESD Attachment B *DEQ Memos (6-3-2016 & 10-3-2017) Regarding Soil Cleanup Levels* should have contained two memos. The second memo from October 2017 was inadvertently omitted. DEQ will update Attachment B to include both the June 2016 and the October 2017 memorandums, which include the correct information. This omission does not change the proposed cleanup levels in Table 1. A footnote will be added to Table 1 to reflect the information from the two memos.

Specific Response to Comment T8: The Figures were inadvertently omitted and will be included in the final ESD.

FIVE-YEAR REVIEW

COMMENT SUMMARY

One original comment received regarded the Fourth Five-Year Review (L1). Two comments were received not specific to the ESD and were previously submitted to and addressed in the Fourth Five-Year Review (G6 (V.2-6), G15 (V.2-15)). Comments G6 (V.2-6), G15 (V.2-15) and the responses are located in Appendix B. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Biological Treatment			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
L1		X	

COMMENT SPECIFIC TO FIVE-YEAR REVIEW

- **Comment L1.** “Five-year reviews of the Montana Pole Plant constantly point to failures of the remedy to meet remediation targets. What assurances does the public have that these cleanup targets will be met in the future?”

“Specifically, where in the ESD can MDEQ point to deficiencies noted in the last and previous Five Year Review of the Montana Pole Plant that have been corrected? Please be as specific as possible. If they have not been corrected, why? What will be done in the future to correct these deficiencies?”

RESPONSE TO COMMENT SPECIFIC TO FIVE-YEAR REVIEW

Specific Response to Comment L1 Biological treatment has achieved the ROD cleanup levels for PCPs and PAHs. While biological treatment reduced dioxin concentrations, the dioxin cleanup level was not achieved. Therefore, the 2020 Draft ESD-proposed change to manage soils with dioxin concentrations above the soil dioxin cleanup level in a CAMU is consistent with both the EPA guidance for dioxin and the ROD because it enhances the containment by using an engineered cap. The ESD is continued progress to meet remediation targets through proposed changes to the remedy with more protective cleanup levels than those included in the ROD.

Since 2001, water treatment plant discharge and surface water consistently meet ROD cleanup levels. The water treatment plant discharge meets the ROD dioxin cleanup level 100% of the time. The ROD cleanup level for dioxin is also EPA’s National Primary Drinking Water Regulation/MCL for dioxin. All surface water dioxin samples taken since testing began in 2006 also meet the ROD dioxin standard for surface water.

The remainder of this response is organized into two parts. Part One addresses items completed since the Third Five-Year Review. Part Two provides the status to the other recommendations found in the Third and Fourth Five-Year Reviews.

Part One – The following recommendations from the Third Five-Year Review are complete:

- Modify the existing Controlled Groundwater Area established in October 2009 to address significant increases in groundwater withdrawals from existing infrastructure that are planned in the vicinity of the Site.
- Remove PCP contaminated soil beneath power poles.

Part Two – The following recommendations from the Third and Fourth Five-Year Reviews are partially complete with current status provided:

- Clarify the points of compliance for groundwater to reflect the current configuration of Silver Bow Creek, the current PCP plume distribution, and the updated conceptual site model.

Current Status – A monitoring plan revision implemented in 2013 revised compliance points for current monitoring. DEQ will finalize compliance points once DEQ completes the forthcoming groundwater design data gap investigation.

- Develop and implement permanent institutional controls (ICs) to prevent future on-Site residential use and restrict land use where waste has been left in place above levels that allow for unlimited use/unrestricted exposure. Note: This is also identified in the Fourth Five-Year Review.

Current Status – Once the off-load design is finalized, a final determination of land use will be made so the ICs can be customized as needed. Along with the groundwater control area currently in place, an IC (deed restriction) will be implemented to prevent residential development as needed. Some deed restrictions are already in place for MT Pole site property. The CAMU will also receive an IC in the form of a deed restriction that will be administered by DEQ.

- Through the appropriate decision document, adopt the August 2010 DEQ-7 chronic value for cadmium as a cleanup standard.

Current Status – The revised chronic standard does not require a change to the selected remedy because it meets the modified chronic value for cadmium, as well as the standard identified in the ROD.

- The Fourth Five-Year Review also identifies “updates to certain ROD cleanup or discharge standards should be evaluated, revised, and incorporated as appropriate.”

Current Status – In the ESD, DEQ internally evaluated potential updates to the site-specific cleanup levels for human exposure to soil. The updates can be found in Table 1 of the 2020 Draft ESD.

Groundwater and surface water cleanup and discharge standards will be evaluated once the forthcoming groundwater design data gap investigation is completed. Other remedy items such as remaining sources of PCP will also be addressed at that time. The groundwater and surface water updates and/or proposed changes to the ROD will be found in a subsequent decision document.

FUNDING

COMMENT SUMMARY

Nine original comments were received regarding Funding. Two comments ask where additional funding for the water treatment plant and for the cleanup under the interstate will come from (A1 (Q1), J10 (V.1-29)), one addresses the cash out site (A8 (Q8)), and six comments generally address the topic of funding (S3, S13, J8 (V.1-27), V.1-2, V.1-6, V.1-21). Some comments were submitted twice, these comments are referred to as “duplicate comment” in the table below and italicized and placed within parentheses within the text. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Funding			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
A1	Q1		X
A8	Q8	X	X
J8	V.1-27		X
J10	V.1-29		X
S3		X	X
S13		X	X
V.1-2			X
V.1-6		X	X
V.1-21		X	

COMMENTS SPECIFIC TO FUNDING

- **Comment A1 (Q1).** “MDEQ estimates that it will take 50 years to remove all the petroleum based pollutants out of the groundwater. There is money to operate the water treatment plant at the Pole Plant for only 30 years, given that the Pole Plant is a cash out site. So where will MDEQ get the money to operate the water treatment plant for the additional 20 years that it will need to operate to remove all the petroleum based pollutants out of the groundwater?”
- **Comment A8 (Q9).** “This is a cash out site with very limited money for cleanup and no practical source for more. Is there enough money in the “pot” to adequately clean up and maintain the site? Earlier I raised the issue of insufficient funds to operate the water treatment plant for as long as it is needed.”
- **Comment J8 (V.1-27).** “6. Clearly articulate from where the additional money that will be needed for the cleanup will come.”
- **Comment J10 (V.1-29).** “9. Articulate a comprehensive plan for dealing with contamination under the interstate and indicate what will be the source of money.”
- **Comment S3.** “On multiple occasions, the draft ESD posits that the proposed changes will not fundamentally alter the costs associated with the MPTP remedy. For example, the ESD states “[c]ost increases incurred by adding the CAMU are unlikely to make the remedy exceed five percent of the costs estimated in the ROD.” ESD at 10; see also id. At 11, 13, tbl. 2. However, other than the agencies’ blanket assertions that costs will not materially increase due to the proposed changes, the ESD contains no meaningful analysis or documentation to support the ESD statements regarding costs.”

“The agencies are required to properly and adequately assess costs associated with post ROD changes. See 40 C.F.R. § 300.435I(2); see also ROD Guidance, §§ 7-2 and 7-3. The proposed and any final ESD should both include a more fulsome analysis of costs associated with the MPTP remedy changes, as well as documentation to support such an analysis. Further, as discussed above, if the more-detailed cost analysis demonstrates that the changes will significantly increase costs associated with the MPTP remedy, it may require a ROD amendment, rather than an ESD (see General Comment #1, above).”

- **Comment S13.** “The ESD updated the scope of engineering and institutional controls to include construction of a CAMU rather than “surface grading and revegetation or suitable soil cover” to manage treated soils offloaded from the LTU. The draft ESD also requires incorporation of additional soils from outside the LTU into the CAMU if they exceed the proposed dioxin and PCP soil cleanup levels. The ESD acknowledges that these changes alter the scope and cost of the selected remedy in the 1993 ROD. The ESD concludes that the cost impact of adding the CAMU would likely be small (i.e., unlikely to make the remedy exceed 5% of the costs included in the ROD – see last sentence of ESD Section 3.2).”

The ESD does not present the information necessary to understand the cost impact or benefit of constructing a CAMU in the manner proposed by the agencies. Further, detailed information to support the calculated volume of additional soil volume that may be generated by the lowering of soil cleanup levels are not provided. The ESD should be updated and revised to include details of the agencies’ cost / benefit analysis that supports the decision to require a CAMU rather than grading and revegetating the Site as described in the ROD (see also, e.g., General Comment #3). AR may have further comments after that proposed work is complete.

- **Comment V.1-2.** “2. The state will run out of money before the remedy is finished and the state refuses to specify from where additional funds will come. All we are given are paternalistic assurances that all is ok.”
- **Comment V.1-6.** “6. The Cost of Remedy Superfund balancing criteria has been totally misapplied by MDEQ.”
- **Comment V.1-21.** “MDEQ has totally misapplied this criterion. According to EPA, cost should not drive Superfund remedies. The way cost is supposed to influence Superfund decision making is that the determination is first made as to what plan of action will best protect human health and the environment and then the most cost-effective, i.e. efficient way of accomplishing this goal is selected. Preference should not be given to the cheapest remedy. With regard to the Montana Pole Plant, MDEQ has let cost considerations subvert the protectiveness of the remedy. This is a total perversion of the Superfund decision making process. Butte has, in large part because of cost considerations, had to settle for a below par remedy at Montana Pole Plant.”

RESPONSE TO COMMENTS SPECIFIC TO FUNDING

Overall Response to Comments A1 (Q1); A8 (Q8); J8 (V.1-27); J10 (V.1-29); S3; S13; V.1.2; V.1-6: DEQ and EPA anticipate that the existing funds will be sufficient to completely address the cleanup activities and objectives outlined in the ROD as amended by this ESD, including but not limited to water treatment plant operation, contaminated soils underneath the interstate, O&M, and exploring new soil and groundwater in-situ treatment technologies.

Sufficient funds exist to continue the active pump-and-treat remedy for impacted groundwater, from sources such as underneath the interstate, for approximately 30 years. However, as the contaminated groundwater in the excavated areas continues to be effectively reduced, DEQ plans to explore additional soil and groundwater in-situ treatment technologies. These treatment technologies could significantly reduce the remaining subsurface contamination sources (including the inaccessible contamination under the interstate), and therefore, reduce the time and cost needed to operate the water treatment plant.

The exploration and selection of in-situ biological treatments for contaminated groundwater and soil in inaccessible areas are components of the selected remedy (*Section IX SELECTED REMEDY, RECORD OF DECISION MONTANA POLE AND TREATING PLANT NATIONAL PRIORITIES LIST SITE*, September 1993). This work is anticipated to commence shortly after the completion of the construction described in this ESD.

Specific Response to Comment A8 (Q8): DEQ and EPA will ensure, either through a separate O&M trust account or similar, that existing funds are in place to meet O&M requirements for all current and planned remedial components at the MT Pole site.

Specific Response to Comment S3 and S13: All additional remedial actions described in the ESD are estimated to cost an additional \$1.3M (*Preliminary Cost Estimates for Proposed Changes to the Montana Pole and Treating Plant Selected Remedy*, Tetra Tech, November 2020), which compared to the \$34M spent by the agencies on the remedy since the 1996 ROD settlement (which does not include water treatment plant construction costs) is less than 4%. The minor cost increase results in significantly improved protectiveness for recreational and commercial reuse of the property.

Specific Response to Comment V.1-6: See ***Specific Response to Comment V.1-21 below.***

Specific Response to Comment V.1-21: The substantive changes proposed in the ESD are based on protecting human health and the environment and compliance with the ARARS found in the ROD. Sections 3.2, 3.3, and 3.5 of the ESD carefully outline the substantive changes and the rationale behind each change. *Table 2 – Summary of Significant Differences Identified in this ESD* also identifies the impact that the changes have on Remedy Scope, Performance, and Cost. Finally, in ESD Section 5.0, DEQ and EPA acknowledge that the necessary statutory determinations have been met for these substantive changes.

REMEDY - CAPPING

COMMENT SUMMARY

Thirteen original comments were received regarding the Remedy of Capping. Two comments are specific to the Corrective Action Management Unit (CAMU) Rule (M1, N1); seven comments are specific to the Cap Design (A4 (Q4), E3 (V.1-12), T3, J7,O1, P1, P2, V.1-1); and three of the comments are not subcategorized (S9, T1, T4). Six comments were not specific to the ESD and were previously submitted to and addressed by the Fourth Five-Year Review (D1 (H3, V.1-15, V.3-3, V.7-1), G3 (V.2-3), G14 (K7, V2-14), H2 (V.3-2), H4 (V.3-4), K3). Comments D1 (H3, V.1-15, V.3-3, V.7-1), G3 (V.2-3), G14 (K7, V2-14), H2 (V.3-2), H4 (V.3-4), and K3 and their responses are located in Appendix B. Some comments were submitted twice, these comments are referred to as “duplicate comment” in the table below and italicized and placed within parentheses within the text. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Cleanup and Cleanup Levels			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
A4	Q4	X	X
E3	V.1-12	X	X
J7	V.1-26	X	X
M1			X
N1		X	X
O1			X
P1		X	X
P2		X	
S9		X	X
T1		X	X
T3			X
T4		X	X
V.1-1			X

COMMENTS SPECIFIC TO THE CORRECTIVE ACTION MANAGEMENT UNIT (CAMU) RULE

- **Comment M1:** “What assurances can you give that the proposed CAMU for Montana Pole Plant that the ESD mandates and requires complies with the provisions of the following: 40 CFR Parts 260, 264, and 271Amendments to the Corrective Action Management Unit Rule; Final Rule (2002) and40 CFR Parts 260,264,26.5,268,270 and 271 [FRL4555-71 which still pertain to CAMUs. If not, why not? Please be specific in your response.”

“Can it be demonstrated that the proposed CAMU for Montana Pole Plant complies with all the rules, regulations and guidance documents issue pursuant to these rules regarding the use, construction, monitoring and maintenance of CAMUs? Please do so. If not, why not?”

- **Comment N1.** “Specifically, in regard to the proposed CAMU at Montana Pole Plant, how were the seven decision criteria that apply to CAMUs under 40 CFR 264.552(c) applied and realized? I would request that each of the seven be addressed individually.”

“Under 40 CFR 264.552(d), the owner/operator of the CAMU is required to submit all the necessary information and documentation. How does MDEQ plan to comply with this section? Who will submit the paperwork? Who will prepare it?”

In general, how does MDEQ plan to address the criteria for CAMUs in 40 CFR 264.552? “The literature on CAMUs stipulate that it is vital that use of and access to CAMUs be strictly controlled. Is the planned recreational use of the CAMU site compatible with the protectiveness of the remedy? Would trails on the CAMU be safe? Could recreational use compromise the remedy? What will be done to prevent this from taking place?”

“The CAMU is only as good as its operation and maintenance? Has MDEQ developed a detailed and specific operation and maintenance plan for the CAMU post ROD ESD?”

RESPONSE TO COMMENTS SPECIFIC TO THE CORRECTIVE ACTION MANAGEMENT UNIT (CAMU) RULE

Response to Comments M1; N1: The proposed CAMU for the MT Pole site complies with provisions of the federal and state CAMU rules as follows: Montana has adopted the federal CAMU rules in the Administrative Rules of Montana (ARM) without changes and EPA has given authorization to DEQ to implement the CAMU rules; the substantive provisions of the CAMU rules are considered by EPA to be ARARs for certain CERCLA remediation sites where appropriate; specific criteria set forth in the regulations were evaluated to determine that the proposed CAMU met regulatory requirements, and DEQ will implement an operations and maintenance plan designed to meet the substantive provisions of CAMU operation, closure, and post-closure requirements.

In 1993, EPA promulgated regulations governing CAMUs. 59 Fed. Reg. 8658 (2/16/1993). In 2002, EPA amended the 1993 rule as a result of a settlement agreement on pending litigation. (67 Fed. Reg. 2962 (1/22/2002)).

DEQ, as lead agency, has the authority to designate an area at the MT Pole site as a CAMU. The state of Montana’s hazardous waste program is equivalent to, or more stringent than, the federal program for the management of hazardous wastes pursuant to 40 CFR 271.4. The Montana Hazardous Waste Act (MHWA) provides the authority to develop administrative rules "which are necessary to obtain and maintain authorization under the federal [hazardous waste] program" and which, with certain exceptions, are not "more restrictive than those promulgated by the federal government under the Resource Conservation and Recovery Act of 1976, as amended...." Section 75-10-405(1)(o) and (2), Montana Code Annotated (MCA). The MHWA states that DEQ may adopt rules fully equivalent to the federal regulations and obtain program authorization so that hazardous waste issues will "be addressed and controlled by the state rather than by the federal government." Section 75-10-402(2), MCA.

40 CFR 271.21(e) requires an approved state to revise its authorized program to incorporate modifications made in the federal regulations. Montana has revised its hazardous waste rules on numerous occasions since 1983 both to implement the legislative intent for more stringent provisions reflected in § 75-10-405(2), MCA, and to update the state program with the changing federal regulations. DEQ incorporated by reference 40 CFR Sections 260 through 270 in an adoption notice published on 10/31/2002. This incorporation by reference included the federal promulgated CAMU regulations of 1993 and as amended in 2002. EPA reauthorized the Montana Hazardous Waste Program on 11/29/2005. EPA’s authorization included the CAMU regulations.

As noted in the preamble to the 1993 CAMU rule, the substantive requirements of the CAMU regulations are expected to be ARARS for remediation of CERCLA sites where remediation involved hazardous wastes. The substantive provisions of CAMU regulations that are designated as ARARS would be incorporated into CERCLA decision documents, rather than RCRA permits or orders (see 58 Fed. Reg. 8679). DEQ is the lead agency for the MT Pole Site, as consistent with CERCLA, and has the authority to designate the proposed CAMU under the MT Pole ROD.

To be designated as such, a CAMU must meet specific location and operational requirements. In addition, waste must meet specific criteria to be eligible for placement in a CAMU. 40 CFR Part 264, subpart S, as incorporated by reference in the Administrative Rules of Montana (ARM) 17.53.801, sets forth the requirements for designation and operation of a CAMU, and for CAMU-eligible wastes. DEQ evaluated whether the proposed CAMU at MT Pole met the criteria set forth in 40 CFR 264.552, as incorporated by reference in ARM 17.53.801. This evaluation is included in DEQ's *CAMU Designation* document (ESD Attachment E), dated April 5, 2019. The evaluation includes detailed analysis of the proposed CAMU location, waste type, and concentrations of principal hazardous constituents within the waste. DEQ also notes in the evaluation that an operations and maintenance plan will be developed to ensure that operations, closure, and post-closure activities are in compliance with the requirements of 40 CFR 264.552, as incorporated by reference in ARM 17.53.801.

DEQ points to the regulatory evaluation in ESD Attachment E which includes a detailed discussion of the sixteen criteria required in 40 CFR 264.552(a) and (c through e). Documents relevant to the proposed CAMU designation are included in the evaluation.

Specific Response to Comment N1: The option of recreational use for the designated CAMU area was considered, but determined to be inappropriate. A solar farm (light commercial/industrial use) within the area of the CAMU is being considered, along with deed restrictions prohibiting any other active use. Whether the CAMU area is used for a solar farm or limited to no use, access to the CAMU area will be limited to authorized personnel only and controlled by fencing.

COMMENTS SPECIFIC TO THE CAP DESIGN

- **Comment A4 (Q4).** "Dioxin is very dangerous. There are really no safe levels of exposure. MDEQ proposes to leave the dioxin on site, unremediated, with a cap. Caps in Butte have a very problematic history and we must remember that the contamination in the rest of Butte outside of the Pole Plant is nowhere near as toxic as the threat from dioxin. The proposal is to allow recreational use over the dioxin cap. Is that wise? Is that protective? How permanent is the proposed lining? On a recent tour I saw some of the present lining exposed to sunlight that degrades the cap. There are also unanswered issues regarding the long term maintenance of the cap. Is there enough money to maintain the cap?"
- **Comment E3 (V.1-12).** A. Dioxin is a deadly carcinogen that produces severe and serious health effects in addition to cancer. B. Contrary to the goal of Superfund to treat toxic waste instead of leaving it in place and to reduce the toxicity, mobility and volume of contaminants, MDEQ plans to cap the dioxin in place. C. The proposal by MDEQ to leave dioxin in place is not protective of human health and the environment because capping has serious problems. D. Because dioxin is mobile at the Pole plant, the caps will not be protective. E. The use of institutional controls at the site is very problematic. Problematic institutional controls threaten the release of dioxin at the Pole Plant. F.

The balancing criteria of cost has been misapplied by MDEQ resulting in leaving an unacceptable dioxin threat in place.

- **Comment J7 (V.1-26).** “5. If, as a very last resort, capping becomes the only alternative, mandate an ET cap.”
- **Comment O1.** “I would ask that the following be addressed. The CAMU cap has a limited lifespan, much shorter than the dioxin it is meant to cover. Some estimates are thirty to fifty years at best. What provisions are there for replacing the cap when needed? How will it be determined that the cap needs to be replaced? What exposure dangers are there when between the time the cap is discovered to be failing and the replacement of the cap? Who will pay? Will there be enough money?”

“CAMU caps often have problems regarding the establishment of ground vegetative cover, particularly in this climate. For example, how will the vegetative cover be irrigated? Will this irrigation lessen the protectiveness of the cap? What protocols are in place to protect the cap membrane from degradation due to sunlight, as well as chemical and biological degradation? How will this be monitored?”

“Small tears or punctures often occur when the soil cover is placed over the membrane, thus compromising the protectiveness of the cap. What will be done to prevent this from happening and to monitor the situation. How frequently will the capped be monitored as to performance? By whom? By what methodology? What about lateral infiltration due to rain? How will this be monitored and controlled? Will the cap be extended beyond the contaminated area to prevent this? How far will it be extended?”

“Are there sufficient protections to prevent the horizontal flow of groundwater through the waste? What specific provisions are in place to protect the CAMU from the effects of climate change that could threaten the site?”

- **Comment P1.** “Will the proposed CAMU and cap associated with it affect soil hydrology as has occurred at other sites? Will this affect the protectiveness of the entire remedy for Montana Pole Plant? Will this affect the protectiveness of the CAMU? Will altered soil hydrology create synergistic or cumulative effects on the protectiveness of the CAMU remedy?”
- **Comment P2.** “Could altered soil hydrology create other remedy problems for the site? Could altered soil hydrology affect end land use? Will altered soil hydrology potentially affect discharge into Silver Bow Creek?”
- **Comment T3.** “The ESD estimates that the repository cap will have a 40 mil HDPE liner, a geocomposite drainage net, and an earthen, vegetated engineered cover. The ESD states that the liner will be covered with an “earthen engineered cover that will prevent photodecay.” Regardless of the cover, plastic liners do decay. Generally, the lifespan of HDPE is from 100 years to over 400 years for plastic which is buried at cooler temperatures (Koerner et al. 2005; Rowe and Sangam 2002). The operation and maintenance (O&M) plan for the CAMU should include funding and monitoring for eventual replacement of the liner.”
- **Comment V.1-1.** “1. Bio-remediation has been abandoned in favor of another waste-in-place, i.e. threat left in place remedy of capping. This is contrary to Superfund policy that emphasizes

treatment over containment and emphasizes the reduction of the toxicity, volume and mobility of contaminants. Butte is to be left with another dead zone that will be off limits to development.”

RESPONSE TO COMMENTS SPECIFIC TO THE CAP DESIGN

Overall Response to Comments A4 (Q4); E3 (V.1-12); T3; J7 (V.1-26); O1; P1; P2; V.1-1: The remedy at the MT Pole Site is active remediation through biological treatment. Biological treatment achieved the ROD cleanup levels for PCPs and PAHs. While biological treatment reduced dioxin concentrations significantly, the soil cleanup level for dioxin was not achieved. The 2020 Draft ESD proposed change to manage soils with dioxin concentrations above proposed soil cleanup level in a CAMU is consistent with both the EPA guidance for dioxin and the ROD because it enhances the containment by using an engineered cap to prevent exposure to the contaminate soils. The CAMU is a more protective capping plan than originally appeared in the ROD.

Protecting the public from exposure to MT Pole dioxin will be achieved through careful design and construction of the CAMU. All the treated soils on site with concentrations of dioxin and PCPs greater than the ESD proposed cleanup levels will be consolidated in the CAMU. The CAMU will meet the relevant waste-specific performance standards (40 CFR § 264.552) for design, closure, and post-closure maintenance and monitoring activities.

Each waste, whether organic or inorganic, must be carefully considered when incorporating it into a CAMU or repository. The specific wood treating wastes found at MT Pole will drive the design of the cap. When designed and constructed, the CAMU will meet the federal requirements (40 CFR § 264.552) for closure and post-closure maintenance and monitoring activities protective of human health and the environment.

The engineered cap will prevent direct contact with the soil above cleanup standards and prevent leaching of the contaminants to groundwater. Cap design will be specific to wood treating wastes and will follow Code of Federal Regulations (CFR) requirements for CAMU-eligible wastes set out in 40 CFR § 264.552.

O&M (operations and maintenance) of the CAMU will be the responsibility of DEQ. DEQ will follow federal and state regulations for post-closure maintenance and monitoring activities. The CAMU will have an O&M plan specific to its construction and location. The continued protectiveness and performance of the CAMU, including O&M, will be evaluated during each five-year review. The Butte Reclamation Evaluation System (BRES) program, which is part of the Butte Priority Soils Operable Unit (BPSOU), will not extend to the CAMU due to the differences in the waste profiles and the CAMU requirements.

Specific Response to Comment A4 (Q4): The option of recreational use for the CAMU unit, after construction was considered but determined inappropriate. A solar farm (light commercial/industrial use) within the area of the CAMU is being considered, along with deed restrictions prohibiting any other active use which would be inconsistent with maintenance of the CAMU cap. Whether the CAMU area is used for a solar farm or limited to no use, access to the CAMU area will be limited to authorized personnel only and controlled by fencing.

The liner that was seen on the recent tour is part of the LTU and functions as the bottom liner to prevent leaching to the ground beneath the liner. The liner eventually became exposed around the

top edges of the LTU as treated soils were removed. If left in its current state, that liner would eventually deteriorate due to exposure to sunlight. However, in this case, the liner had reached the end of its usefulness. It will be cleaned, removed, and properly disposed of as part of the ESD cleanup.

Specific Response to Comment E3 (V.1-12): The Agencies agree that certain dioxin are dangerous “carcinogens that produce severe and serious health effects in addition to cancer.” Protecting the public from exposure to MT Pole dioxin will be achieved through careful design and construction of the CAMU. The CAMU will meet the relevant waste-specific performance standards (40 CFR § 264.552) for design, closure, and post-closure maintenance and monitoring activities.

Dioxin mobility at MT Pole is greatly reduced due to the success of the bioremediation of PCP and the PAHs as well as significant reductions in dioxin levels. Dioxin mobility is greatly reduced in the absence of these other wood-treating chemicals. To further control for and reduce the chance of dioxin mobility, the ESD is proposing to lower the PCP cleanup standard so that PCP will not leach to groundwater. Note that PAHs are already degraded to levels that will not leach to groundwater. If PCP can’t leach to groundwater, dioxin mobility will be restricted as well.

Specific Response to Comment J7: The cap design will comply with the substantive provisions of (40 CFR § 264.552(e)(6)) for closure and post-closure of CAMUs.

Specific Response to Comments P1; P2: Yes, the proposed CAMU will affect soil hydrology. The CAMU cap will decrease the current rate of infiltrating precipitation across the approximately 9-acre surface area of the CAMU. However, the reduced infiltration over the CAMU area will not impact the local shallow groundwater system. Additionally, the altered soil hydrology is not expected to impact the recovery trench located near the highway or the overall water treatment system currently at the site.

GENERAL COMMENTS SPECIFIC TO CAPPING

- **Comment S9.** “The ESD states that soil cleanup levels for dioxin were not achieved for soil treated at the Land Treatment Unit (LTU), and proposes to require soil containing dioxin to be managed onsite in a new 9-acre Corrective Action Management Unit (CAMU) that complies with applicable requirements under the Resource Conservation and Recovery Act (RCRA).”

“The ESD assumes this change will not fundamentally alter the approach, performance or cost of managing soils because the 1993 ROD called for surface grading and revegetation or covering with suitable soil. However, in addition to a clean soil cover, the CAMU is proposed to include a waterproof plastic barrier, among other things, which would unnecessarily increase costs, as such a barrier is not required to protect against human exposure to soil above cleanup levels if dioxin/furan cleanup levels were derived following EPA’s 2012 protocols discussed above (see Specific Comment #1c above).”

Comment T1. “First, we would like to make clear that given hindsight we believe that the selected remedy for the MPTP should have selected a method such as fungal bioremediation that is likely capable of significantly reducing dioxin in soil. The 1993 Record of Decision (ROD) also selected a remedy which neglected to consider the leaching to groundwater pathway for pentachlorophenol (PCP) in soils. Soils which were treated biologically on the land treatment unit (LTU) have residual PCP which can impact groundwater. However, given the current status of dioxin and PCP

contaminant levels we agree that handling the contaminated soils in a capped repository Corrective Action Management Unit (CAMU) is appropriate.”

- **Comment T4.**” In regards to the presence of residual dioxin and PCP soil contamination and need for the repository CAMU, the ESD states “these changes do not fundamentally alter the basic features of the remedy selected in the 1993 ROD.” We disagree. The 1993 ROD remedy as understood by the public is that soils would be treated such that unlimited recreational and industrial user contact would be possible and that most of the site could be redeveloped for these uses. The 1993 ROD also does not consider the perpetual risk of leaching to groundwater from residual contamination.”

“The ESD provides the following statements as evidence that the agencies anticipated that a capped repository may be necessary: “Biological land treatment is not expected to achieve the degree of treatment provided by incineration; however, it is anticipated that allowable final contaminant levels will be achieved. Design studies would be utilized to determine achievable treatment efficiencies and identify any additional remedial actions which may be necessary in conjunction with biological land treatment.” Page 9. “The ARARs identification section of the 1993 ROD did discuss additional ARARs that may be invoked should treatment not meet cleanup standards, indicating anticipation by the agencies of this circumstance.” Page 9.”

“The 1993 ROD only mentions capping for alternatives that were not selected. In fact, the ROD states for Alternative 3 which was not selected, “Capping under Alternative 3 is subject to deterioration over time and requires long term maintenance. Containment and reliance upon engineering and institutional controls to protect human health and the environment do not provide the degree of permanence that removal and treatment of contamination does.””

“The fact that the 1993 ROD includes RCRA Land Disposal Restriction ARARs in an appendix doesn’t change our opinion. The appropriate place for a ROD to identify remedy components is in the Selected Remedy and Statutory Determination sections.” In fact, the 1993 ROD Statutory Determination states “Other alternatives considered, including containment, capping and partial excavation, did not offer similar prospects for effectiveness or permanence.””

“The public expected that the chosen alternative would remediate soils and allow most of the site to be redeveloped. It does a disservice that the ESD include these statements that reflect an ‘I told you so’ attitude. We do not disagree that the plan proposed in the ESD is appropriate given what we know today about the site contaminants and efficacy of the ROD selected remedy. And we are not requesting that a ROD amendment be undertaken at this point, because we believe a ROD amendment would reach the same conclusion as the ESD. We are disagreeing that the 1993 ROD anticipated that soils would not meet cleanup levels and a repository/CAMU would be required. We believe the ESD should acknowledge this.”

RESPONSE TO GENERAL COMMENTS SPECIFIC TO CAPPING

Specific Response to Comment S9: The high-density polyethylene (HDPE) liner or “waterproof plastic barrier” is intended to prevent PCP from leaching-to-groundwater and complies with the substantive requirements of (40 CFR § 264.552(e)(6)) for closure and post-closure of CAMUs.

Specific response to Comment T1: Comment noted regarding appropriateness of a CAMU for handling residual contamination at MT Pole. As previously stated in a comment (see **Specific response to Comment K1**) specific to fungal bioremediation, DEQ conducted a detailed examination of dioxin

remediation alternatives (DEQ Memo: *More Consideration and Evaluation of Alternatives*, DEQ, April 2018) that included the status of bioremediation, specifically the use of WRF. While WRF-based remediation shows promise in the laboratory, it is still considered an emerging technology with limited field studies.

Specific response to Comment T4: DEQ and EPA appreciate your acknowledgement of remediation efforts up to this point and that “the ESD is appropriate given what we know today about the site contaminants and efficacy of the ROD selected remedy. Overall comment noted.

REMEDY – INSTITUTIONAL CONTROLS

COMMENT SUMMARY

One original comment was received regarding the Remedy of Institutional Controls, specifically relating to funding and maintenance (A7 (Q7)). Thirteen comments were not specific to the ESD and were previously submitted to and addressed by the Fourth Five-Year Review (D2 (V.1-16, V.7-2), D3 (V.1-19, V.7-3), D4 (H10, V.3-10, V.7-4), D5 (H10, V.7-5), D6 (H6, V.3-6, V.7-6), D7 (V.7-7), D8 (H7, V.3-7, V.7-8), D9 (H8, V.3-8, V.7-9), D10 (H8, V.3-8, V.7-10), D11 (H9, V.3-9, V.7-11), G4 (V.2-4), H11 (V.3-11), V.1-18, H5 (V.3-5)). Comments D2 (V.1-16, V.7-2), D3 (V.1-19, V.7-3), D4 (H10, V.3-10, V.7-4), D5 (H10, V.7-5), D6 (H6, V.3-6, V.7-6), D7 (V.7-7), D8 (H7, V.3-7, V.7-8), D9 (H8, V.3-8, V.7-9), D10 (H8, V.3-8, V.7-10), D11 (H9, V.3-9, V.7-11), G4 (V.2-4), H11 (V.3-11), V.1-18, and H5 (V.3-5) and their responses are located in Appendix B. Some comments were submitted twice, these comments are referred to as “duplicate comment” in the table below and italicized and placed within parentheses within the text. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Remedy – Institutional Controls			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
A7	Q7	X	

COMMENT SPECIFIC TO FUNDING AND MAINTENANCE

- **Comment A7 (Q7).** “The ESD proposes heavy reliance on institutional controls which have proved to be problematic at other EPA sites. Will there be enough money to maintain these institutional controls? What maintenance regime will be used?”

RESPONSE TO COMMENT SPECIFIC TO FUNDING AND MAINTENANCE

Specific response to Comment A7 (Q7): The construction outlined in the 2020 Draft ESD will require three ICs. The Butte Alluvial and Bedrock Controlled Groundwater Area (Controlled Groundwater Area), an institutional control already in place, will continue to operate to prevent domestic use of the MT Pole contaminated groundwater plume. The second will be restrictive covenants preventing residential development on the MT Pole property – some of which are already currently in place. The CAMU will remain under DEQ purview for its operation and maintenance and will include engineering controls and an IC. One of the objectives for the cleanup is for the remaining acreage on the south side of the interstate to be open to unrestricted commercial and industrial development.

REMEDY - THERMAL SOIL REMEDIATION

COMMENT SUMMARY

One comment was received regarding the Remedy of Thermal Soil Remediation (U1). For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Remedy – Thermal Soil Remediation			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
U1		X	

COMMENT SPECIFIC TO THE REMEDY OF THERMAL SOIL REMEDIATION

- **Comment U1.** “As a recognized leader in onsite, ex situ thermal treatment of soils impacted by Dioxins, NELSON respectfully requests that the use of thermal soil remediation be further considered as retained as an approved “selected remedy” for future deployment at the Montana Pole and Treating Plant Site.”

RESPONSE TO COMMENT SPECIFIC TO THE REMEDY OF THERMAL SOIL REMEDIATION

Specific response to Comment U1: The ex situ thermal treatment of soils was not retained as an alternative for the MT Pole ROD. This ESD is an update to the ROD to include a CAMU as the final action for the bioremediated soils, the selected remedy for the site.

REMEDICATION UNDER THE INTERSTATE

COMMENT SUMMARY

Two comments were received regarding Remediation Under the Interstate (A3 (Q3), V.1-5). One comment was submitted twice, this comment is referred to as “duplicate comment” in the table below and italicized and within parentheses within the text. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Remediation Under the Interstate			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
A3	<i>Q3</i>		X
V.1-5			X

COMMENTS SPECIFIC TO REMEDIATION UNDER THE INTERSTATE

- **Comment A3 (Q3).** “The contamination under the Interstate poses significant risk to the cleanup of the Pole Plant. When and how will this be addressed? The state is very unclear in terms of addressing contamination under the interstate.”
- **Comment V.1-5.** “5. MDEQ has no plan in place to address the contaminants under the interstate.”

RESPONSE TO COMMENTS SPECIFIC TO REMEDIATION UNDER THE INTERSTATE

Overall Response to Comments A3 (Q3); V.1-5: The ROD (p. 45) identifies the remediation for groundwater and contaminated soils not recovered by excavation as in-situ bioremediation. This may include reinjection of treated groundwater and the addition of oxygen and nutrients to promote the biodegradation of contaminants.

In the Third and Fourth Five-Year Reviews, the treatment of waste under the interstate (and other discrete locations) is described as Phase 5 of the cleanup. DEQ will begin planning the Phase 5 design-level data gap investigation in 2020. This investigation is the first step and will commence once this ESD off-load construction is completed. Other potential components of Phase 5 include evaluation and optimization of the water treatment plant and identification of other discrete waste (hot spots) locations suitable for in-situ bioremediation.

REUSE OF THE SITE

COMMENT SUMMARY

Six original comments were received regarding the Reuse of the Site, specifically the future use of the land (A5 (Q5), F1, F2, J8 (V.1-28), V.1-4, B1). Two comments were not specific to the 2020 Draft ESD and were previously submitted to and addressed by the 2016 Fourth Five-Year Review (G7 (V.2-2), G17 (V.2-17)). Comments G7 (V.2-2), and G17 (V.2-17) and their responses are located in Appendix B. Some comments were submitted twice, these comments are referred to as “duplicate comment” in the table below and italicized and placed within parentheses within the text. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Reuse of the Site			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
A5	<i>Q5</i>		X
B1			X
F1			X
F2			X
J9	V.1-28		X
V.1-4			X

COMMENTS SPECIFIC TO FUTURE LAND USE

- **Comment A5 (Q5).** “What will be the future land use for the site? This is still very much up in the air. You sure don't want people running around the site.”
- **Comment B1.** “I think that it is important that the CAMU Cap be undisturbed by human activity given the dioxin that will remain under it. To that end, I am both concerned and confused as to whether or not human activity features such as trails will be allowed on the cap. The potential for human interaction with dioxin in such a scenario is too great. The CAMU should be off limits to human activity and not disturbed except for necessary repairs and maintenance.”
- **Comment F1.** “I am curious what are the plans for the capped acreage? Could it be put back into beneficial use for the community? Have there been any discussions of long term use?”

- **Comment F2.** “I recently read where the Idaho pole site in Bozeman is up for delisting and redevelopment. That site looks like a grassy field and does not detract from Bozeman aesthetics. It would be nice to have the Montana Pole site look similar even if there are more restrictive use conditions.”
- **Comment J9 (V.1-28).** “8. Comprehensively address future land uses for the site.”
- **Comment V.1-4** “4. MDEQ has obfuscated regarding future land use of the site making local government planning impossible.”

RESPONSE TO COMMENTS SPECIFIC TO FUTURE LAND USE

General Response to Comments A5 (Q5); B1; F1; F2; J9 (V.1-28); V.1-4: Future use of the CAMU area will be restricted with engineering controls and ICs. The option of recreational use of the CAMU area was considered but determined inappropriate. A solar farm (light commercial/industrial use) within the area of the CAMU is being considered, along with ICs prohibiting any other active use. Whether the CAMU area is used for a solar farm or limited to no use, access to the CAMU area will be limited to authorized personnel only and controlled by fencing.

The goal of the ESD’s proposed cleanup levels would establish a more protective cleanup for PCP and dioxin. If successful, the cleanup would allow the remaining 27 acres to be available for industrial/commercial use. Achieving the proposed PCP cleanup level will also ensure the removal of dioxin contamination to below the dioxin cleanup level throughout the 27 acres earmarked for industrial/commercial use. Meeting the cleanup levels will be confirmed by post-removal sampling.

RISK ASSESSMENT

COMMENT SUMMARY

One comment was received regarding an ecological risk assessment (C2). For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Biological Treatment			
Comment ID	Duplicate Comment ID	Specific Response	Overall Response
C2		X	

COMMENT SPECIFIC TO ECOLOGICAL RISK ASSESSMENT

- **Comment C2.** “Is there a current ecological risk assessment for the Montana Pole Plant?”

RESPONSE TO COMMENT SPECIFIC TO ECOLOGICAL RISK ASSESSMENT

Specific Response to Comment L1: An ecological risk assessment (*Final Baseline Risk Assessment for the Montana Pole NPL Site*, CDM, 1993) was completed for the MT Pole site during the conduct of the remedial investigation and feasibility study. The selected remedy, as modified by this ESD, is protective of the environment as well as human health, as required by CERCLA.

ROD AMENDMENT

COMMENT SUMMARY

Two original comments were received regarding the ROD Amendment (S1, S2). For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

ROD Amendment			
Comment ID	Duplicate Comment ID	Specific Response	Overall Response
S1		X	
S2		X	

COMMENT SPECIFIC TO ROD AMMENDMENT

- **Comment S1.** 1. General Comment #1 – The Proposed Changes Cumulatively Amount to a “Fundamental” Change Warranting a ROD Amendment.

The draft ESD states that the five proposed remedy changes “are significant changes to the remedy identified in the 1993 ROD to address site-specific conditions and issues identified in the Fourth Five-Year Review (FYR) Report for the [MPTP] (April 2017), but these changes do not fundamentally alter the basic features of the remedy selected in the 1993 ROD.” ESD at 1; see also *id.* at 8, 10, 11, 13. Accordingly, DEQ has concluded that the changes can be made pursuant to an ESD, rather than a ROD Amendment, which is required for “fundamental” remedy changes. See 40 C.F.R. § 300.430(e).

Although some of the proposed changes, considered independently, could be characterized as merely “significant,” AR does not agree with DEQ’s characterization of the collective changes to the remedy as merely “significant.” Considering each change separately— in order to avoid the application of important NCP requirements to the combination of proposed changes—is inconsistent with CERCLA guidance and established practice. Specifically, CERCLA Guidance indicates that remedy modifications proposed together should be considered collectively and characterized as fundamental or significant based on their collective impact. See EPA OSWER 9200.1-23P, Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents, § 7.2 (July 1999) (ROD Guidance).

The collective impacts of the changes identified in the ESD—in terms of scope, performance, and cost—may amount to a “fundamental” change to the remedy identified in the 1993 ROD. See 40 CFR § 300.435(c)(2); ROD Guidance, § 7.2 (requiring EPA to evaluate “scope, performance, and cost” in characterizing changes to a remedy). If viewed in this manner, the combination of all of the proposed remedy modifications identified in the ESD would be characterized, evaluated, and adopted as a “fundamental” change in accordance with NCP requirements applicable to ROD amendments. This includes providing meaningful agency responses to comments on all proposed changes; evaluating all changes under the NCP criteria; and adopting any approved changes as part of a ROD Amendment.

AR’s concern is that the information provided by the agencies in support of the ESD is not sufficient to fully analyze the remedy changes proposed and consider whether such changes collectively should be characterized as a “fundamental” change in remedy scope, performance and/or cost. The missing information is described further in AR’s General Comment #3 and #2 and the Specific Comments below.

- **Comment S2:** “The draft ESD states that “[a] separate ESD or ROD Amendment is anticipated to address other items identified in the Fourth FYR Report that pertain to groundwater and surface water.” ESD at 7. Based on the information provided in the Fourth FYR Report and the ESD, the reader cannot determine what “other items” need to be addressed. Based on the information available at this time, AR does not agree that there is a basis to further amend the MPTP remedy identified in the 1993 ROD. Moreover, if DEQ is planning to issue one or more additional ROD amendments and/or another ESD, such changes should be presented and analyzed in conjunction with the remedy changes described in this proposed ESD. AR reserves the right to comment on and/or object to any separate future ESDs or ROD amendments intended to further modify the MPTP remedy selected in the 1993 ROD, including objections to proposed changes that are not necessary to protect human health and the environment, or are otherwise inconsistent with the NCP.”

RESPONSE TO COMMENT SPECIFIC TO ROD AMMENDMENT

Specific Response to Comment S1: Table 2 of the 2020 Draft ESD outlines the Significant Differences proposed by the ESD along with the description of the changes and impact on remedy scope, performance, and cost demonstrating a detailed side-by-side analysis as recommended in Section 7.3.2 in the guidance. The comment does not identify specific issues with the rationale in the table, or specify what AR considers the overall cumulative impact to be nor how that represents a fundamental change. DEQ and EPA consider the changes reflected in this ESD to be significant but not fundamental as described in the referenced table and further as follows:

The 2020 Draft ESD does not identify any new contaminants of concern, it only updates the action levels for existing COCs based on updated State risk-based criteria.

The estimated costs of all significant differences required under the ESD are estimated to cost an additional \$1.3M (*Preliminary Cost Estimates for Proposed Changes to the Montana Pole and Treating Plant Selected Remedy*, Tetra Tech, November 2020), which compared to the \$34M spent by the agencies on the remedy to date since the ROD (which does not include water treatment plant construction costs) is less than 4%.

The anticipated land reuse from the ROD was recreational, and potentially industrial if cleanup levels were achieved. Since the dioxin cleanup level was not achieved, the remedy has been significantly modified to address this issue. The actions that will take place based on the ESD will make the remedy more protective for both industrial and recreational reuse. This is not a fundamental change to the site remedy.

The remedy presented in the ROD included extraction and treatment of impacted groundwater. Based on additional information gathered during operation of the site and investigations which identify the leaching potential of PCP in site soils to groundwater, the further protection of groundwater by impacted soil consolidation in a CAMU with an engineered cover is consistent with the overall remedy for the site.

Specific Response to Comment S2: DEQ appreciates the candid feedback. We continue to value community involvement moving forward with the ESD and future activities at MT Pole. Overall comment noted.

STORMWATER AND EROSION

COMMENT SUMMARY

Three original comments were received regarding Stormwater and Erosion (A6 (Q6), J8 (V.1-27), V.1-7). Two comments are not specific to the 2020 Draft ESD and were previously submitted to and addressed by the Fourth Five-Year Review (G5 (V.2-5), G11 (V.2-11)). Comments G5 (V.2-5) and G11 (V.2-11) and their responses are located in Appendix B. Some comments were submitted twice, these comments are referred to as “duplicate comment” in the table below and italicized and within parentheses within the text. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Stormwater and Erosion			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
A6	Q6	X	X
J8	<i>V.1-27</i>		X
V.1-7			X

COMMENTS SPECIFIC TO STORMWATER AND EROSION

- **Comment A6 (Q6).** “Are the proposed stormwater controls sufficient to protect the cap from erosion?”
- **Comment J8 (V.1-27).** “7. Prove that the stormwater control protocols for the site will be efficacious.”
- **Comment V.1-7.** “7 Stormwater runoff controls through the site appear to be problematic.”

RESPONSE TO COMMENTS SPECIFIC TO STORMWATER AND EROSION

Overall Response to Comments A6 (Q6); J8 (V.1-27); V.1-7: The MT Pole storm water is managed under two methods. Storm water or rain landing on MT Pole property is contained on site and allowed to infiltrate into the soil. If contamination moves with it and reaches the groundwater, it will be treated at the water treatment plant. Storm water coming from off site (from the south and east of the property) is routed through the MT Pole property, via storm ditches that do not contain wood treating waste contaminants and exits the property to the north. The storm water eventually ends up in Silver Bow Creek and will be addressed as part of the recently amended BPSOU ROD. The results of the *Soil and Surface Water Data Gap Investigation* (Tetra Tech, November 2017) confirm that management of storm water run-on and run-off is effective and protective of Silver Bow Creek.

In the ESD construction, storm water best management practices will be designed and used specific to construction activities and upgrades will be made for storm water originating offsite. The storm water will be directed into a ditch constructed during the final offload. The ditch will be designed to convey storm water through the MT Pole site to Silver Bow Creek without encountering contaminants or commingling with storm water originating onsite.

Specific Response to Comment A6 (Q6): The CAMU will meet the relevant, substantive waste-specific performance standards (40 CFR § 264.552) for design, closure, and post-closure maintenance and monitoring activities. Storm water management will be incorporated into the design, operation, and maintenance of the CAMU. Access controls, such as fencing, to protect the cap will be in place

until vegetation or other erosion-preventing features are established. Storm water originating offsite will be managed to ensure no contact with contaminant sources.

TREE MORTALITY

COMMENT SUMMARY

One comment was received regarding Tree Mortality (C1). For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Biological Treatment			
Comment ID	Duplicate Comment ID	Specific Response	Overall Response
C1		X	

COMMENT SPECIFIC TO TREE MORTALITY

- **Comment C1.** “Trees were planted along the road sometime back as I recall to provide a wind break to help control dust. Those trees died unexpectedly. Initially, they were thought to have died from exposure to the toxics of concern at the Pole Plant. Then, we were told that the cause was the dropping of herbicide by an area weed control firm. Last evening, discussion with several residents indicated that the herbicide explanation was not viable particularly in terms of both sides of the road. So, what really happened? What caused the death of the trees? This is not simply an arcane topic of interest but should be addressed: What caused the death of hundreds of trees? If it was contact with the toxic waste at the Pole Plant that is important to know as we assess the ESD.”

RESPONSE TO COMMENT SPECIFIC TO TREE MORTALITY

Specific Response to Comment C1: Soil samples were collected in September 2011 to assess the cause of the tree mortality at the land treatment unit. PCP was used as an indicator contaminant. Seven of the 10 soil samples analyzed reported PCP concentrations to be less than detection limits. The three other samples reported PCP concentrations of 0.27 to 0.29 milligrams per kilogram (mg/kg); which are 3 orders of magnitude below the ROD cleanup standard of 34 mg/kg. Based on the laboratory results, the tree mortality was not caused by MT Pole site contamination:

- The analytical PCP data for the 10 soil samples collected in the vicinity of the trees was either non-detect or significantly below the PCP soil cleanup level
- Lack of visible contamination or soil staining at the time the trees were planted, and
- Thriving revegetation on the north side of the Site (over offloaded soils from the land treatment unit).

Note: Photos of the herbicide tanks being emptied on Greenwood Boulevard were provided to the residents who expressed the concern.

WATER TREATMENT PLANT

COMMENT SUMMARY

One comment was received regarding the Water Treatment Plant (R1). For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Water Treatment Plant			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
R1		X	

COMMENT SPECIFIC TO THE WATER TREATMENT PLANT

- **Comment R1.** Viewing out the window of my house here in Williamsburg I see new power poles about 50 feet high, along side the existing water treatment plant wondering, if that's part of the program. Greenwood Avenue could use some attention.

RESPONSE TO COMMENT SPECIFIC TO THE WATER TREATMENT PLANT

Specific Response to Comment R1: The new power poles are part of a transmission line relocation project conducted by NorthWestern Energy and are not associated with any MT Pole remedial actions.

WATER QUALITY

COMMENT SUMMARY

Eight comments were received regarding Water Quality. Two of the comments addressed the Water Treatment Plant (A2 (Q2), V.1-3), four of the comments are in regards to Silver Bow Creek (E1 (V.1-10), G9 (K8, V.2-9), K2), one of the comments is concerning the ROD (E1 (V.1-10)), and two comments address groundwater contamination (T2, T7). Some comments were submitted twice, these comments are referred to as "duplicate comment" in the table below and italicized and placed within parentheses within the text. For comment responses, similar comments are grouped together and addressed by one overall response with specific responses to comments as needed.

Water Treatment Plant			
Comment ID	<i>Duplicate Comment ID</i>	Specific Response	Overall Response
A2	<i>Q2</i>		X
E1	V.1-10	X	
K2		X	
T2		X	
T7		X	
V.1-3			X

COMMENTS SPECIFIC TO WATER QUALITY

- **Comment A2 (Q2).** "At the present time the water treatment plant is not producing water that can meet all of the water quality standards. What assurances does the public have this this will be remedied and the water treatment plant will produce water that is in compliance with water quality standards? MDEQ says that we are "close." But I don't know what that means. How close? When will standards be achieved? Will they be achieved or are we looking down the road at

another waiver of standards in Butte? If they haven't been able to meet standards in the past, why should we think that they will meet standards in the future?"

- **Comment K2.** "Also, what has become of the dioxin that is and has been discharged from Montana Pole Plant into Silver Bow Creek? Does it present a threat to human health and the environment? Is it still present in the Creek? Will it be remediated? Has it been measured? What will be done about it?"
- **Comment E1 (V.1-10).** 1. "Current dioxin discharge from the Montana Pole Plant into Silver Bow Creek does not meet water quality standards. 2. The water quality standards set by the ROD for Montana Pole Plant are very permissive and less restrictive/protective than national standards. So meeting these lax standards does not protect human health and the environment. But even these lax standards are not being met. 3. The current ground water treatment system in place at Montana Pole Plant discharges dioxin into Silver Bow Creek at 100 times the lax water quality standards. 4. This current discharge at 100 times the permissive water quality standards will continue for decades."
- **Comment T2.** "We have some concerns that DEQ anticipates that the repository CAMU will not require a liner and leachate collection system. The ESD suggests that the aquifer in the area is institutionally controlled by a controlled groundwater area (CGWA) and impacts to groundwater from the repository are therefore less of a concern. The CGWA does not change the fact that the repository must not be a perpetual source of contaminants to the aquifer. The ROD goals for groundwater are to attain cleanup levels at groundwater points of compliance. Eventually the groundwater pump and treat system will be shut down. At that time it will be critical that the repository not be an ongoing source of PCP contamination. Additionally, it is the community's desire that perpetual sources of contamination be removed or remediated to the extent practical."
- **Comment T7.** "The ESD states that groundwater points of compliances will be addressed in a future ESD pertaining to groundwater and surface water and soil beneath the treatment building and beneath the interstate highway will be addressed in a future ESD or ROD Amendment. CTEC would like further information in the near future on these proposed changes to the remedy."
- **Comment V.1-3.** "3. The water treatment plant is not meeting water quality standards."

RESPONSE TO COMMENTS SPECIFIC TO WATER QUALITY

Overall Response to Comments A2 (Q2); V.1-3: Water treatment plant discharge and surface water have consistently met ROD cleanup levels since 2001. The water treatment plant discharge meets the ROD PCP cleanup level 97% (970 samples out of 1000 samples taken) of the time since 2001. The water treatment plant discharge has met the ROD dioxin cleanup level 100% of the time. All surface water PCP samples since 2007 meet the ROD PCP standard for surface water. All surface water dioxin samples since testing began in 2006 also meet the ROD dioxin standard for surface water. The groundwater plume associated with MT Pole contamination continues to shrink through application of the ROD remedy of pump and treat through the water treatment plant (*2019 Annual Report*, Tetra Tech, November 2020). Also, as acknowledged in the ESD, "A separate ESD or ROD Amendment is anticipated to address other items identified in the Fourth Five-Year Review Report that pertain to groundwater and surface water."

Specific Response to Comment E1:

- Response to E1.1. The water treatment plant discharge has met the ROD dioxin cleanup level 100% of the time. The Fourth Five-Year Review indicates that “the dioxin effluent concentration in the last five years has been below 1 picograms per liter (pg/L), well below the Record of Decision discharge limit of 10 pg/L.” The ROD discharge limit is higher than the current DEQ-7 standard in surface water of 0.005 pg/L. Water treatment plant discharge standards will be evaluated once the forthcoming groundwater design data gap investigation is completed. The groundwater, surface water, and discharge updates and/or proposed changes to the ROD will be found in a subsequent decision document.
- Response to E1.2. See *Overall Response to Comments A2 (Q2); V.1-3*.
- Response to E1.3. The groundwater treatment system is the water treatment plant. See *Response to E1.1* above.
- Response to E1.4. The groundwater treatment system is the water treatment plant. See *Response to E1.1* above.

Specific Response to Comments K2: The MCL for dioxin at the time of the ROD was 30 pg/L. The MCL comes from the National Primary Drinking Water Regulations (NPDWR). They are legally enforceable primary standards and treatment techniques that apply to public water systems. Primary standards and treatment techniques protect public health by limiting the levels of contaminants in drinking water (*EPA 16-F-09-004*, EPA, May 2009). The EPA dioxin MCL is still 30 pg/L. The ROD cleanup level for dioxin is 10 pg/L, 20 pg/L less than EPA’s dioxin MCL.

The water treatment plant effluent (discharge) has never exceeded the ROD discharge limit of 10 pg/L. In fact, the effluent has never exceeded 5 pg/L since monitoring for dioxin began.

DEQ’s present Surface Water Standard (human health) for dioxin is 0.05 pg/L. Similar to the soils cleanup standards evaluation in this ESD, the groundwater, surface water, and discharge standards will be evaluated during Phase 5 of the ROD implementation.

Overall, measuring historical dioxin contamination in Silver Bow Creek is outside the scope of the ROD and more specifically, outside of the scope of the 2020 Draft ESD. In addition, other dioxin sources would need to be identified and considered. Silver Bow Creek dioxin concentrations upstream and downstream of the reach directly north of MT Pole are consistently similar in concentrations (< 2 pg/L), meaning that there may be upstream sources of dioxin. One exception to similar concentrations was identified in June 2017 when the upstream dioxin concentration (12 pg/L) was larger than the downstream concentration (6.7 pg/L). This sampling event took place during a large storm event and the surface water was muddied by sediment associated with the upstream runoff.

Specific Response to Comment T2: DEQ agrees it is “critical that the repository (CAMU) not be an ongoing source of PCP contamination.” Therefore, DEQ’s hydrogeologist and Tetra Tech’s hydrogeologist worked together to assess the need for a bottom liner and leachate collection system and based on that assessment, outlined below, DEQ determined that the CAMU will be protective to groundwater without a bottom liner and leachate collection system.

The need for a bottom liner and leachate collection system was evaluated with two approaches. First, a Hydrologic Evaluation of Landfill Performance (HELP) model compared leaching from the CAMU under multiple scenarios, including with and without a bottom liner. Second, a Vadose Zone Transport Model was developed following guidance from US EPA *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites OSWER 9355.4-24* (EPA, 2002).

The HELP model simulated leaching from the CAMU under three scenarios. The first scenario included the cover soil, drainage net, and top HDPE liner to simulate leaching below the top liner into the contaminated soil. The second scenario included the cover soil, drainage net, top HDPE liner, and an estimated 9.5 feet of contaminated soil fill within the CAMU to simulate leaching from the bottom of the CAMU with no bottom liner. The third scenario included the cover soil, drainage net, top HDPE liner, estimated 9.5 feet of contaminated soil fill within the CAMU, bottom drainage net (for leachate collection) and bottom HDPE liner to simulate leaching from the bottom of the CAMU with a bottom liner. Results from the simulation with a 50-year time steps indicates no significant increase in protection of groundwater with a bottom liner (Table 1). Based on comparing the estimated leakage from Layer 4 in the "HDPE Lined With Contaminated Soil Layer" model run (Table 1 yellow cells) with leakage from Layer 6 in the "HDPE Liner with Waste Layer & Bottom Liner Bottom Liner" model run (Table 1 orange cells), addition of a bottom liner would reduce leakage from the CAMU by an additional 6 percent. Since the input precipitation value is only accurate to 0.1 inch, there is no statistically significant difference between the bottom liner and non-bottom liner simulation results. Additionally, for all three scenarios the model was set to assume no surface runoff, which forces the HELP model to have all precipitation infiltrate into the CAMU. However, the CAMU will include a stormwater retention system to capture potential surface flow during snow melt or intense precipitation, therefore the stormwater would not pond on top of the CAMU, further reducing potential leaching rates.




Table 1: HELP Model Results

	Original HDPE Liner Model		HDPE Liner with Contaminated Soil Layer*		HDPE Liner with Waste Layer & Bottom Liner**	
	50-yr Average (inches/ yr)	Standard Deviation	50-yr Average (inches/ yr)	Standard Deviation	50-yr Average (inches/ yr)	Standard Deviation
Precipitation	12.7	1.715	12.7	1.715	12.7	1.715
Runoff	0	0	0	0	0	0
Evapotranspiration	11.259	1.5489	11.259	1.5489	11.259	1.5489
Lateral Drainage Collected from Layer 2 (Drain Net)	0.58847	0.51447	1.43159	0.80424	1.43159	0.80424
Percolation/ Leakage Through Layer 3 (HDPE Liner)	0.84916	0.30575	0.00603	0.00510	0.00603	0.00510
Percolation/ Leakage Through Layer 4 (Contaminated Soil)	NA	NA	0.00532	0.00177	NA	NA
Lateral Drainage Collected from Layer 5 (Drain Net)	NA	NA	NA	NA	0.00021	0.00011
Percolation/ Leakage Through Layer 6 (Bottom HDPE Liner)	NA	NA	NA	NA	0.00501	0.00169

Notes:

*Contaminated Soil Layer estimated at 9.5 feet from CAMU 30% design

**Bottom Liner assumed same HDPE liner and drainage net as top liner

-  Assumes leakage with free drainage below Layer 3
-  Assumes leakage with free drainage below Layer 4
-  Assumes leakage with free drainage below Layer 6

The Vadose Zone Transport Model was designed to simulate vadose travel velocity and estimated travel time for PCP at the site. PCP is an organochlorine compound which can form strong bonds to soil organic matter and clay minerals. The bonding of PCP to soil is measured as a soil-water

partition coefficient (Kd) value where higher values indicate stronger bonding to soil and less likely to be mobilized into groundwater. During the *Soil and Surface Water Data Gap Investigation Report* (DEQ, November 2017), 17 samples were collected for synthetic precipitation leaching procedure (SPLP) with Kd values calculated following the New Jersey Method. Kd values ranged from a high of 338.3 L/kg to a low of 0.0001 L/kg (New Jersey Method default value). For the Vadose Zone Travel Time Model, four Kd values were selected to develop a range of expected vadose zone travel times (Table 2).

Table 2: Vadose Travel time Model Kd Values and Travel Time

Kd Value (L/kg)	Comments	Travel Time (years per vertical foot)
0.0001	Most Conservative Kd	4
1.0	Lower Confidence Level Kd (Tetra Tech 2017)	30
2.96	Site Calculated Generic Kd (EPA 2002)	82
69.2	Mean Kd (Tetra Tech 2017)	1,818

Precipitation which infiltrates past the top HDPE liner would travel through an estimated ten feet of contaminated soil and an additional ten to twenty feet of soil/ sediment prior to reaching groundwater. The infiltration rate from the HELP model scenario “Original HDPE Liner Model” was used in the vadose zone travel time calculations. Since this infiltration rate assumes leakage through the top HDPE liner with free draining below the liner represents the more conservative estimate of infiltration. Total travel times from below the HDPE liner to the static water level are estimated in Table 3.

Table 3: Vadose Travel Time Estimates

Kd Value (L/kg)	High Static Water Level (travel time in years)	Low Static Water Level (travel time in years)
0.0001	85	127
1.0	305	609
2.96	1,637	2,455
69.2	36,365	54,548

Even under the most conservative Kd estimate (0.0001 L/kg), the expected travel time would be 85 to 127 years for PCP to travel from below the HDPE liner to the water table. The modeled travel time assumes no natural attenuation through the biological breakdown of PCP occurs during transport.

Specific Response to Comment T7: The groundwater points of compliance, and contaminated soil beneath the water treatment building, interstate, and other discrete areas will be addressed in Phase 5 (see Third and Fourth Five-Year Reviews) of the ROD implementation. DEQ will begin planning the Phase 5 design-level data gap investigation in 2020. This investigation is the first step and will commence once this ESD off-load construction is completed. Other potential components of Phase 5 include evaluation and optimization of the water treatment plant, identification of other discrete waste (hot spots) locations suitable for in-situ bioremediation. DEQ will provide Phase 5 updates to CTEC as information becomes available.

APPENDIX A

EMAIL A

From: [REDACTED] <[REDACTED]@yahoo.com>

Sent: Tuesday, February 18, 2020 5:34 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Public Comment--Montana Pole Plant

Under the auspices of the thirty day comment period for Montana Pole Plant, I would like to submit as input these initial concerns and comments. Before the end of the comment period, I will submit much more extensive comments.

[REDACTED]

Issues that need to be addressed at Montana Pole Plant

Submitted by: [REDACTED]

Initially, I would like for MDEQ and EPA to address the following issues and concerns regarding Montana Pole Plant

1. In the October 29, 2017 edition of the Montana Standard in a report entitled "Taking Heat Now over Montana Pole Cleanup" we find the following.

- a. MDEQ estimates that it will take 50 years to remove all the petroleum based pollutants out of the groundwater.
- b. There is money to operate the water treatment plant at the Pole Plant for only 30 years, given that the Pole Plant is a cash out site.
- c. So where will MDEQ get the money to operate the water treatment plant for the additional 20 years that it will need to operate to remove all the petroleum based pollutants out of the groundwater?

2. At the present time the water treatment plant is not producing water that can meet all of the water quality standards. What assurances does the public have this this will be remedied and the water treatment plant will produce water that is in compliance with water quality standards? MDEQ says that we are "close." But I don't know what that means. How close? When will standards be achieved? Will they be achieved or are we looking down the road at another waiver of standards in Butte? If they haven't been able to meet standards in the past, why should we think that they will meet standards in the future?

3. The contamination under the Interstate poses significant risk to the cleanup of the Pole Plant. When and how will this be addressed? The state is very unclear in terms of addressing contamination under the interstate.

4. Dioxin is very dangerous. There are really no safe levels of exposure. MDEQ proposes to leave the dioxin on site, unremediated, with a cap. Caps in Butte have a very problematic history and we must remember that the contamination in the rest of Butte outside of the Pole Plant is nowhere near as toxic as the threat from dioxin. The proposal is to allow recreational use over the dioxin cap. Is that wise? Is that protective? How permanent is the proposed lining? On a recent tour I saw some of the present lining exposed to sunlight that degrades the cap. There are also unanswered issues regarding the long term maintenance of the cap. Is there enough money to maintain the cap?

5. What will be the future land use for the site? This is still very much up in the air. You sure don't want people running around the site.

6. Are the proposed stormwater controls sufficient to protect the cap from erosion?
7. The ESD proposes heavy reliance on institutional controls which have proved to be problematic at other EPA sites. Will there be enough money to maintain these institutional controls? What maintenance regime will be used?
8. This is a cash out site with very limited money for cleanup and no practical source for more. Is there enough money in the "pot" to adequately clean up and maintain the site? Earlier I raised the issue of insufficient funds to operate the water treatment plant for as long as it is needed.
9. In the past MDEQ has not done a good job in keeping the public and particularly the nearby residents informed as to what is going on. Will that improve? How will that improve?
10. Given the remediation protocol outlined in the ESD, odors emanating from the Pole Plant could again become an issue. What will MDEQ do to mitigate the effects of odors emanating from the Pole Plant?
11. MDEQ has had a "spotty" record in meeting the requirements of the ROD for the site and water quality standards. What assurances can be given to the public that going forward the pole Plant will be in compliance?

EMAIL B

From: [REDACTED] <[REDACTED]@yahoo.com>

Sent: Wednesday, February 19, 2020 5:39 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Input Montana Pole Comment Period

I think that it is important that the CAMU Cap be undisturbed by human activity given the dioxin that will remain under it.

To that end, I am both concerned and confused as to whether or not human activity features such as trails will be allowed on the cap.

The potential for human interaction with dioxin in such a scenario is too great. The CAMU should be of flimits to human activity and not distrubed except for necessary repairs and maintenance. Please address this issue.

[REDACTED]

EMAIL C

From: [REDACTED] <[REDACTED]@yahoo.com>
Sent: Wednesday, February 19, 2020 8:05 AM
To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>
Cc: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@yahoo.com>
Subject: [EXTERNAL] Additional Input Public Comment Period Montana Pole Plant

Additional Input--Montana Pole Public Comment Period.

Last evening at the Butte Brewing Company Pole Plant Open House the issue of dead trees once again surfaced.

Trees were planted along the road sometime back as I recall to provide a wind break to help control dust. Those trees died unexpectedly.

Initially, they were thought to have died from exposure to the toxics of concern at the Pole Plant. Then, we were told that the cause was the dropping of herbicide by an area weed control firm. Last evening, discussion with several residents indicated that the herbicide explanation was not viable particularly in terms of both sides of the road.

So, what really happened? What caused the death of the trees?

This is not simply an arcane topic of interest but should be addressed: What caused the death of hundreds of trees?

If it was contact with the toxic waste at the Pole Plant that is important to know as we assess the ESD. **Also, is there a current ecological risk assessment for the Montana Pole Plant?**

These above issues must be addressed.

[REDACTED]

EMAIL D

From: [REDACTED] <[REDACTED]@yahoo.com>

Sent: Monday, February 24, 2020 6:22 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Comments ESD Montana Pole Plant

Reliance on Caps and Institutional Controls is Inadequate to Protect Human Health at the Montana Pole Plant

[REDACTED]
Butte, Montana

The ESD for Montana Pole Plant utilizes Caps and Institutional Controls as major elements of the remedy for Montana Pole Plant. The following address significant issues that I would like addressed in the responsiveness summary for Montana Pole Plant.

Caps are not Permanently Protective of Human Health and the Environment.

Problems with caps:

1. Toxics can be remobilized through bio-irrigation. (Dueri, Sibylle, et. al., University of Laval, Quebec, "Modeling the Transport of Heavy Metals through a Capping-Layer: The case Study of the Flood Sediments Deposited in the Saguenay Fjord, Quebec.")
2. The long term efficacy of caps can be compromised by advection "related to consolidation, diffusion, chemical reactions, and the effect of . . . burrowing activity." (*Ibid.*)
3. Desiccation can cause cracking of the cap cover. (David Daniel, Professor of Civil Engineering, University of Texas, *Geotechnical Practice for Waste Disposal*)
4. The freeze-thaw cycle can produce changes in the structure and fabric of the cover and a way that increases hydraulic conductivity. (*Ibid.*)
5. Caps are difficult to construct correctly. (*Ibid.*)
6. Caps are difficult to maintain and repair. (*Ibid.*)
7. Erosion is a serious problem. (Jack Caldwell, U.S. Department of Energy, *Principles and Practice of Waste Encapsulation.*)
8. Biointrusion can compromise the effectiveness of the cap. (*Ibid.*)
9. Differential settlement of the cap can cause cracking. (Oweis and Khera, New Jersey Institute of Technology, *Geotechnology of Waste Management.*)
10. Caps require regular and often expensive repair. (*Ibid.*)
11. Stabilization of the cap is a problem. (*Ibid.*)
12. Caps present long-term subsidence and settlement issues. (*Ibid.*)
13. Because of their susceptibility to "weathering, cracking and subsidence" caps have limited long term utility. "Wind, rain, and generalized erosion over time can severely damage even a well-designed . . . cover." (U.S. Department of Energy, Office of Environmental Management, "Remediation Technology Descriptions: Containment.") See also: Merritt, Frederick (ed.) *Standard Handbook for Civil Engineers*, McGraw-Hill, New York.

The extensive use of caps as a cleanup method for Montana Pole Plant would do nothing to reduce the toxicity and volume and mobility of contaminants. Caps do nothing to clean up a site. The extensive use of caps as a cleanup method for Montana Pole Plant would not provide a permanent

remedy. The extensive use of caps as a cleanup method for Montana Pole Plant would violate the Superfund mandate for treatment over containment. In short, the extensive use of caps for the Montana Pole Plant would not be protective of human health and the environment.

Institutional Controls—The Public should be concerned about too great a Reliance on Institutional Controls for the ESD as currently being proposed for Montana Pole Plant.

Institutional controls per se do nothing to reduce the mobility, toxicity, or volume of contaminants. Institutional controls do nothing to clean up a site. The institutional controls being considered for Montana Pole Plant would seriously limit productive land uses and greatly compromise the property rights of owners to use their land as they determine. The extensive reliance on institutional controls is also contrary to the Superfund mandate of preference for treatment over restricted land use. Institutional controls do nothing to treat a site. The EPA's own document "Rules of Thumb for Superfund Remedy Selection" states that the law mandates a clear preference for treatment over all other approaches. "EPA expects to use treatment to address the principal threats posed by a site. . . ." [40 CFR 300.430(a)(1)(iii)(A)]. The above document also notes: "Institutional controls. . . generally shall not substitute for more active measures. . . ." (pp. 12-13)

The EPA itself has found significant problems with institutional controls at its other sites. In an article entitled "EPA, Think Tank Studies Show Superfund Land-use Controls Flawed, December 10, 2001" which summarizes "Superfund Report via Inside EPA.com" by Resources for the Future, we find these conclusions, *reached by the EPA itself*, which due to their significance, I will quote at length:

"EPA and environmental think tank studies have shown that the federal and state governments' land-use restrictions at Superfund sites, known as institutional controls (IC), are seriously flawed, with an agency study showing the controls are not reliably implemented and the think tank report finding the controls are dramatically under-funded."

"During a November 27 land use control summit, sponsored by the International City/County Management Association (ICMA), EPA officials and the Environmental Law Institute (ELI), outlined numerous shortcomings they have found with EPA's IC monitoring and enforcement efforts nationwide. While EPA released the results of a study showing EPA has failed to ensure Superfund ICs are reliably implemented, and ELI study indicates that EPA's ICs are dramatically under-funded."

"Bruce Means, of EPA's Federal Facilities Restoration and Reuse Office, told attendees that preliminary studies show that half of the ICs implemented under Superfund records of decisions (ROD) were mischaracterized. During a study of RODs conducted during 1999 and 2000, the agency found that half of the ICs established under RODs were not implemented as the agency had planned."

"And Jay Pendergrass of ELI outlined the preliminary findings of ELI's study of state's IC programs, which showed that the programs are severely under-funded."

"In a draft version of the report, Pendergrass found that state environmental programs are underfunded and as a result the sites allocate very little time on IC implementation. The funding and staffing shortfall 'raises concerns about whether [ICs] are implemented as intended and [are] as protective as intended."

"An ICMA source agrees that EPA has serious problems with its IC program, saying that the agency has many RODs with vague or inconsistent references to such controls."

(pages 1-2)

The greater the cleanup of the Montana Pole Plant the more the site can be used productively. The less cleanup of the Montana Pole Plant, the less the site can be used for residences and recreational uses. Given the EPA's admission that institutional controls have failed in the past, it is amazing that the remedies listed in the ESD for Montana Pole Plant call for such extensive use of institutional controls.

Other Problems with Institutional Controls:

- a. There is a tendency not to implement institutional controls as time passes. Frequently institutional control mandates are not carried to completion.
- b. The effectiveness of institutional controls usually depends upon the ability, personnel and resources of the local government to implement. Often local governments do not have the personnel or resources to devote to the implementation and monitoring of institutional controls. Given the national administration's proposed cutbacks in Superfund allocations, resources will be increasingly unavailable on the national level to monitor implementation and effectiveness of institutional controls. Certainly the financial capacity of Butte's local government to implement and monitor institutional controls is greatly limited. Nowhere does the EPA's comprehensively address the above issue.
- c. "Institutional controls rely heavily on humans to implement, oversee, and administer them. It is human nature to ignore tasks that no one else seems to care about or where the purpose is not readily apparent. Residual hazardous substances are a classic example of a problem that is not readily apparent." ("Protecting Public Health at Superfund Sites: Can Institutional Controls Meet the Challenge?" Environmental Law Institute, p. 2)
- d. Although EPA must review the remedy every five years, the frequency of this review process may be insufficient to detect the failure of institutional controls.
- e. The use of education as part of the institutional controls strategy is a substantial part of the EPA's approach to implementing institutional controls. Research of previous remedies under Superfund indicates that education programs fail to materialize.
- f. "In addition to the direct costs of implementing institutional controls, their use can impose substantial indirect costs on communities, property owners, prospective purchasers and developers by limiting the ways a site may be used. The burden of the restrictions on use of the site falls on the property owner and the community, with the owner reaping potentially lower profits from use of the property and the community receiving lower social benefits from the allowed uses than would have been possible if no restrictions existed." (ELI, *Ibid.*)
- g. Because the sites where institutional controls will be implemented will not be cleaned up and will present a continuing potential threat to human health, these sites will be off limits to development in perpetuity. It is difficult to see how the use of institutional controls meshes with the goals of the EPA's Superfund Redevelopment Initiative.
- h. It is impossible to determine future possible land uses for the site nor is it possible to predict unanticipated land uses. (See: "Linking Land Use and Superfund Cleanups: Uncharted Territory," by Probst, Hersh, Wernstedt and Mazurek, *Summary of Findings*, RFF, p. 1)
- i. "Institutional controls have more problems than just risk miscalculation. Breaches in the site because of future construction, or even animals may cause the control to fail. The lack of a required contingency plan, would not account for new remedies, new information, or failed institutional controls negatively impacts the effectiveness of the treatment. Institutional memory loss was well is an important factor. This memory loss occurs when a party decides to breach the original institutional control without its own knowledge. In fact, in the ICMA (International City/County Management Association) study, the majority of respondents (63%) said that breaches in the institutional controls on a site were highly or somewhat likely. Following up on that question, 30% of the respondents reported that no formal inspection schedule was set up to evaluate the site as require by law." (Erwin Tam, Environmental Science and Economics, UC Berkeley, "Analysis of Institutional Controls at California Superfund Sites.")

- j. “Concern has been expressed about the long-term viability of institutional controls as a remediation tool. For example, they may be forgotten; enforcement agencies may not effectively review properties or land users’ actions; or land users simply may take their chances. Decision makers should weigh the full costs of such options, including capital costs, costs of long-term sampling and analysis, and costs of replacing equipment, as well as concerns about potential long-term risks associated with contaminants left in place, against the cost options that would remove the contaminants completely. Many local governments do not yet have the capacity and resources necessary to meet the challenges of long-term stewardship.” (“Understanding the Role of Institutional Controls at Brownfields Sites: Major Concepts and Issues.”)
- k. Because institutional controls leave large amounts of contaminants in place, institutional controls will have to be perpetual. Who is to say what anticipated land uses come up for an institutionally controlled area? For example, fifty years after the record of decision for Montana Pole Plant is implemented, the contaminants will still be there threatening human health and the environment, but will the will be there to restrict land uses in order to prevent the release of contaminants. “Institutional controls ‘work’ only if they are complied with. And while this is true of any site remedy, institutional controls require monitoring and enforcement over long time periods.” (“Linking Land Use and Superfund Cleanups: Unchartered Territory, Probst, et al., Resources for the Future Center for Risk Management.) Will the will to enforce institutional controls exist fifty to a hundred years in the future?
- l. Legal, social and political pressures limit the effectiveness of institutional controls. (*Ibid.*)
- m. The long-term effectiveness of institutional controls is unknown. “There has, however, been little investigation of what happens at sites on the National Priorities List (NPL) when land use plays a prominent role in the remedy selection process. There also has been little analysis of what institutions are involved in making land use decisions and maintaining land use restrictions over time. It is unclear what legal mechanisms are most effective, what institutions will be responsible for enforcing institutional controls, and who’s going to pay for these additional responsibilities. We need to be able to answer these questions if land use-based remedies are to be protective over the long term.” (*Ibid.*)

“Planners of long-term disposal systems have long recognized the difficulty of maintaining institutional control over property. . . .” (Jack A. Caldwell and Charles C. Reith, *Principles and Practice of Waste Encapsulation*, 1993, p. 35)

More on the inadequacy of Institutional Controls

Superfund’s goal is to clean up hazardous waste sites that pose a threat to human health and the environment. Superfund cleanups should provide a permanent remedy that, in part, reduces the toxicity, mobility, and volume of contaminants. Because Superfund has a strong preference for treatment, the use of institutional controls should normally not be a substitute for “more active measures (e.g. treatment and/or containment of source materials) as the sole remedy. . . .” (40 CFR 300.430(a)(1)(iii)(D). OSWER Directive 9355.0-69, EPA 540-R-97-013 makes essentially this same point that the use of institutional controls should be a remedy of last resort.

To the extent that contamination at a site is really cleaned up, the necessity for institutional controls is minimized. To the extent that institutional controls are used at a site to put waste off-limits, the extent of contamination cleanup is minimized. It is important to remember that the impetus for Superfund in the first place was a failure of institutional controls to prevent the contamination problems and resultant health effects at Love Canal where the institutional controls were not followed. Risk is a function of both toxicity of the materials on site and the degree of exposure to the hazardous waste. (*Effects of Future Land Use Assumptions on Environmental Restoration Decision Making*, DOE, Office of Environmental Policy and Assistance, RCRA/CERCLA Information Brief,

DOE/EH-413/9810, July 1998, p.1) Institutional controls depend on limiting exposure to toxic materials and do nothing to lessen the toxicity of these materials. After institutional controls are implemented, the toxic materials that originally triggered the Superfund cleanup are still on site to threaten human health and the environment.

Superfund should be concerned about treating hazardous wastes so that they are no longer toxic and, if treatment of the waste is technically impossible, removing the hazardous waste to a repository where the waste will no longer threaten human health and the environment. "Our obligation is to free subsequent generations of the responsibility for caretaking our hazardous residues, not to saddle them with housekeeping chores which, if neglected, will result in the re-pollution of the environment that we worked so hard to clean." (Jack A. Caldwell and Charles C. Reith, *Principles and Practice of Waste Encapsulation*. Boca Raton: Lewis Publishing Co., 1993, p. 35.) Wastes that are institutionally controlled are still a permanent threat to human health and the environment.

The cleaner a site is after remediation, the greater the potential land uses for that site. The more contamination left after remediation, the less the potential land uses are for the site. "Citizens have pushed for the highest cleanup standards, arguing that an unrestricted use would allow a wider range of future development at the site." (Wernstedt, et. al., *Basing Superfund Cleanups on Future Land Uses: Promising Remedy or Dubious Nostrum?*, Resources for the Future, Discussion Paper 98-03, October 1997, p. 17) The institutional controls being considered in the ESD for Montana Pole Plant would seriously limit productive land uses and greatly compromise the property rights of owners. The extensive reliance on institutional controls is also contrary to the Superfund mandate of preference for treatment and cleanup over institutional controls that restrict land use in perpetuity. If the goal is to encourage productive land uses after Superfund cleanup, a clean site affords the most encouragement. If the goal is to protect human health and the environment, these toxic materials must be treated and/or removed.

The thesis of my comments is that the use of institutional controls for Montana Pole Plant should be minimal. Instead of extensive use of institutional controls to deal with the Montana Pole Plant contaminants be removed to a safe repository

The reasons for this conclusion are:

1. Institutional controls do not meet the Superfund mandate of really cleaning up a site. To clean up means to make free of contamination.
2. Institutional controls are not permanent remedies. Rather, institutional controls permanently leave pollutants in place.
3. Institutional controls do nothing to reduce the toxicity of the hazardous materials. Lead, arsenic, mercury, and cadmium don't naturally attenuate over time, but keep their toxicity indefinitely.
4. Institutional controls are designed, implemented and monitored poorly.
5. Institutional controls have inherent enforcement problems.
6. Institutional controls have severe legal problems that work against effective reduction of the threats to human health and the environment posed by toxic materials.
7. Institutional controls are ineffective.
8. Institutional controls for a Superfund site are usually the result of a defective process that limits public participation and which leads to a haphazard development of institutional controls for a particular site.
9. Institutional controls are poorly understood and poorly defined.

Institutional Controls are not Effective

A. The EPA itself has found significant problems with the effectiveness of institutional controls. For example, in an article entitled "EPA, Think Tank Studies Show Superfund Land-use Controls

Flawed, December 10, 2001” which summarizes “Superfund Report via Inside EPA.com” by Resources for the Future, we find the following conclusions:

1. Institutional Controls are not reliably implemented. The EPA study found that over half of the institutional controls implemented under EPA issued records of decision are mischaracterized and that half of the institutional controls were not implemented according to EPA plans.
2. Institutional Controls are dramatically underfunded.
3. Monitoring of institutional controls is poor. Another study of California Superfund sites entitled: “Analysis of Institutional Controls at California Superfund Sites” by Erwin Tam of the University of California—Berkeley found that 30% of the sites had no inspection schedule as required by law and in 63% of the cases it was felt that compromise of the institutionally controlled site was likely.
4. Enforcement of institutional controls is poor.
5. ROD’s tend to have “vague or inconsistent references” to institutional controls.

In a study done by English, et. al. of the University of Tennessee entitled *Institutional Controls at Superfund Sites*, (July 1997. Hereinafter cited as *Institutional Controls at Superfund Sites.*), which was funded in part by EPA; the EPA’s remedial project managers admit the above listed problems (1-5) with institutional controls. The report concludes: “Perhaps most importantly, the results of this study point to a fairly strong sense of unease on the part of some RPMs with the efficacy of institutional controls. This finding is consistent with discussions in the literature on the efficacy of institutional controls.” (p.67) No wonder noted engineers Jack A Caldwell and Charles C. Reith stated in their book *Principles and Practice of Waste Encapsulation*, that “Planners of long-term disposal systems have long recognized the difficulty of maintaining institutional control over property. . . .” (p. 35)

B. “To the extent that responsibility for selecting and maintaining the long-term effectiveness of the remedy will become contingent on the intent and actions of a more diffuse set of institutions—local government, private property laws, current and future property owners, land recordation offices, the courts—the ultimate effectiveness of a remedy to protect human health and the environment will become increasingly difficult to assess.” (Hersh, et. al., *Linking Land Use and Superfund Cleanups: Uncharted Territory*, Center for Risk Management, 1997, p.49. Hereinafter cited as: *Linking Land Use.*) If institutional controls become a prime remedy for the Montana Pole Plant, the community will have to live with these controls, effective or not, in perpetuity.

C. The success of institutional controls will depend on changing the way people behave which is very difficult.

Managing human behavior is an extraordinarily difficult task. None of the institutional controls in use, or under consideration for future use, is foolproof. None can reduce to zero the risk of human or environmental exposure to hazardous substances left in place at a site. Nor is there a universal, all-purpose institutional control appropriate for all sites.

(Environmental Law Institute, *Protecting Public Health at Superfund Sites: Can Institutional Controls Meet the Challenge*, 1999, p. 13. Hereinafter cited as *Protecting Public Health.*)

The risk of human exposure is considerably less if the toxics are treated to make them non-toxic or if they are removed to a repository where the public cannot come in contact with them.

D. The relationship between land use and toxic exposure is not well understood and can have a great deal of variation.

Institutional Controls have Inherent Limitations

A. Institutional controls do nothing to reduce the toxicity or volume of contaminants. Institutional controls, per se, are not that effective in reducing mobility of toxics off-site. To be protective of human health and the environment, institutional controls would have to last as long as the toxics last.

“Substances such as lead, mercury, arsenic, and cadmium will not degrade at all and will remain potentially hazardous unless removed or treated. In order to effectively protect against exposure to such long-lived risks, institutional controls would need to last essentially for as long as humans are expected to live on the planet.”

(*Protecting Public Health*, p. 13.) No institutional control has this needed level of permanence. If institutional controls are used instead of removal and/or treatment, these controls will have to work in perpetuity. Remember, toxics such as those found at the Montana Pole Plantme do not lose their toxicity over time. Yet, institutional controls are predicated on the designated land use of a sight existing in perpetuity—a flawed assumption. Land use changes are the most frequent changes in a locality.

B. Institutional controls also increase the likelihood that people will unknowingly be exposed to hazardous materials. Leaving contamination on site will always pose a threat of exposure if the institutional control fails. Predicting the long-term efficacy of an institutional control system is very problematic.

C. As we saw with regard to lead exposure, very often, as time passes, it is determined that the contamination in place is more dangerous to human health and/or the environment than originally thought. In such a situation, the in-place institutional controls may not be sufficiently protective of human health and the environment. “Questions then arise about who should be responsible for additional controls or remediation, and about whether residual contaminants should be allowed only if their risks and methods of containment are well understood.” (*Institutional Controls at Superfund Sites*, p. 36.) It is critical that we get the most protective remedy the first time around.

D. Since the implementation of institutional controls depends on people, human error or neglect is a constant problem. After a remedy is selected, the degree of interest in the implementation of the remedy does not match the degree of interest shown during the remedy selection process. “Residual hazardous substances are a classic example of a problem that is not readily apparent, and the tasks associated with implementing institutional controls are unlikely to be the focus of widespread public attention in many cases. Thus, decision makers should plan for a relatively high probability that the person charged with the responsibility to implement an institutional control will fail to do so because that task is not a high priority for that person or because it is a task without a specific deadline and can therefore be postponed indefinitely.” (*Protecting Public Health*, p. 103) The efficacy of an institutional control depends on human judgment and “the judgment of any individual may be questionable in a specific situation and a poor judgment about implementing institutional controls could cause people to be exposed to hazardous substances.” (*Protecting Public Health*, p. 105)

The Meaning and Understanding of Institutional Controls is Problematic.

A. What are the institutions that will be charged with controlling the toxics? How will these institutions coordinate their activities? Who will devise these institutional controls? Who will have enforcement responsibility? How will these controls be enforced?

What is meant by controls? To what extent will the nature of these controls be the result of political processes rather than good protective environmental and scientific technology? Who will monitor the institutional controls? How often will the controls be monitored? How will they be monitored? All of these questions must be satisfactorily answered before the public can have any confidence in the protectiveness of the controls. Yet, in far too many cases where EPA has extensively utilized institutional controls, these questions have never been answered. Nor is there any consensus as to how they should be answered.

B. “When we admit societal values, power, political leverage, and notions of rights and duties into the picture, it becomes difficult to see ‘controls’ as anything but contested, and hence problematic.

For institutional controls are not stagnant features of a remedy but are made and unmade in the course of experience by regulatory statutes, by the acuity of government oversight, by negotiations at planning board meetings, by the attitudes of bankers, developers, and others involved in real estate, by the limitations of scientific understanding of the health risks posed by toxic chemicals, by the vast and evolving corpus of real property law, by public trust in government or the lack thereof, and, in a broader sense by the constellation of rights and responsibilities that inform a societal ethic.” (*Linking Land Use*, p. 52. See also: T. Beatley, *Ethical Land Use: Principles of Policy and Planning* (Baltimore, MD: Johns Hopkins Press, 1994 and R. Platt, *Land Use and Society: Geography, Law and Public Policy* (Washington, D.C.: Island Press, 1996)
Even if there were some agreement on the nature and role of institutional controls, that agreement would be fleeting.

The Effectiveness of Institutional Controls is Compromised by a Dependency on Local Government.

A. It is impossible for local government to predict future land uses. Most land use planning is done in a very piecemeal, incremental fashion. One of the great faults of incremental decision-making is its inability to predict accurately or to plan for possible future events that differ from the present.

B. Often the development of institutional controls occurs after the record of decision has been determined. This later development limits public participation and limits local government input into the design and implementation of institutional controls. If institutional controls are imposed on local government after secret consent decree negotiations, local governments may well see no compelling reason to be pro-active in enforcing or monitoring these controls.

C. Often the development of specific institutional controls is more of a political process rather than a technical or scientific process. The essence of the political process is compromise which compromises may not be protective of human health and the environment. “When institutional controls are used to assure protection of human health and the environment, the technical adequacy of the remedy becomes dependent on a number of non-technical factors over which EPA has little influence. These include: the efficacy of local government administration; the consistent application of zoning ordinances; the ability of private property restrictions (such as easements and restrictive covenants) to bind both current and successive users of the sites; and prompt enforcement.” (*Linking Land Use*, p. 7.) Land use planning on the local level is often not systematic but results from the compromises that are endemic to the political process. Often land use planning decisions represent the interests of developers, bankers, real estate agents, and etc. rather than the interests of the general public.

D. The lack of consistency in developing and applying land use controls on the local level means that institutional controls are not very dependable or reliable. “In no area of American law are there such frequent requests for amendments to the law (rezoning requests) or minor revisions to the law under the guise of an administrative actions (variance, special exemptions, and so forth.” (*Linking Land Use*, p. 61) In fact changing zoning is the most common form of land use action which local government takes. (*Ibid.*, p. 62) E.D. Kelly in “Zoning” states this process is inherently “unpredictable and unfair.” (Found in *The Practice of Local Government Planning*, 2nd ed., ed. F.S. So and J. Getzels (Washington, D.C.: ICMA Training Institute, 1988) Variances are also frequently given. B. Collingsworth in *The Political Culture of Planning* notes: “Various studies have convincingly shown that boards of adjustment (or appeal) commonly operate according to their own sense of what is right, with little regard to the law, or even their local planning department.” (New York: Routledge, 1993, p. 7) English, et. al. conclude in *Institutional Controls at Superfund Sites* that: “local governments can repeal or modify any ordinance that they create. In no other area of American law are there such frequent requests for amendments to the law, and decisions about land use have been among the most controversial and contested issues in many communities.

Furthermore, some zoning ordinances place few locational constraints on residential construction, and, especially if a local government does not agree with the proposed Superfund remedy, it may be unwilling to cooperate by amending its zoning ordinance.” (Energy, Environment, and Resources Center, University of Tennessee, July 1997. Hereinafter cited as: *Institutional Controls at Superfund Sites*.) For example, most restraints on local governments ability to change zoning regulations are procedural not substantive.

E. Local governments also face serious problems regarding the long term, permanent application of institutional controls. Enforcement of institutional controls by local government has been called “the weakest link of the chain.” (Claudia Kerbawy, telephone interview with Robert Hersh, November 1995. Kerbawy is Chief of 307, Environmental Response Division, Michigan Department of Environmental Quality, Lansing, Michigan quoted in *Linking Land Use*, p. 65.) E.D. Kelly in *Enforcing Land Use Controls* calls local enforcement and monitoring of institutional controls “a planner’s paradise but an enforcement nightmare.” (Planning Advisory Service, Report Number 409 [Chicago: American Planning Association, 1988], p. 4)

F. The effective use of institutional controls demands coordination between and among several levels of government—a difficult, if not impossible, task. Several government agencies may be charged with selecting and implementing the institutional controls. The lack of coordination and cooperation between these agencies can doom institutional controls to failure. So often in the past, institutional controls have been selected on the federal level and the local government has been charged with implementation. Yet, often the local government does not have the authority, funding, interest in or commitment to the institutional controls imposed on it. Coordination and commitment problems can mean that the institutional controls will not be implemented as planned and will not be effective. “The entities responsible for implementation and operation of institutional controls must support the controls selected and have the authority, resources and commitment to enforce them. Because institutional controls may be essentially an unfunded mandate and can conflict with other interests of a locality or state, such as economic development, local acceptance is particularly important.” (*Protecting Public Health*, p. 98)

G. The often-poor record keeping of the land use conditions that have been imposed on a Superfund site also compromise enforcement. Even conscientious developers may not be able to ascertain what restrictions have been placed on a piece of property they wish to develop.

H. Problems with local funding also limit the enforcement of institutional controls.

“The long term efficacy of institutional controls must be based on regular monitoring, PRP or site owner compliance, and prompt enforcement; yet funding for environmental monitoring and enforcement at the local level has been reduced, and noncompliance with property-based restrictions can be difficult to detect. With deep funding cuts for environment enforcement activities at both the federal and state levels, there is a strong possibility that noncompliance with institutional controls will go unnoticed. Institutional controls work only if they are complied with. While this is true of any site remedy, institutional controls require monitoring and enforcement over long time periods and are thus more problematic. If we define a right to exist only when there is a system to protect the holder of the right from action or claims of another, to what extent should we see the increased use of institutional controls as a process that reduces the rights of nearby residents or workers on remediated sites while privileging those of past polluters? ” (*Linking Land Use*, p. 68)

I. Local and state governments experience great turnover of staff. Institutional knowledge about the institutional controls is lost when there is a constant turnover of knowledgeable personnel.

Legal Issues Limit the Effectiveness of Institutional Controls

A. Another problem complicating the use of institutional controls is the courts. The courts can potentially play a significant role on land use decisions and land use decisions can be very litigious.

“Although the courts try not to make substantive zoning decisions, judicial attacks on local land use regulations are well documented in case law and in the planning literature and constitute yet another source of uncertainty to the effective working of institutional controls at Superfund sites. In view of the wide variation in the decisions of state and appellate courts concerning the limits of police power to regulate land use and the need for Constitutional protection for the individual, it is easy to envisage the possibility that an owner of a site that is encumbered with a use restriction may challenge and successfully invalidate an institutional control, such as a zoning restriction, on the grounds that the restriction will cause a severe burden and, as such, constitutes a taking of private property by the government.” (*Linking Land Use*, p. 64)

B. The NCP does not clearly specify the legal authority for institutional controls. Because there are no detailed statutory specifications of institutional controls, institutional controls are often left to the end of the remedy selection process where public input is minimal. Leaving them to the end is problematic in that: “If you leave institutional controls to the last and you can’t get them implemented, then you’re stuck. You’re at a dead end rather than the destination of the record of decision (ROD).” (Claudia Kerbawy, *op.cit.*, p. 53)

C. On a practical level, it is unclear who should monitor and enforce the institutional controls. RODs usually have little specificity regarding the implementation and monitoring of institutional controls. Often the specification of the nature and types of institutional controls is very general. Questions abound regarding what kind of monitoring will be performed, who will perform the monitoring, how and what type of enforcement will occur, what will be the frequency of the monitoring, and who is responsible for maintaining the protectiveness of the institutional control arrangements. The technical remedy is determined first and then institutional controls are developed to protect the remedy. Yet, it is often difficult to get acceptance by property owners or PRPs after the ROD is issued

D. Given that issues related to institutional land use/property control are not based in federal law but are based in state property laws or the local police power, federal control of institutional controls on the local level is very limited. CERCLA provides EPA with oversight authority over institutional controls that are part of the ROD remedy but CERCLA provides no mechanisms to enforce that control. Every five years, EPA can amend a remedy when contaminants are left in place, but during that five-year period the supervision of institutional controls is with the local government. Much to compromise a remedy can happen in five years. Moreover, there are serious proposals in Congress to remove the five-year review process. Hence, federal supervision of institutional controls is very problematic and could disappear altogether.

E. It is very problematic whether an institutional control on a current owner of a particular property would bind subsequent owners of that property. “Can third parties (for example, community groups or the local government) enforce a restriction at a site if the property owner fails to comply with the control and the holder of the easement, for example, (EPA, a PRP, the state government, or a local government if signatory to the agreement) fails to act properly?” (*Linking Land Use*, p. 57) In *Environmental Regulation of Real Property*, N. Robinson comments that institutional control covenants are very complicated and that “they often defeat the attempts of parties to write covenants which will be enforceable against successors.” (pp. 6-16) For example, the form of future property ownership must be similar to the existing type of property ownership for an institutional control restriction to continue in force. Once a property is sold to a new owner, monitoring of what the new owner does on the property is diffuse if it exists at all.

What happens in a commercial venture if the purchaser of the property goes bankrupt? Who is responsible for the institutional control restrictions on the property? Who will enforce these restrictions? State laws regulating the use property are Byzantine.

“The common law tradition of different types of ownership could limit long-term effectiveness of (institutional controls’) reliability if they fail to bind third parties to the agreements worked out in the consent decree, and the question of authority—who holds an easement and on what legal basis can the government or some other entity challenge noncompliance with the easement or deed restriction—is, again, open to interpretation. These issues suggest that proprietary controls, negotiated between PRP/site owners and government (federal, state, local) may be insufficient by themselves to effectively ensure the long-term safety of the public from residual contamination. Their reliability hinges on how carefully they are devised, the authority and willingness of the party holding the rights to use them, and the willingness of a property owner to comply.” (*Linking Land Use*, p. 58)

F. Multiple owners or multiple use of a site also compromise the ability of government to police institutional controls.

G. The “touch and concern” doctrine can limit the efficacy of real covenants in the institutional control process. “Equitable servitudes” also are limited in their effectiveness by the “touch and concern” requirement.

H. Liability under institutional controls is problematic.

“When institutional controls are created, it is important to determine who will be liable in the event they fail. Even if the EPA has entered into a consent decree at the time of the initial site remediation releasing PRPs from liability for residual contamination, questions remain about liability if the institutional controls are violated. For example: If the current property owners allow development that violates use restrictions, are they liable, are the original PRPs liable, or both?

If people are harmed by such a violation, would they be able to sue the current property owners, the original PRPs or both?” (*Institutional Controls at Superfund Sites*, p. 34)

I. Another difficulty is that land use controls are “vulnerable to changing legal interpretations about the nature of property rights.” (Wernstedt, et. al., *Basing Superfund Cleanups on Future Land Uses: Promising Remedy of Dubious Nostrum?*, Resources for the Future, Discussion Paper 98-03, October 1997, p. 16) For example, if the courts expand the scope of takings decisions to increase the extent to which government regulations are viewed as a “taking” then the efficacy of institutional controls will be diminished.

EMAIL

From: [REDACTED] <[REDACTED]@yahoo.com>

Sent: Tuesday, February 25, 2020 8:01 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment Montana Pole Plant--This time with page numbers.

Submitted by: [REDACTED]

Risk assessment is an inherently flawed and biased approach to trying to determine how much pollution should be permitted to persist on the planet.

The basic idea behind risk assessment is to try to ultimately find an acceptable level for human toxic exposure. Risk assessment assumes that a certain level of toxic exposure is allowable or appropriate. It is analogous to saying that a certain level of spouse abuse is allowable or appropriate. Risk assessment can actually sanction the release of highly toxic materials such as dioxin, for which there are no safe levels of exposure, through allowance of so called acceptable levels of discharge.

Risk assessments are fraught with uncertainty, unpredictability and subjective decision making. The process tends to be arbitrary and discretionary. Risk assessment does not exclude the bias of the person doing the study and/or the organization for which the person works. Where acceptable levels of exposure are set depends on who is doing the study. A former head of EPA said: You can design a risk assessment to get any result you want. "The logical method and form flatter that longing for certainty and for repose which is in every human mind. But certainty generally is an illusion and repose

is not the destiny of man." Oliver Wendell Holmes. In reality, risk assessment is a subjective, political process; not an objective, scientific process.

But the concern here is not the inherently flawed process of risk assessment; the concern should be that MDEQ wants to leave dioxin, which is mobile at the Pole Plant, on site as a permanent threat to human health.

Butte residents should take no comfort in MDEQ's plan to leave deadly dioxin in place at the Montana Pole Plant. MDEQ wants another waste-in-place, i.e. threat in place solution for Butte.

As I said, I want to focus on the health threat posed by dioxin at the Pole Plant.

1. Current dioxin discharge from the Montana Pole Plant into Silver Bow Creek does not meet water quality standards.
2. The water quality standards set by the ROD for Montana Pole Plant are very permissive and less restrictive/protective than national standards. So meeting these lax standards does not protect human health and the environment. But even these lax standards are not being met.
3. The current ground water treatment system in place at Montana Pole Plant discharges dioxin into Silver Bow Creek at 100 times the lax water quality standards.

4. This current discharge at 100 times the permissive water quality standards will continue for decades.

5. MDEQ has decided not to adhere to the cleanup standards in the ROD for Montana Pole but will waive them. MDEQ, without full investigation, has abandoned bio-remediation.

As I said, the current proposal is to leave dioxin in place at the site. Why is this so problematic?

Because dioxin is highly toxic and there are no safe levels of exposure to dioxin. The current waste left in place solution is unlikely to protect present and future generations from exposure to the dioxin at the Pole Plant. The MDEQ proposed solution is unlikely to protect human health and the environment.

This paper makes the following arguments:

A. Dioxin is a deadly carcinogen that produces severe and serious health effects in addition to cancer.

B. Contrary to the goal of Superfund to treat toxic waste instead of leaving it in place and to reduce the toxicity, mobility and volume of contaminants, MDEQ plans to cap the dioxin in place.

C. The proposal by MDEQ to leave dioxin in place is not protective of human health and the environment because capping has serious problems.

D. Because dioxin is mobile at the Pole plant, the caps will not be protective.

E. The use of institutional controls at the site is very problematic. Problematic institutional controls threaten the release of dioxin at the Pole Plant

F. The balancing criteria of cost has been misapplied by MDEQ resulting in leaving an unacceptable dioxin threat in place.

G. MDEQ has failed to apply the legally mandated principles of Pollution Prevention and the Precautionary Principle to the threat posed by dioxin at the Pole Plant.

Dioxin at the Montana Pole Plant still presents a significant, unremediated threat to human health and the environment. MDEQ has allowed this condition to go on for years while misinforming the public as to the protectiveness of the remedy.

There are no safe levels of exposure to dioxin. An EPA report in 2012 concluded that, after reviewing mounds of evidence, there are potentially serious health effects at ultra-low levels of exposure to dioxin. Dioxin is a known carcinogen. (World Health Organization). Other scientific studies have linked dioxins to disrupted hormones, reproductive damage such as reduced sperm counts, neurological effects in children and adults, immune system changes and skin disorders. (EPA, Environmental Health News, National Institute of Environmental Health Sciences) Studies have shown serious health effects at parts per trillion exposure to dioxin. No wonder dioxin is considered to be one of the most toxic substances known to human beings.

The EPA lists the following as health risks associated with dioxin.

Dioxins are highly toxic and can cause cancer, reproductive and developmental problems, damage to the immune system, and can interfere with hormones.

The World Health Organization states: "Dioxins are highly toxic. They belong to the so-called 'dirty dozen'—a group of dangerous chemicals known as persistent organic pollutants. Dioxins are of concern because of their highly toxic potential. Experiments have shown they affect a number of organs and systems." (Dioxins and their effects on human health, WHO, October 2016) "Dioxins are a group 1 human carcinogen." (Smith and Lpiperio "Invited Commentary: How Do the Seveso Findings Affect Conclusions Concerning TCDD as Human Carcinogen?," American Journal of Epidemiology, June 2001.)

Dioxin is an undisputed human carcinogen, causing cancers of the liver, lung, mouth, nose, thyroid gland, adrenal gland, lymphatic system and skin.

Dioxins also tend to accumulate in the body and are not easily expelled.

"First, dioxin's effects on the immune system, reproduction and infant development are much more significant than previously thought. Second, there is no safe dose below which dioxin causes no biological effect. Third, quantities of dioxin and dioxin like chemicals present in people's bodies are already at or near level shown to cause problems in animals." EPA report on dioxin, 1994, quoted in ecologist Sandra Steingraber, *Living Downstream: An Ecologist Looks at Cancer and the Environment*, p. 214.

Additional References: ATSDAR, December 1998, National Toxicology Program January 2001 and International Agency for research on Cancer, 1997

The tragic consequences of exposure to dioxin have been verified by the effects of Agent Orange on service personnel, Times Beach in Missouri and Love Canal in New York.

Dioxin is Mobile at the Montana Pole Plant

This mobility compromises the protectiveness of any proposed caps at Montana Pole Plant. This mobility is demonstrated by technical/scientific literature on the subject as well as statements by EPA and MDEQ specifically regarding the Pole Plant.

Dioxin is mobile in soils such as those at the Montana Pole Plant. The ROD for Montana Pole itself says that it is possible for dioxin in soils to migrate. (Page 14) There are present in the Montana Pole Plant soils co-contaminants that can mobilize dioxin. In addition, the caps as presently proposed will not prevent surface water and other contaminants from leaching down and mobilizing dioxin. Given the problems of caps with bio-irrigation, advection, desiccation, erosion, weathering, bio-intrusion and stabilization, the dioxin in the soil will be mobilized. Only in a pure lab setting does dioxin remain non-mobile. Certainly the Montana Pole Plant is not a pure lab setting. (See: Dioxin reservoirs in southern Viet Nam--A legacy of Agent Orange by Divernychuk, et al in *Chemosphere* 47 (2002) 117-137. Similar findings are reported in the following:

1. Soil-Plant Transfer of Polychlorinated Dibenzo-p-dioxins and Dibenzofurans to Vegetables of the Cucumber Family (Cucurbitaceae) Anke. Huelster , Jochen F. Mueller , Horst. Marschner *Environ. Sci. Technol.*, 1994, 28 (6), pp 1110–1115 DOI: 10.1021/es00055a021 Publication Date: June 1994 (Article: Indicates that dioxin is mobilized in soils as the result of plant activity. Given that there will

only be a 16 inch cap over dioxin contaminated soils and the cap will have vegetative cover, the vegetative cover will absorb dioxin and bring it to the surface.)

2. Sorption of 2,3,7,8-tetrachlorodibenzo-p-dioxin to soils from water/methanol mixtures Richard W. Walters , Annette. Guiseppi-Elie Environ. Sci. Technol., 1988, 22 (7), pp 819–825DOI: 10.1021/es00172a012 Publication Date: July 1988

3. Study by U.S. Dept. of Agriculture indicated that dioxin is only immobile in soils devoid of other organic material. If any organic co-solvents, as are present at the Pole Plant, are in the soil, mobility will occur.

4. SUBSTANTIAL MIGRATION OF DIOXINS IN AGROCHEMICAL

FORMULATIONS, Grant, Sharon, Mortimer, Munro, Stevenson, Gavin, Malcolm, Don and

Gaus, Caroline, The University of Queensland (National Research Centre for Environmental Toxicology (EnTox)), 39 However, the presence of co-contaminants can act as transport facilitators for otherwise low mobility

organic compounds (LMOCs) These results highlight that the paradigm of LMOCs being non-mobile in soils should be considered carefully together with application specific and environmental factors which may have the ability to considerably change the predicted environmental fate of these chemicals.

(This article supports the above mentioned study by the U.S. Department of Agriculture that if, as we find at the Pole Plant, co-contaminants are present, dioxin does become mobile in soil.

The point is that since the remedy for the Pole Plant was changed from one of active treatment to containment, co-contaminants that will make dioxin mobile in soil will be present.

5. Assessment of Dioxin Contamination at Sawmill Sites: A Report to the Ministry for the Environment by Tonkin & Taylor Ltd and SPHERE, Prepared for the New Zealand Ministry for the Environment

October 2008 (conclusions are similar to the one's I included in my earlier email to you today, i.e. that dioxin is mobile in both soil and water.

Also, data presented by the MDEQ at a CTEC meeting indicated that dioxin is present in the recovery trenches at the Pole Plant. If dioxin isn't mobile in soil at the Pole Plant, how did the dioxin get in the recovery trenches? Another point that was made at the CTEC meeting: MDEQ is in charge of the cleanup in Missoula of the White Pine Sash site. This site was a wood treatment facility similar to Montana Pole. The MDEQ acknowledges at this site that dioxin can be mobile in soils. Why not acknowledge the same at Montana Pole? Finally, the dioxin levels that we are now seeing in groundwater at the Montana Pole Plant were not supposed to have been reached until 200,000 years from now according to MDEQ. Why, if dioxin is not mobile, are we seeing dioxin now that we should not have seen for 200,000 years?

The point is: Given the highly toxic nature of dioxin, given the mobility of dioxin at the Pole Plant and given the problematic efficacy of long term capping, the prudent course would be to treat dioxin or remove it; not leave it in place as a permanent threat to human health and the environment.

Dioxin is much more potent than the contaminants that make up the catalyst for Butte's cleanup. I repeat: THERE ARE NO SAFE LEVELS OF EXPOSURE TO DIOXIN.

Removing or treating the dioxin is congruent with Superfund law that mandates treatment over containment, permanency, and the reduction of the toxicity, mobility and volume of contaminants. Removing or treating the dioxin is also congruent with Montana law that requires the application of the Precautionary Principle and the Principle of Pollution Prevention to the operations of MDEQ, which is the "lead" agency at the Pole Plant.

Montana Law Mandates the Application of the Principle of Pollution Prevention and the Precautionary Principle to the Cleanup of Montana Pole Plant

In interpreting the meaning of Articles II and IX of the Montana Constitution, the Montana State Supreme Court in *Montana Environmental Information Center v.*

Department of Environmental Quality and Seven-Up Pete Joint Venture (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236) found that Pollution Prevention and the Precautionary Principle were part of the Montana Constitution's guarantee to citizens of a clean and healthy natural environment, i.e. these principles are part of Montana law. The Court found that "the right to a clean and healthful environment is a fundamental right. . . ." In analyzing the discussion and debate at the 1972 Montana Constitutional Convention, the Court determined that it was the clear intent of the participants that the environmental rights guaranteed in Articles II and IX were interrelated and that these two Articles espoused the principles of pollution prevention and the precautionary principle. For example, the Court cites Delegate McNeil who said in discussing how Article IX's subsections (1) and (3) were related: "It goes further than that and directs the Legislature to provide remedies to prevent degradation. This is anticipatory." (Emphasis supplied.) It was also clear during the discussion and debate during the Montana Constitutional Convention that the delegates intended the environmental provisions of the Constitution to mandate an "improvement" of the natural environment. The Court stated: "In doing so, we conclude that the delegates' intention was to provide language and protections which are both anticipatory and preventative. The delegates did not intend to merely prohibit that degree of environmental degradation that can be conclusively linked to ill health or physical endangerment. Our constitution does not require that dead fish float on the surface of our state's rivers and streams before its farsighted environmental protections can be invoked..." The Montana Supreme Court's decision is an unambiguous and binding statement that the Principles of Pollution Prevention and the Precautionary Principle/Rule must direct the administration and implementation of ALL state laws, rules, and regulations.

The goal of Montana's pollution prevention program is to "prevent pollution before it occurs. Pollution prevention is the highest step of the waste reduction hierarchy and occurs prior to the other steps of recycling, treatment, or disposal." (MDEQ, What is Pollution Prevention?) See also: MCA 2003, 75-10-601; 75-1-602, 8 (b) (iii) and 75-1-103 (1) and (2) (a)

Black's Law Dictionary also provides guidance as to the meanings of the concepts articulated in the Montana Supreme Court case above quoted.

Black's defines potential as "Existing in possibility but not in act." Threat is defined as a "menace." Imminent is defined as: "Near at hand; mediate rather than immediate, close rather than touching, perilous." Substantial is defined as of "Importance." Certainly, dioxin left in place at the Montana Pole Plant site would present a potential threat and a substantial, imminent threat as defined in Black's Law Dictionary.

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Given that MDEQ is the “lead” agency for Montana Pole and given the legal relationship mandated in CERCLA in regard to the relationship between state and federal regulatory protocols, rubrics and standards, the Montana requirement that the Precautionary Principle and the Principle of Pollution prevention inform and guide remediation decisions must be respected by EPA and MDEQ.

The point of Montana law and federal law is that it is better to prevent pollution before it harms public health and the environment rather than treat or mitigate the effect of pollutants after they are released. The medical motto: *Primum non nocere* (First, do no harm.) would apply to pollution prevention. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant consideration and remediation of contaminated dioxin now rather than waiting for these contaminants to be released and then trying to treat them later. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant removing as much of the dioxin as possible so as not to threaten future generations. Dioxin waste-in-place is a serious threat-in-place.

The Pollution Prevention Principle and the Precautionary Principle are in effect ARARs for the Montana Pole Plant in Butte

In effect, the provisions of the Montana Supreme Court decision *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236 as well as the other citations listed above become ARARs which must be met for the Montana Pole Plant Operable Unit. This point is clearly articulated in: *United States v. Akzo Coating of America, Inc.* No. 88-CV-73784-DT (719 F. Supp. 571, 30 ERC 1361) (E.D. Mich. August 9, 1989) ARARs do not have to be numerical standards but can be found in the law of the state. The Akzo court found: “CERCLA envisions a substantial and meaningful role for the individual states in the development and selection of remedial actions to be taken within their jurisdictions. CERCLA also accommodates the environmental standards and requirements of the state in which a site is located.” “Congress has not. . .displaced state regulation. . .” “CERCLA does not expressly preempt state law. . .” With specific regard to numerical standards that court found: “Although the state law does not contain specific numerical standards, it is, as the State contends, legally enforceable and of general applicability. The EPA’s own publication (EPA, Superfund Program; Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements; Notice of Guidance, 52 Fed. Reg 32495, 32498 (Aug. 27, 1987) recognizes that general requirements having no specific numerical standards to be enforceable ARARs. General State goals that are duly promulgated (such as a non-degradation law) have the same weight as explicit numerical standards. . . .” The Court cites numerous other cases to support its conclusion.

The proposed capping of toxic dioxin at the Montana Pole Plant is not a permanent solution. Caps always have problems and cap maintenance is a perpetual struggle. The history of capping toxic waste in Butte has been problematic indeed. The long term effectiveness of institutional controls is questionable. Given that the dioxin at the Montana Pole Plant is mobile, capping will be particularly ineffective and the use of institutional controls very problematic.

The point of the above discussion is that no one should be “comfortable” with leaving dioxin in place at the Montana Pole Plant. Dioxin at the Montana Pole Plant does not pose an acceptable risk but is a direct and persistent threat to human health and the environment.

EMAIL F

From: [REDACTED] <[REDACTED]@in-tch.com>
Sent: Tuesday, February 25, 2020 3:55 PM
To: [REDACTED] <[REDACTED]@mt.gov>
Cc: [REDACTED] <[REDACTED]@bsb.mt.gov>
Subject: [EXTERNAL] RE: Montana Pole Superfund Site re: Current Status

[REDACTED],

Thanks for reaching out. My main concern for the site is its appearance.

Don't consider the email as my only comment, but you can consider the email as a comment of my appreciation that things are finally happening. I will have additional comments under end land use.

As a preview of my thoughts, I am curious if end land use would allow the capped area be used as a shooting range to resolve the noise and safety conflicts that occur in the area behind Montana Tech. This might require a building (Brownfield funding or ?) or at minimum re-contouring the property to minimize noise and establish a safety berm.

[REDACTED]

From: [REDACTED] <[REDACTED]@in-tch.com>
Sent: Thursday, February 13, 2020 9:14 AM
To: [REDACTED] <[REDACTED]@mt.gov>
Cc: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@bsb.mt.gov>; [REDACTED] <[REDACTED]@epa.gov>; [REDACTED] <[REDACTED]@gmail.com>
Subject: [EXTERNAL] RE: Montana Pole Superfund Site re: Current Status

[REDACTED],

Please accept this email as a shout out for your work.

I was delighted to see the revised plans for the Montana Pole Site that were in the 2/13/20 Montana Standard. It is comforting to see that after so many years of inaction activity is underway.

I am curious what are the plans for the capped acreage? Could it be put back into beneficial use for the community? Have there been any discussions of long term use?

Thank you.

[REDACTED]

From: Larry Curran <[REDACTED]@in-tch.com>
Sent: Tuesday, September 24, 2019 9:42 AM
To: [REDACTED] <[REDACTED]@mt.gov>
Cc: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@mt.gov>
Subject: RE: Montana Pole Superfund Site re: Current Status

[REDACTED]

I have been monitoring the Montana Pole site in Butte this summer but did not notice any construction activity in 2019 as suggested in your email this spring. The site is a community eyesore.

I recently read where the Idaho pole site in Bozeman is up for delisting and redevelopment. That site looks like a grassy field and does not detract from Bozeman aesthetics. It would be nice to have the Montana Pole site look similar even if there are more restrictive use conditions.

Thanks.



EMAIL G

From: [REDACTED] <[REDACTED]@yahoo.com>

Sent: Wednesday, February 26, 2020 8:15 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@yahoo.com>

Subject: [EXTERNAL] Additional Public Comment on Montana Pole Plant

The Montana Pole Plant—Is the Site Clean; Is the site Safe and no longer poses a Threat to Human Health or the Environment; Is the Remedy Working? If not, why not? If not, when will it work?

Submitted by: [REDACTED]

In several ways the Montana Pole Plant is one of Butte's most dangerous Superfund sites. As is the case with so many other Superfund sites in Butte, the community is saddled with a sub-par cleanup of the Montana Pole Plant. The Montana Department of Environmental Quality (MDEQ), as well as the EPA, seems impervious to citizen concerns and steadfastly clings to this failed remedy. As the following pages indicate, there are serious shortcomings in the Pole Plant cleanup. Any talk of reuse of this land is premature until the threat to Butte's health and environment from the Plant is eliminated. Any talk of restoring Silver Bow Creek is premature until the threat from the Pole Plant is removed. The data, as well as many of the inferences from the data, that are contained in the following pages come from the EPA's and MDEQ's own documents.

The following pages make the following argument:

1. Dioxin is a deadly carcinogen for which there are no safe exposure levels.
2. Dioxin is present at the Montana Pole Plant. Hazardous furans, PCPs and PAHs are also present.
3. The cleanup of dioxin at the Montana Pole Plant is ineffective—dioxin will remain in the soils and dioxin will continue to pollute Silver Bow Creek.
4. The present cleanup of the Montana Pole Plant is not meeting cleanup standards.
5. The only protection afforded citizens from the deadly dioxin will be shallow caps over the contaminated soil which caps are not protective.
6. Institutional controls to be used at the site have been poorly characterized and have not worked at other similar sites.
7. The threat to the Pole Plant remedy from storm water runoff remains unaddressed.
8. The current Five Year Review of the Montana Pole Plant remedy refuses to independently review the quality of the cleanup.
9. MDEQ's attempts to involve the public in the Five Year Review have been abysmal. The impression is given that public input is superfluous and irrelevant.
10. There is a rush to reuse the Pole Plant before it is safe. Because this is a cash out site, MDEQ wants to hand this toxic turkey off to Butte Silver Bow as quickly as possible.

Dioxin and Montana Pole Plant—The Threat Remains—The Cleanup is Ineffective

I wish to specifically address dioxin and the Montana Pole Plant. Contrary to the assertions of the Montana Department of Environmental Quality (MDEQ) and EPA, dioxin at the Montana Pole Plant

still presents a significant, unremediated threat to human health and the environment. Until this problem is corrected, Silver Bow Creek cannot be fully restored and talk of future land use at the site is premature.

There are no safe levels of exposure to dioxin. An EPA report in 2012 concluded that, after reviewing mounds of evidence, there are potentially serious health effects at ultra-low levels of exposure to dioxin. Other scientific studies have linked dioxins to cancer, disrupted hormones, reproductive damage such as reduced sperm counts, neurological effects in children and adults, immune system changes and skin disorders. (EPA, Environmental Health News) Studies have shown serious health effects at parts per trillion exposure to dioxin. No wonder dioxin is considered to be one of the most toxic substances known to human beings.

The EPA lists the following as health risks associated with dioxin.

Dioxins are highly toxic and can cause cancer, reproductive and developmental problems, damage to the immune system, and can interfere with hormones.

It is my understanding that:

1. The dioxin cleanup levels for soils at Montana Pole are not being met and will not be met in the near future.
2. Current dioxin discharge from the Montana Pole Plant into Silver Bow Creek does not meet water quality standards.
3. The water quality standards set by the ROD for Montana Pole Plant are very permissive and less restrictive/protective than national standards. So meeting these lax standards does not protect human health and the environment. But even these lax standards are not being met.
4. **The current ground water treatment system in place at Montana Pole Plant discharges dioxin into Silver Bow Creek at 100 times the lax water quality standards.**
5. This current discharge at 100 times the permissive water quality standards will continue for decades.
6. **MDEQ has decided not to adhere to the cleanup standards in the ROD for Montana Pole but will waive them.**
7. Given points 1-6 above, how can MDEQ honestly claim that the site is remediated?
8. Given points 1-6 above, how can MDEQ legitimately claim that the Montana Pole Plant site does not pose a threat to human health?
9. The public is largely unaware of points 1-6 above. Community involvement activities conducted by MDEQ have been intermittent and ineffective. Not only has the public had little role in impacting the decisions regarding Montana Pole Plant, MDEQ has been ineffective in simply informing the public as to what is taking place in regard to the Pole Plant cleanup.

In the remainder of this message, I provide independent confirmation of my assertions from experts in the field. Often, too, the data I use is MDEQ's and EPA's own statements and data. MDEQ's cavalier dismissal of this information is shocking. Again, in light of this data, how can MDEQ and EPA say that the remedy is working to protect human health and the environment?

We must remember that according to the World Health Organization: “Dioxins are highly toxic and can cause reproductive and developmental problems, damage the immune system, interfere with hormones and also cause cancer.”

Dioxin poses a serious threat to both human health and the environment. There are **no** safe levels of exposure to dioxin. (EPA) In fact, dioxin has been referred to as the “most toxic chemical known.” (*Hazardous Waste in America*, Epstein, Brown and Pope) Lethal effects of dioxin can be seen at very low levels—a millionth of a gram can kill lab animals. Dioxin was the toxic found in Agent Orange and at New York’s Love Canal. Dioxin causes serious cancerous and non-cancerous human health effects. (World Health Organization) Dioxin can produce multiple types of cancer. Non-cancerous health effects include type 2 diabetes, impaired immune system, ischemic heart disease, endometriosis, decreased fertility, inability to carry pregnancies to term, birth defects and learning disabilities. According to a statement made by the National Institute of Environmental Health Sciences, the “dangers of dioxin last for decades after initial exposure.”

The Record of Decision for Montana Pole promised that the dioxins, furans, PCPs and PAHs found at the site (all are serious health threats) would be biologically treated and the site cleaned up. Contrary to the promise of cleanup, the MDEQ and EPA have reneged on this promise. MDEQ and EPA have largely abandoned treatment in favor of containment, leaving the threat in place. Now, cleanup will consist of leaving all of these toxics on site and “managing them” through institutional controls. The EPA itself says that the toxicity of dioxin exists for an extended period of time. Containment is contrary to the Superfund mandate that treatment is to be preferred over leaving waste in place. The shoddy cleanup at the Pole Plant perpetuates a public health threat that should and could have been fixed.

However, the current containment remedy is not working. Dioxin is still being released .The groundwater treatment system that was implemented at the Pole Plant site still allows for significant discharge of dioxin into Silver Bow Creek—100 times the current dioxin surface water standard. Such discharges will continue for decades to come. MDEQ’s own discharge study said that MDEQ’s planned cleanup approach would still allow dioxin to be discharged into Silver Bow Creek. MDEQ has ignored this problem and continues to implement a non-protective cleanup. Why was a sub-par cleanup approach selected? The threat to human health is particularly acute for those living near the Pole Plant. Local residents have had to endure not only a failed cleanup but tremendous odor problems caused by the MDEQ’s waste in place remedy.

The local EPA TAG group CTEC has called the problems associated with dioxin contamination to the attention of MDEQ and nothing has been done to address these issues. In comments submitted by CTEC to MDEQ on April 14, 2011 we find:

Dioxin in Treated Soils

Soil treatment at the site is not effective for reducing dioxin to meet the ROD cleanup level or EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites. CTEC is concerned that the current program of backfilling dioxin containing soils with a 1 ft cap of clean soil will not be protective of human health given potential future land uses, and may still provide a pathway for groundwater impacts. The failure of treatment to meet ROD cleanup levels warrants detailed evaluation in the Five Year Review.

Dioxin in Groundwater

Water quality standards for dioxin have been lowered since the ROD. The 2006 Five Year Review noted the need to evaluate lower dioxin standards, but a description of this evaluation has not been provided to the public. The Five Year Review needs to evaluate if cleanup levels for dioxin in groundwater are adequate given the new lower standards.

Extended CTEC Comments--Dioxin in Treated Soils

Treatment has not been effective at reducing dioxin levels in soil to meet ROD requirements. Data provided in the Second Five-Year Review indicates that soil with a dioxin level over 4 times the ROD cleanup level and 48 times higher than EPA industrial Regional Screening Levels (RSLs) is being backfilled at the site. Cleanup levels derived in the ROD assumed future recreational land use. The Five Year Review should evaluate if dioxin in soil will be compliant with recreational use and if not, disclose what types of reuse or institutional controls will be necessary.

The 2006 Five Year Review stated disposing of dioxin soils on top of clean fill extending at least one foot above the historical high groundwater mark and covered with at least one foot of clean fill is contemplated in the ROD. CTEC's review of the ROD does not find any contingency measures for backfilling soils which do not meet cleanup levels, including dioxin. A one foot cap of clean fill is insufficient for dioxin containing soils. Worms will actively bring dioxin contaminated soil to the surface if caps are not greater than the frost depth in Butte, which historically has been up to 5-6 ft. Backfilling soil with dioxin is a significant difference from the remedy proposed in the ROD, which alone warrants adequate evaluation and public comment and an Explanation of Significant Differences (ESD) given the significant nature of this remedy change. CTEC contends that the ROD should be amended to address treatment of dioxin containing soils because dioxin treatment is technically practical. Treatment of dioxin soils will prevent the need for additional institutional controls (ICs) which are inherently limited in protection due to cap failures, the need for perpetual maintenance, and limitations which ICs will place of future land reuse.

CDM's (2001) study of leachability of dioxins and furans predicted groundwater concentrations under extreme worst-case conditions of 37 pg/L; 18.5 times higher than the current groundwater quality standard. CTEC is concerned that the backfilling of dioxin containing soil could present a long-term source of dioxin to alluvial groundwater, for which no permanent dioxin treatment is proposed.

The ROD states waste should not be stored or disposed within the 100-yr floodplain. FEMA maps indicate the 100-yr floodplain includes a large portion of the site. The Five Year Review should provide maps of the 100-year floodplain and maps of locations where soils with dioxin levels exceeding cleanup levels have been backfilled. Soils containing dioxin should not be backfilled within the floodplain under the current ROD or any changes invoked with an ESD.

Alternatives to backfilling and institutional control need to be considered for soils which do not meet dioxin cleanup levels. CTEC recommends dioxin treatments such as using white rot fungi be used to optimize the remedy for treatment of waste and future land re-use.

Extended CTEC Comments--Dioxin in Groundwater

The 2006 Five Year Review states (pp19) average August 2005 influent TCDD concentration in groundwater is 19.46 pg/L and plant effluent averaged 0.518 pg/L. The 2006 Five Year Review also indicates dioxin concentrations up to 43.45 pg/L at the leading periphery of the contaminant plume. These concentrations exceed both current groundwater standards and surface water standards (for effluent).

The 2006 Five Year Review indicated that DEQ and EPA would evaluate modification of the cleanup standards for dioxins in groundwater and in discharge to surface water to the current standards, 2 pg/L and 0.05 pg/L respectively. To date, the public has only been provided with the statement that

the new water quality standards were considered during summer 2007 but that the existing remedy was deemed appropriate (DEQ December 2009 update), which does not explain how the need to meet current water quality standards was evaluated or the rationale for not adopting the current standards. The Five Year Review needs to describe in detail the evaluation of these updated water quality ARARs.

The dioxin concentration of 43.45 pg/L sampled at the leading periphery of the contaminant plume is 22 times the current groundwater standards and 869 times current surface water standards. An evaluation of groundwater impacts to surface water, springs and wetlands, once the groundwater capture and remediation system is no longer operated. A comparison of dioxin levels in groundwater at MPTP with background levels of dioxin in groundwater at other urban areas would be helpful for the public to understand the magnitude of dioxin levels. Evaluation of long-term fate of dioxin in groundwater needs to be incorporated into the evaluation of dioxin cleanup levels to meet current water quality standards.

CTEC's review of the Butte Alluvial and Bedrock Controlled Ground Water Area (BABCGWA) Petition and Final Order indicates that the controlled groundwater area designation was focused on the widespread metals contamination from mining and not dioxin. The plume of groundwater contaminated with dioxin may have expanded. The BABCGWA does not consider dioxin in water quality testing of wells completed in contaminated aquifers. It needs to be determined whether the BABCGWA will adequately protect the public and environment from drinking PCP or Dioxin contaminated water.

Please also note the following subsidiary information that relates to problem associated with the Montana Pole Plant cleanup:

The biological degradation rate of these compounds is generally very slow when compared to other organic compounds. Because PCDDs and PCDFs have very low vapor pressures, they do not readily evaporate or volatilize to the atmosphere. The compounds adhere tightly to soil particles and do not migrate readily or leach into groundwater or surface water unless the contaminated soil particles themselves migrate via erosion processes (Freeman, 1989). (Emphasis supplied.) page 14

Soil-Plant Transfer of Polychlorinated Dibenzo-p-dioxins and Dibenzofurans to Vegetables of the Cucumber Family (Cucurbitaceae) Anke. Huelster , Jochen F. Mueller , Horst. Marschner *Environ. Sci. Technol.*, 1994, 28 (6), pp 1110–1115 **DOI:** 10.1021/es00055a021 Publication Date: June 1994 (Article: Indicates that dioxin is mobilized in soils as the result of plant activity. Given that there will only be a 12 inch cap over dioxin contaminated soils and the cap will have vegetative cover, the vegetative cover will absorb dioxin and bring it to the surface.)

Sorption of 2,3,7,8-tetrachlorodibenzo-p-dioxin to soils from water/methanol mixtures Richard W. Walters , Annette. Guiseppi-Elie *Environ. Sci. Technol.*, 1988, 22 (7), pp 819–825 **DOI:** 10.1021/es00172a012 Publication Date: July 1988

Study by U.S. Dept of Agriculture indicated that dioxin is only immobile in soils devoid of other organic material. If any organic co-solvents as are present at the Pole Plant are in the soil, mobility will occur.

SUBSTANTIAL MIGRATION OF DIOXINS IN AGROCHEMICAL FORMULATIONS, Grant, Sharon, Mortimer, Munro, Stevenson, Gavin, Malcolm, Don and

Gaus, Caroline, The University of Queensland (National Research Centre for Environmental Toxicology (EnTox)), 39 *However, the presence of co-contaminants can act as transport facilitators for otherwise low mobility organic compounds (LMOCs) These results highlight that the paradigm of LMOCs being non mobile in soils should be considered carefully together with application specific and environmental factors which may have the ability to considerably change the predicted environmental fate of these chemicals.*

(This article supports the above mentioned study by the U.S. Department of Agriculture that if, as we find at the Pole Plant, co-contaminants are present, dioxin does become mobile in soil. The point is that since the remedy for the Pole Plant was changed from one of active treatment to containment, co-contaminants that will make dioxin mobile in soil will be present.

We must remember that according to the last Five Year Review of the Montana Pole Plant:

The cleanup levels for dioxins in soils are not currently being met and are not anticipated to be met if the current remedy operates as intended. CDM's Technical Memorandum Vadose Zone Soils Dioxin/Furan Mobility Evaluation, September 27, 2001, evaluation concluded that dioxins and furans are not likely to be treated, biodegraded, or leached from soils during bioremediation. . . . MDEQ admits that cleanup levels are not being met and will not be met. Yet, MDEQ clings to a remedy, which by their own admission, is not working.

The dioxin contamination problem is made worse because of storm water runoff through the Pole Plant. MDEQ admits that this is a problem but, so far, has done little to fix the problem.

1. The Record of Decision for the Montana Pole Plant clearly calls for active treatment of the waste as the primary cleanup method. The ROD does not support keeping waste in place as the primary or major approach to cleanup. Somewhere along the way, the emphasis on active treatment was changed to an emphasis on containment under caps. That was pretty clear at the Tuesday night (October 29, 2013) Pole Plant meeting.

Pages 6, 7, and 35 of the Pole Plant ROD clearly stipulate that active treatment will be the cleanup method. In the *Record of Decision—Montana Pole Plant* we find this quotation that exemplifies the position in the Record of Decision:

All accessible contaminated soils and LNAPL will be excavated to the extent practicable and treated, preventing this material from continuing to contaminate groundwater. The selected remedy will also satisfy the preference for treatment as a principal element of the remedy. Page 35

2. Active biological treatment **does work** on wastes such as we find at the Pole Plant and in our climate. For example, an article entitled: "Treatment of Dioxin Contaminate Soils," Standberg, et. al, published in November 2011 by the Swedish Environmental Research Institute provides compelling evidence of the efficacy of active biological treatment on wastes similar to those found at the Pole Plant and in a climate similar to Butte's climate. See also: *Biodegradation of Dioxins and Furans* by Rolf Wittich, July 15, 1998):

Bioremediation of organic pollutants and heavy metals by use of microorganisms represents a safe, inexpensive, and environmentally-friendly concept in modern environmental engineering. During the last three decades intense efforts have been made by microbiologists and environmental engineers in the isolation and characterization of microorganisms capable of degradation, transformation and detoxification of recalcitrant chemical compounds of environmental concern: (polyhalogenated) dibenzo-p-dioxins, dibenzofurans, and diphenyl ethers. Special emphasis is placed on the potential of molecular biology techniques to improve presently available biocatalysts. (Biodgradation of Dioxins and Furans by Rolf Wittich, July 15, 1998)

3. Dioxin is mobile in soils such as those at the Montana Pole Plant. The ROD itself says that it is possible for dioxin in soils to migrate. (Page 14) There are present in the Montana Pole Plant soils co-contaminants that can mobilize dioxin. In addition, the caps that are used will not prevent surface water and other contaminants from leaching down and mobilizing dioxin. Given the problems of caps with bio-irrigation, advection, desiccation, erosion, weathering, bio-intrusion and stabilization, the dioxin in the soil will be mobilized. Only in a pure lab setting does dioxin remain non-mobile. Certainly the Montana Pole Plant is not a pure lab setting. (See: Dioxin reservoirs in southern Viet Nam--A legacy of Agent Orange by Divernychuk, et al in *Chemoshpere* 47 (2002) 117-137. Similar findings are reported in the following:

- 1. Soil-Plant Transfer of Polychlorinated Dibenzo-p-dioxins and Dibenzofurans to Vegetables of the Cucumber Family (Cucurbitaceae)** Anke. Huelster , Jochen F. Mueller , Horst. Marschner *Environ. Sci. Technol.*, 1994, 28 (6), pp 1110–1115 **DOI:** 10.1021/es00055a021 Publication Date: June 1994 (Article: Indicates that dioxin is mobilized in soils as the result of plant activity. Given that there will only be a 12 inch cap over dioxin contaminated soils and the cap will have vegetative cover, the vegetative cover will absorb dioxin and bring it to the surface.)
- 2. Sorption of 2,3,7,8-tetrachlorodibenzo-p-dioxin to soils from water/methanol mixtures** Richard W. Walters , Annette. Guiseppi-Elie *Environ. Sci. Technol.*, 1988, 22 (7), pp 819–825 **DOI:** 10.1021/es00172a012 Publication Date: July 1988
- 3. Study by U.S. Dept. of Agriculture indicated that dioxin is only immobile in soils devoid of other organic material. If any organic co-solvents, as are present at the Pole Plant, are in the soil, mobility will occur.**
- 4. SUBSTANTIAL MIGRATION OF DIOXINS IN AGROCHEMICAL FORMULATIONS**, Grant, Sharon, Mortimer, Munro, Stevenson, Gavin, Malcolm, Don and Gaus, Caroline, The University of Queensland (National Research Centre for Environmental Toxicology (EnTox)), 39 *However, the presence of co-contaminants can act as transport facilitators for otherwise low mobility organic compounds (LMOCs) These results highlight that the paradigm of LMOCs being non mobile in soils should be considered carefully together with application specific and environmental factors which may have the ability to considerably change the predicted environmental fate of these chemicals.* (This article supports the above mentioned study by the U.S. Department of Agriculture that if, as we find at the Pole Plant, co-contaminates are present, dioxin does become mobile in soil. The point is that since the remedy for the Pole Plant was changed from one of active treatment to containment, co-contaminants that will make dioxin mobile in soil will be present.
- 5. Assessment of Dioxin Contamination at Sawmill Sites: A Report to the Ministry for the Environment by Tonkin & Taylor Ltd and SPHERE, Prepared for the New Zealand Ministry for the Environment**
October 2008 (conclusions are similar to the one's I included in my earlier email to you today, i.e. that dioxin is mobile in both soil and water.

Also, data presented by the MDEQ at the Tuesday, October 29 meeting indicated that dioxin is present in the recovery trenches at the Pole Plant. If dioxin isn't mobile in soil

at the Pole Plant, how did the dioxin get in the recovery trenches? Another point that Ian made: MDEQ is in charge of the cleanup in Missoula of the White Pine Sash site. This site was a wood treatment facility similar to Montana Pole. The MDEQ acknowledges at this site that dioxin can be mobile in soils. Why not acknowledge the same at Montana Pole? Finally, the dioxin levels that we are now seeing in groundwater at the Montana Pole Plant were not supposed to have been reached until 200,000 years from now according to MDEQ. Why, if dioxin is not mobile, are we seeing dioxin now that we should not have seen for 200,000 years?

Summary of my position:

1. The bottom line is that the dioxins, Pcps, Pahs and furans found at the site are highly toxic and carcinogenic.

Dioxin poses a serious threat to both human health and the environment. There are **no** safe levels of exposure to dioxin. (EPA) In fact, dioxin has been referred to as the “most toxic chemical known.” (*Hazardous Waste in America*, Epstein, Brown and Pope) Lethal effects of dioxin can be seen at very low levels—a millionth of a gram can kill lab animals. Dioxin was the toxic found in Agent Orange and at New York’s Love Canal. Dioxin causes serious cancerous and non-cancerous human health effects. (World Health Organization) Dioxin can produce multiple types of cancer. Non-cancerous health effects include type 2 diabetes, impaired immune system, ischemic heart disease, endometriosis, decreased fertility, inability to carry pregnancies to term, birth defects and learning disabilities. According to the National Institute of Environmental Health Sciences, the “dangers of dioxin last for decades after initial exposure.” Just dealing with contaminant level statistics can mask the danger posed by these contaminants.

2. These toxics will largely remain on site to pose a perpetual threat to human health and the environment. The site will never be cleaned up.

3. Even the data presented at the October 29th meeting shows that these toxics have been released. Perhaps these toxics have not been released in large quantities, perhaps they are not released all the time, but given the toxicity of the materials even relatively small releases are problematic. And given that the site will not be cleaned up, these releases will continue in perpetuity.

4. Based on the discussion of the DEQ 7 standards, it is obvious that the cleanup levels in the original Record of Decision for the Pole Plant are not protective. The problem is that the current cleanup is not meeting, in a significant number of cases, the DEQ 7 standards. Yet, the presentation on October 29th continually referred to meeting the outdated, non-protective EPA standards in the Record of Decision. Probably, the old Record of Decision will never be reopened.

5. The comparisons of the Pole Plant site to other sites presented at the October 29th meeting don't prove anything. Because, for example, the Pole Plant is comparable to other similar sites does not mean that the Butte cleanup is working to protect human health and the environment. We saw a gross misuse of comparisons.

6. The extensive use of caps for the Pole Plant is very problematic. Butte's history with capping toxic waste has not been good. Caps have been very problematic. The dioxins and other contaminants at the Pole Plant will all be just left in place, covered with only 12 inches of topsoil caps. Previous capping on the Butte Hill, which uses more soil than the level at the Pole Plant, has not worked well. We have a situation where the most toxic substances in Butte (dioxins, PCPs and furans) are to be covered with the least amount of soil. Caps, as we have seen in Butte, already are susceptible to failure by means of bio-irrigation, advection, dessication, erosion, weathering, bio-intrusion and stabilization problems. Caps also have significant construction, repair and maintenance problems.

7. Because the responsible parties for the cleanup cashed out, we better get it right now. The money for the cleanup is limited. My view is that a quality cleanup at Montana Pole has been sacrificed because of this cash out.

In short:

The Record of Decision for Montana Pole promised that the dioxins, furans, PCPs and PAHs found at the site (all are serious health threats) would be biologically treated and the site cleaned up. Contrary to the promise of cleanup, the MDEQ and EPA have reneged on this promise. MDEQ and EPA have largely abandoned treatment in favor of containment, leaving the threat in place. Now, cleanup will consist of leaving all of these toxics on site and “managing them” through institutional controls. The EPA itself says that the toxicity of dioxin exists for an extended period of time. Containment is contrary to the Superfund mandate that treatment is to be preferred over leaving waste in place. The shoddy cleanup at the Pole Plant perpetuates a public health threat that should and could have been fixed.

However, the current containment remedy is not working. Dioxin is still being released. The groundwater treatment system that was implemented at the Pole Plant site still allows for significant discharge of dioxin into Silver Bow Creek—100 times the current dioxin surface water standard. Such discharges will continue for decades to come. MDEQ’s own discharge study said that MDEQ’s planned cleanup approach would still allow dioxin to be discharged into Silver Bow Creek. MDEQ has ignored this problem and continues to implement a non-protective cleanup. Why was a sub-par cleanup approach selected? The threat to human health is particularly acute for those living near the Pole Plant.

So, while progress has been made, the rosy picture presented at the October 29th meeting does not give us a full picture of what is going on at the Pole Plant.

In addition to the citations I provided in this document, I would also ask that you review Ian’s submission of November 5, 2013 to the CTEC board giving his reactions to the conclusions presented at the October 29, 2013 meeting.

The following is the email from [REDACTED] of March 27, 2013 which I include as a reference point.

From: [REDACTED] <[REDACTED]@kirkenr.com>
To: [REDACTED] <[REDACTED]@wet-llc.com>; [REDACTED] <david_r_williams@blm.gov> [REDACTED] <[REDACTED]@gmail.com>; [REDACTED] <[REDACTED]@mtech.edu>; [REDACTED] <[REDACTED]@gmail.com>; [REDACTED] <[REDACTED]@gmail.com>; [REDACTED] <[REDACTED]@bresnan.net>; [REDACTED] <[REDACTED]@montana.com>; [REDACTED] <[REDACTED]@mtech.edu>; [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@hotmail.com>; [REDACTED] <[REDACTED]@mse-ta.com" <[REDACTED]@mse-ta.com>
Sent: Wednesday, March 27, 2013 9:18 AM
Subject: MT Pole

CTEC members-

I thought I would summarize for you the important points from the Montana Pole update at the meeting the other night.

1. The groundwater treatment system discharges dioxin into Silver Creek at 100 times the current very low surface water standard. This is expected to continue for decades under the current plan. It needs to be shown that this will not impact the health of aquatic life, fish, or people who eat them.

2. The Five Year Review from 2011 included three action items that the agencies would summarize for the layperson and distribute to the public the review findings, air monitoring health risks, and that they sampled soil where the wind-break trees died. This was to be an important response to citizens' comments and still needs to happen.

[REDACTED]

Therefore, the only protection from the dioxin in the soils at Montana Pole Plant will be the caps placed over the soil. However, storm water runoff, which continues to be an unremediated problem, compromises the integrity of the soil caps. After all there will only be a few inches of cap to protect the public.

The so-called cleanup of the Montana Pole Plant has been in many important respects a failure. Currently, the Montana Pole Plant is undergoing another Five Year Review where the EPA and MDEQ will evaluate their own work. MDEQ has not even solicited public comment on the Five Year Review. In an ad in local newspapers, MDEQ said simply: "If you would like to learn more about the Montana Pole and Treating plant Superfund site, please visit the DEQ website." This ad did not encourage the public to comment.

Any sound decision making system has a built in evaluation mechanism whereby, after implementation, decisions can be assessed as to effectiveness in meeting the goals of the decision. Superfund decisions undergo periodic, every five years, reviews that are supposed to assess whether or not the remedy selected by EPA is protecting human health and the environment. These reviews are called "Five-Year Reviews." Currently, the Montana Pole Plant is undergoing such a review. However, the review is being conducted by the very people that are also implementing the remedy—hardly a good recipe for an evaluation process. In fact, they have gone so far as to interview each other as part of the evaluation process.

What is needed is for those evaluating the Montana Pole Plant remedy to not be the same people who are implementing the remedy. I make no accusations of wrongdoing. I am simply saying that evaluation and implementation should be separate. Even without realizing it, we may be biased in favor of our own work. There is also a question of public confidence in the outcome of the review. Would the public have more confidence in a review done by independent experts or in a review done by those who implement the remedy?

An independent evaluation provides independent perspective, judgement and feedback. There is a tendency for people to praise their own work. How realistic is it for the public to expect that MDEQ will criticize its own work? We all have a tendency to be biased in our own favor.

An independent review provides a level of certainty and corroboration missing from a purely internal review. An independent review maintains the integrity of the process. An independent review is transparent and fair.

What I am asking is that the current Five Year Review of Montana Pole Plant be subjected to an independent peer review by qualified experts who are not part of the implementation process. MDEQ should not evaluate its own work. This is standard procedure in the scientific and academic community. Subjecting one's work to independent peer review is standard practice for the reasons mentioned above. The people doing the implementing of the remedy at Montana Pole are, I am sure, fine people. However, they should not be tasked with the impossible burden of evaluating their own work.

Consider the benefits of an independent peer review: According to the U.S. Department of Energy a *"peer review is a documented, critical review performed by peers [defined in the USNRC report as "a person having technical expertise in the subject matter to be reviewed (or a subset of the subject matter to be reviewed) to a degree at least equivalent to that needed for the original work"] who are independent of the work being reviewed. The peer's independence from the work being reviewed means that the peer, a) was not involved as a participant, supervisor, technical reviewer, or advisor in the work being reviewed, and b) to the extent practical, has sufficient freedom from funding considerations to assure the work is impartially reviewed.*

A peer review is an in-depth critique of assumptions, calculations, extrapolations, alternate interpretations, methodology, and acceptance criteria employed, and of conclusions drawn in the original work. Peer reviews confirm the adequacy of the work.

What confidence can the public have in this Five Year Review?

In short:

1. Dioxin and other major contaminants are present at the Montana Pole Plant. EPA and the Montana Department of Environmental Quality have said so.
2. The Montana Pole Plant was listed as a Superfund site because it was determined by EPA that these toxics posed a serious risk to human health and the environment.
3. Dioxin will remain on site at the Pole Plant, covered by a thin topsoil cover, after the cleanup is completed. Just read the statements to that effect from MDEQ.
4. These thin caps have proven to fail regularly in the rest of Butte.
5. Storm water runoff regularly flows through the Pole Plant and can wash toxics into Silver Bow Creek.
6. Given the thin cover and the fact that dioxin is left on site, how can MDEQ certify that that site is safe for further future use?

7. Before the site can be deemed remediated and before Silver Bow Creek can be restored, dioxin and other associated toxics at the Montana Pole site must be REMOVED and destroyed.

After the so called cleanup is completed, deadly dioxin will remain in the soils at the Montana Pole Plant. The only protection that the public will have from this deadly dioxin will be a relatively shallow soil cap. Soil caps have not worked well in Butte. Please consider the following:

Caps are not Permanently Protective of Human Health and the Environment.

Problems with caps:

14. Metals can be remobilized through bio-irrigation. (Dueri, Sibylle, et. al., University of Laval, Quebec, "Modeling the Transport of Heavy Metals through a Capping-Layer: The case Study of the Flood Sediments Deposited in the Saguenay Fjord, Quebec.")
15. The long term efficacy of caps can be compromised by advection "related to consolidation, diffusion, chemical reactions, and the effect of . . . burrowing activity." (*Ibid.*)
16. Desiccation can cause cracking of the cap cover. (David Daniel, Professor of Civil Engineering, University of Texas, *Geotechnical Practice for Waste Disposal*)
17. The freeze-thaw cycle can produce changes in the structure and fabric of the cover and a way that increases hydraulic conductivity. (*Ibid.*)
18. Caps are difficult to construct correctly. (*Ibid.*)
19. Caps are difficult to maintain and repair. (*Ibid.*)
20. Erosion is a serious problem. (Jack Caldwell, U.S. Department of Energy, *Principles and Practice of Waste Encapsulation.*)
21. Biointrusion can compromise the effectiveness of the cap. (*Ibid.*)
22. Differential settlement of the cap can cause cracking. (Oweis and Khera, New Jersey Institute of Technology, *Geotechnology of Waste Management.*)
23. Caps require regular and often expensive repair. (*Ibid.*)
24. Stabilization of the cap is a problem. (*Ibid.*)
25. Caps present long-term subsidence and settlement issues. (*Ibid.*)
26. Because of their susceptibility to "weathering, cracking and subsidence" caps have limited long term utility. "Wind, rain, and generalized erosion over time can severely damage even a well-designed . . . cover." (U.S. Department of Energy, Office of Environmental Management, "Remediation Technology Descriptions: Containment.") See also: Merritt, Frederick (ed.) *Standard Handbook for Civil Engineers*, McGraw-Hill, New York.

The extensive use of caps as a cleanup method for Montana Pole Plant would do nothing to reduce the toxicity and volume and mobility of contaminants. Caps do nothing to clean up a site. The extensive use of caps as a cleanup method for Montana Pole Plant would not provide a permanent remedy. The extensive use of caps as a cleanup method for Montana Pole Plant would violate the Superfund mandate for treatment over containment. In short, the extensive use of caps for the Montana Pole Plant would not be protective of human health and the environment.

In addition to caps, the remedy for the Montana Pole Plant depends on institutional controls to keep the public from contacting the deadly contaminants at the Plant.

The Public should be concerned about too great a Reliance on Institutional Controls.

Institutional controls per se do nothing to reduce the mobility, toxicity, or volume of contaminants. Institutional controls do nothing to clean up a site. The institutional controls being considered in the EPA's RI/FS for Priority Soils would seriously limit productive land uses and greatly compromise the property rights of owners to use their land as they determine. The extensive reliance on institutional controls is also contrary to the Superfund mandate of preference for treatment over restricted land use. Institutional controls do nothing to treat a site. The EPA's own document "Rules of Thumb for Superfund Remedy Selection" states that the law mandates a clear preference for treatment over all other approaches. "EPA expects to use treatment to address the principal threats posed by a site. . . ." [40 CFR 300.430(a)(1)(iii)(A)]. The above document also notes: "Institutional controls. . .generally shall not substitute for more active measures. . . ." (pp. 12-13)

The EPA itself has found significant problems with institutional controls at its other sites. In an article entitled "EPA, Think Tank Studies Show Superfund Land-use Controls Flawed, December 10, 2001" which summarizes "Superfund Report via Inside EPA.com" by Resources for the Future, we find these conclusions, ***reached by the EPA itself***, which due to their significance, I will quote at length:

"EPA and environmental think tank studies have shown that the federal and state governments' land-use restrictions at Superfund sites, known as institutional controls (IC), are seriously flawed, with an agency study showing the controls are not reliably implemented and the think tank report finding the controls are dramatically under-funded."

"During a November 27 land use control summit, sponsored by the International City/County Management Association (ICMA), EPA officials and the Environmental Law Institute (ELI), outlined numerous shortcomings they have found with EPA's IC monitoring and enforcement efforts nationwide. While EPA released the results of a study showing EPA has failed to ensure Superfund ICs are reliably implemented, and ELI study indicates that EPA's ICs are dramatically under-funded."

"Bruce Means, of EPA's Federal Facilities Restoration and Reuse Office, told attendees that preliminary studies show that half of the ICs implemented under Superfund records of decisions (ROD) were mischaracterized. During a study of RODs conducted during 1999 and 2000, the agency found that half of the ICs established under RODs were not implemented as the agency had planned."

"And Jay Pendergrass of ELI outlined the preliminary findings of ELI's study of state's IC programs, which showed that the programs are severely under-funded."

"In a draft version of the report, Pendergrass found that state environmental programs are underfunded and as a result the sites allocate very little time on IC implementation. The funding and staffing shortfall 'raises concerns about whether [ICs] are implemented as intended and [are] as protective as intended."

"An ICMA source agrees that EPA has serious problems with its IC program, saying that the agency has many RODs with vague or inconsistent references to such controls."
(pages 1-2)

The greater the cleanup of the Butte Priority Soils Operable Unit, the more the site can be used productively. The less cleanup of the BPSOU, the less the site can be used for residences and recreational uses. Given the EPA's admission that institutional controls have failed it in the past, it is amazing that the remedies listed in the RI/FS for Priority Soils call for such extensive use of institutional controls.

Other Problems with Institutional Controls:

- n. There is a tendency not to implement institutional controls as time passes. Frequently institutional control mandates are not carried to completion.
- o. The effectiveness of institutional controls usually depends upon the ability, personnel and resources of the local government to implement. Often local governments do not have the personnel or resources to devote to the implementation and monitoring of institutional controls. Given the national administration's proposed cutbacks in Superfund allocations, resources will be increasingly unavailable on the national level to monitor implementation and effectiveness of institutional controls. Certainly the financial capacity of Butte's local government to implement and monitor institutional controls is greatly limited. Nowhere does the EPA's comprehensively address the above issue.
- p. "Institutional controls rely heavily on humans to implement, oversee, and administer them. It is human nature to ignore tasks that no one else seems to care about or where the purpose is not readily apparent. Residual hazardous substances are a classic example of a problem that is not readily apparent." ("Protecting Public Health at Superfund Sites: Can Institutional Controls Meet the Challenge?" Environmental Law Institute, p. 2)
- q. Although EPA must review the remedy every five years, the frequency of this review process may be insufficient to detect the failure of institutional controls.
- r. The use of education as part of the institutional controls strategy is a substantial part of the EPA's approach to implementing institutional controls. Research of previous remedies under Superfund indicates that education programs fail to materialize.
- s. "In addition to the direct costs of implementing institutional controls, their use can impose substantial indirect costs on communities, property owners, prospective purchasers and developers by limiting the ways a site may be used. The burden of the restrictions on use of the site falls on the property owner and the community, with the owner reaping potentially lower profits from use of the property and the community receiving lower social benefits from the allowed uses than would have been possible if no restrictions existed." (ELI, *Ibid.*)
- t. Because the sites where institutional controls will be implemented will not be cleaned up and will present a continuing potential threat to human health, these sites will be off limits to development in perpetuity. It is difficult to see how the use of institutional controls meshes with the goals of the EPA's Superfund Redevelopment Initiative.
- u. It is impossible to determine future possible land uses for the site nor is it possible to predict unanticipated land uses. (See: "Linking Land Use and Superfund Cleanups: Uncharted Territory," by Probst, Hersh, Wernstedt and Mazurek, *Summary of Findings*, RFF, p. 1)
- v. "Institutional controls have more problems than just risk miscalculation. Breaches in the site because of future construction, or even animals may cause the control to fail. The lack of a required contingency plan, would not account for new remedies, new information, or failed institutional controls negatively impacts the effectiveness of the treatment. Institutional memory loss was well is an important factor. This memory loss occurs when a party decides to breach the original institutional control without its own knowledge. In fact, in the ICMA (International City/County Management Association) study, the majority of respondents (63%) said that breaches in the institutional controls on a site were highly or somewhat likely. Following up on that question, 30% of the respondents reported that no formal inspection schedule was set up to evaluate the site as require by law." (Erwin Tam, Environmental Science and Economics, UC Berkeley, "Analysis of Institutional Controls at California Superfund Sites.")
- w. "Concern has been expressed about the long-term viability of institutional controls as a remediation tool. For example, they may be forgotten; enforcement agencies may not effectively review properties or land users' actions; or land users simply may take their chances. Decision makers should weigh the full costs of such options, including capital costs, costs of long-term sampling and analysis, and costs of replacing equipment, as well as concerns about potential long-term risks associated with contaminants left in place, against the cost options that would remove the contaminants completely. Many local governments do not yet have the capacity and resources necessary to meet the challenges of long-term

stewardship.” (“Understanding the Role of Institutional Controls at Brownfields Sites: Major Concepts and Issues.”)

- x. Because institutional controls leave large amounts of contaminants in place, institutional controls will have to be perpetual. Who is to say what anticipated land uses come up for an institutionally controlled area? For example, fifty years after the record of decision for Butte Priority Soils is implemented, the contaminants will still be there threatening human health and the environment, but will the will be there to restrict land uses in order to prevent the release of contaminants. “Institutional controls ‘work’ only if they are complied with. And while this is true of any site remedy, institutional controls require monitoring and enforcement over long time periods.” (“Linking Land Use and Superfund Cleanups: Unchartered Territory, Probst, et al., Resources for the Future Center for Risk Management.) Will the will to enforce institutional controls exist fifty to a hundred years in the future?
- y. Legal, social and political pressures limit the effectiveness of institutional controls. (*Ibid.*)
- z. The long-term effectiveness of institutional controls is unknown. “There has, however, been little investigation of what happens at sites on the National Priorities List (NPL) when land use plays a prominent role in the remedy selection process. There also has been little analysis of what institutions are involved in making land use decisions and maintaining land use restrictions over time. It is unclear what legal mechanisms are most effective, what institutions will be responsible for enforcing institutional controls, and who’s going to pay for these additional responsibilities. We need to be able to answer these questions if land use-based remedies are to be protective over the long term.” (*Ibid.*)

“Planners of long-term disposal systems have long recognized the difficulty of maintaining institutional control over property. . . .” (Jack A. Caldwell and Charles C. Reith, *Principles and Practice of Waste Encapsulation*, 1993, p. 35)

Summary

Eternal vigilance is the price of liberty. Thomas Jefferson

Wouldn’t it be nice if citizens could trust government to do the right thing? Unfortunately, that doesn’t always happen. Anytime power is given to a government institution, that institution can escape popular accountability. Even when government is supposedly acting to promote and protect public health and safety, citizens need to be on their guard. The public interest is best promoted and protected by a vigilant public.

The Montana Pole Plant Superfund site in Butte usually flies below the public radar, except for those living near the site. Because surface water, groundwater, soils and sediments at the Pole Plant are contaminated with dioxins, the Pole Plant is, perhaps, the most dangerous of the Superfund sites in Butte. The Pole Plant cleanup by the Montana Department of Environmental Quality (MDEQ) leaves much to be desired.

Dioxin poses a serious threat to both human health and the environment. There are **no** safe levels of exposure to dioxin. (EPA) In fact, dioxin has been referred to as the “most toxic chemical known.” (*Hazardous Waste in America*, Epstein, Brown and Pope) Lethal effects of dioxin can be seen at very low levels—a millionth of a gram

can kill lab animals. Dioxin was the toxic found in Agent Orange and at New York's Love Canal. Dioxin causes serious cancerous and non-cancerous human health effects. (World Health Organization) Dioxin can produce multiple types of cancer. Non-cancerous health effects include type 2 diabetes, impaired immune system, ischemic heart disease, endometriosis, decreased fertility, inability to carry pregnancies to term, birth defects and learning disabilities. According to the National Institute of Environmental Health Sciences, the "dangers of dioxin last for decades after initial exposure."

The Record of Decision for Montana Pole promised that the dioxins, furans, PCPs and PAHs found at the site (all are serious health threats) would be biologically treated and the site cleaned up. Contrary to the promise of cleanup, the MDEQ and EPA have reneged on this promise. MDEQ and EPA have largely abandoned treatment in favor of containment, leaving the threat in place. Now, cleanup will consist of leaving all of these toxics on site and "managing them" through institutional controls. The EPA itself says that the toxicity of dioxin exists for an extended period of time. Containment is contrary to the Superfund mandate that treatment is to be preferred over leaving waste in place. The shoddy cleanup at the Pole Plant perpetuates a public health threat that should and could have been fixed.

However, the current containment remedy is not working. Dioxin is still being released. The groundwater treatment system that was implemented at the Pole Plant site still allows for significant discharge of dioxin into Silver Bow Creek—100 times the current dioxin surface water standard. Such discharges will continue for decades to come. MDEQ's own discharge study said that MDEQ's planned cleanup approach would still allow dioxin to be discharged into Silver Bow Creek. MDEQ has ignored this problem and continues to implement a non-protective cleanup. Why was a sub-par cleanup approach selected? The threat to human health is particularly acute for those living near the Pole Plant. Local residents have had to endure not only a failed cleanup but tremendous odor problems caused by the MDEQ's waste in place remedy.

Citizens have a right to know if and why government is not doing what it said it would do to protect human health and the environment. Agency decisions are binding.

The Pole Plant cleanup, again contrary to what was promised regarding community involvement, has failed to provide the public with timely information about the problems with the cleanup. The lack of any coordinated or effective program for citizen involvement means that citizens are prevented from holding government accountable and influencing government cleanup activities. The lack of transparency by the MDEQ and EPA means that citizens are left to "hope" that government does the right thing.

The public deserves answers to the following questions: (1) Why is the Pole Plant still out of compliance with emission standards for dioxin? And (2) Why hasn't the Pole Plant been cleaned up? After all, the public's safety is the highest law. (Roman law)

EMAIL H

From: [REDACTED] <[REDACTED]@yahoo.com>

Sent: Thursday, February 27, 2020 11:43 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@yahoo.com>

Subject: [EXTERNAL] Additional Public Comment--Montana Pole Plant Comment Period

Dioxin Caps—Concerns/Questions about the Proposed Caps and Area of Restricted Use at Montana Pole Plant

Submitted by: [REDACTED]

Dioxin contaminated soils will be left on-site at Montana Pole.

I wish to specifically address dioxin and the Montana Pole Plant. I am deeply concerned that dioxin at the Montana Pole Plant still presents a significant, unremediated threat to human health and the environment. I am deeply concerned about the permanence and protectiveness of the proposed caps for Montana Pole. Until this problem is corrected, Silver Bow Creek cannot be fully restored and talk of future land use at the site is premature.

There are no safe levels of exposure to dioxin. An EPA report in 2012 concluded that, after reviewing mounds of evidence, there are potentially serious health effects at ultra-low levels of exposure to dioxin. Other scientific studies have linked dioxins to cancer, disrupted hormones, reproductive damage such as reduced sperm counts, neurological effects in children and adults, immune system changes and skin disorders. (EPA, Environmental Health News) Studies have shown serious health effects at parts per trillion exposure to dioxin. No wonder dioxin is considered to be one of the most toxic substances known to human beings.

The EPA lists the following as health risks associated with dioxin.

Dioxins are highly toxic and can cause cancer, reproductive and developmental problems, damage to the immune system, and can interfere with hormones.

Given that there are no safe levels of dioxin exposure, given that dioxins attack numerous human organs, given that dioxins persist over time because of their chemical stability and tendency to accumulate in the body's fatty tissue (The WHO estimates that the half-life in the body of dioxin is estimated to be 7 to 11 years.), given the fact that people are already exposed to dioxin and their toxic burden should not be increased and given the highly toxic nature of the dioxins (that cause problems of the reproductive and developmental systems, damage to the immune system and are a potent carcinogen) that will remain in the area of restricted use at the Montana Pole Plant, my concern is whether or not the capping that will be done will be adequate to protect public health and the environment. To that end, I have the following questions/concerns:

1. What design, construction and operation requirements will have to be met for the caps?
2. Will protection such as that provided by an active sorbent such as coke or activated carbon be provided? (*With clay and AC treatments, bioaccumulation and leakage of dioxins was 67-91% lower than at the uncapped reference fields.* For example, without activated carbon, cap efficiencies drop by 46%. *The use of AC decreased both the bioavailability of dioxins present below the cap and the bioaccumulation and leakage of dioxins entering the cap after placement.* "Field Experiment on Thin-Layer Capping in Ornefjorden and Eidangerfjorden, Telemark: Functional Response and Bioavailability of Dioxins, 2009-2011," Schanning, M.T. and I Allan. Norwegian Institute for Water Research, REPORT SNOP 6285-2012, 92 pp, 2012)
3. Could zeolite be used as the cap?

4. Will the soil be treated with cationic surfactants prior to capping?
5. How will the proposed capping of the restricted area at Montana Pole Plant be congruent with the provisions of 40 CFR 300.430?
6. How will the proposed capping of the restricted area at Montana Pole Plant be congruent with the provisions of 55 FR 8703, March 9, 1990?
7. How will the proposed capping of the restricted area at Montana Pole Plant be congruent with the provisions of 63 FR at 28621m May 26, 1998?
8. How will RCRA LDRs apply to the proposed capping of the restricted area?
9. How will the proposed capping of the restricted area at Montana Pole Plant be congruent with the provisions of 40 CFR Part 268?
10. How will the proposed capping of the restricted area at Montana Pole Plant be congruent with the provisions of 40 CFR 264?
11. What treatment will be provided after the site is capped?
12. What institutional controls will be mandated?
13. How will stormwater runoff over the restricted area be controlled?
14. What specific in-situ treatment modalities will be used?
15. To what extent will caps used be impermeable?
16. What will be done regarding the power and sewage lines that run under the plant?

Using capping as the Primary Method of Protection for Dioxin Contaminated Soils at the Pole Plant is very Problematic

Caps are not Permanently Protective of Human Health and the Environment.

27. Dioxin can be remobilized through bio-irrigation. (Dueri, Sibylle, et. al., University of Laval, Quebec, "Modeling the Transport of Heavy Metals through a Capping-Layer: The case Study of the Flood Sediments Deposited in the Saguenay Fjord, Quebec.")
28. The long term efficacy of caps can be compromised by advection "related to consolidation, diffusion, chemical reactions, and the effect of . . . burrowing activity." (*Ibid.*)
29. Desiccation can cause cracking of the cap cover. (David Daniel, Professor of Civil Engineering, University of Texas, *Geotechnical Practice for Waste Disposal*)
30. The freeze-thaw cycle can produce changes in the structure and fabric of the cover and a way that increases hydraulic conductivity. (*Ibid.*)
31. Caps are difficult to construct correctly. (*Ibid.*)
32. Caps are difficult to maintain and repair. (*Ibid.*)
33. Erosion is a serious problem. (Jack Caldwell, U.S. Department of Energy, *Principles and Practice of Waste Encapsulation.*)
34. Biointrusion can compromise the effectiveness of the cap. (*Ibid.*)
35. Differential settlement of the cap can cause cracking. (Oweis and Khera, New Jersey Institute of Technology, *Geotechnology of Waste Management.*)
36. Caps require regular and often expensive repair. (*Ibid.*)
37. Stabilization of the cap is a problem. (*Ibid.*)
38. Caps present long-term subsidence and settlement issues. (*Ibid.*)
39. Because of their susceptibility to "weathering, cracking and subsidence" caps have limited long term utility. "Wind, rain, and generalized erosion over time can severely damage even a well-designed . . . cover." (U.S. Department of Energy, Office of Environmental Management, "Remediation Technology Descriptions: Containment.") See also: Merritt, Frederick (ed.) *Standard Handbook for Civil Engineers*, McGraw-Hill, New York.

The extensive use of caps as a cleanup method for dioxin contaminated soils at the Montana Pole Plant would do nothing to reduce the toxicity and volume and mobility of dioxin. Caps do nothing to clean up a site. The extensive use of caps as a cleanup method for dioxin contaminated soils at Montana Pole Plant would not provide a permanent remedy. Research clearly indicates that caps may actually make dioxin more bioavailable. The extensive use of caps as a cleanup method for dioxin contaminated soils at Montana Pole would violate the Superfund mandate for treatment over containment. In short, the extensive use of caps for the dioxin contaminated soil would not be protective of human health and the environment.

Problematic Nature of Phytostabilization.

(The dioxin contaminated soil caps will use plants for stabilization and to maintain the integrity of the caps. Plant cover will be a major part of the remediation picture advocated for dioxin contaminated soils. The quality of the vegetation on the caps will directly determine the protective efficacy of the caps. So far vegetative cover for caps in Butte has been somewhat spotty.)

These following comments are meant to show the very problematic nature of phytostabilization, as advocated for the remediation of dioxin contaminated soils at Montana Pole Plant.

1. At a site in Dearing, Kansas that contained contaminants similar to those found at the Montana Pole Plant, only 50% of the plants survived after three years. Of course, those that died recontaminated. A site in Whitewood Creek, South Dakota had only a five percent survival rate with contaminants similar to those founding at the Montana Pole Plant area. (Schnoor, J. I. "Phytoremediation," *Technology Overview Report, Ground Water Remediation Technologies Analysis Center*, Series E, Vol, 1), October 1997.) Existing caps on the Butte Hill have had similar problems with dying vegetation, most lasting only a season.
2. There is great concern over the permanence of phytostabilized dioxin. ("Clean Tailing Reclamation: Tailing Reprocessing for Sulfide Removal and Vegetation Establishment," S.R. Jennings and J. Krueger.)
3. Phytosabilization techniques do not adequately take into account plant geochemistry. Failure to do so may actually produce a situation where plants increase the leaching of dioxin. Schwab, A.P., et. al. Kansas State University, "Fate and Transport of Heavy Metals and Radionuclides in Soil: The Impacts of Vegetation." The Great Plains/Rocky Mountain Hazardous substance Research Center.)
4. The long-term effectiveness of phytostabilization has not been established in the field. Some field studies show "that some plant species with good greenhouse development, but lower enzymatic activities recorded in their rhizosphere area, were not stable in time and perished after 1 year in the field." (Petrisor, Ioana, et. al, University of Southern California, "Global Enzymatic Activities—Potential Tools in Assessment of Phytostabilization Strategies." See also: Brown, Kathryn, "The Green Clean," *BioScience*, Volume 45, No. 9, October 1995)
5. Droughts or floods can destroy plants. (See: Brown, *Ibid.*)
6. Regulatory Issues: "As of now phytoremediation is too new to be approved by regulatory agencies. Can it clean up the site below action levels? On what scale? Does it create any toxic intermediate or products? Is it cost effect as alternative methods? Does the public accept the technology?" (Zynda, Todd, Michigan State University, "Phytoremediation," Hazardous Substances Research Center. Michigan State University)

The use of phytostabilization should be minimal compared to removal of contaminated waste to a safe repository. I hope that Dr. Robert Pal of Montana Tech will be involved in the design and implementation of phytostabilization at the Plant.

The Montana Pole Plant Cleanup Relies too Heavily on Institutional Controls that are an Inherently Flawed Approach to Superfund Cleanups.

Superfund's goal is to clean up hazardous waste sites that pose a threat to human health and the environment. Superfund cleanups should provide a permanent remedy that, in part, reduces the toxicity, mobility, and volume of contaminants. Because Superfund has a strong preference for treatment, the use of institutional controls should normally not be a substitute for "more active measures (e.g. treatment and/or containment of source materials) as the sole remedy. . . ." (40 CFR 300.430(a)(1)(iii)(D). OSWER Directive 9355.0-69, EPA 540-R-97-013 makes essentially this same point that the use of institutional controls should be a remedy of last resort.

To the extent that contamination at a site is really cleaned up, the necessity for institutional controls is minimized. To the extent that institutional controls are used at a site to put waste off-limits, the extent of contamination cleanup is minimized. It is important to remember that the impetus for Superfund in the first place was a failure of institutional controls to prevent the contamination problems and resultant health effects at Love Canal where the institutional controls were not followed. Risk is a function of both toxicity of the materials on site and the degree of exposure to the hazardous waste. (*Effects of Future Land Use Assumptions on Environmental Restoration Decision Making*, DOE, Office of Environmental Policy and Assistance, RCRA/CERCLA Information Brief, DOE/EH-413/9810, July 1998, p.1) Institutional controls depend on limiting exposure to toxic materials and do nothing to lessen the toxicity of these materials. After institutional controls are implemented, the toxic materials that originally triggered the Superfund cleanup are still on site to threaten human health and the environment.

MDEQ's solution to the problem of dioxin contaminated soils at Montana Pole Plant should be concerned about treating dioxin and, if treatment of the waste is technically impossible, removing the hazardous waste to a repository where the waste will no longer threaten human health and the environment. "Our obligation is to free subsequent generations of the responsibility for care taking our hazardous residues, not to saddle them with housekeeping chores which, if neglected, will result in the re-pollution of the environment that we worked so hard to clean." (Jack A. Caldwell and Charles C. Reith, *Principles and Practice of Waste Encapsulation*. Boca Raton: Lewis Publishing Co., 1993, p. 35.) Dioxin that is institutionally controlled is still a permanent threat to human health and the environment.

The cleaner a site is after remediation, the greater the potential land uses for that site. The more contamination left after remediation, the less the potential land uses are for the site. "Citizens have pushed for the highest cleanup standards, arguing that an unrestricted use would allow a wider range of future development at the site." (Wernstedt, et. al., *Basing Superfund Cleanups on Future Land Uses: Promising Remedy or Dubious Nostrum?*, Resources for the Future, Discussion Paper 98-03, October 1997, p. 17) The institutional controls being supported for Montana Pole Plant by MDEQ would seriously limit productive land uses. The extensive reliance on institutional controls is also contrary to the Superfund mandate of preference for treatment and cleanup over institutional controls that restrict land use in perpetuity. If the goal is to encourage productive land uses after Superfund cleanup, a clean site affords the most encouragement. If the goal is to protect human health and the environment, dioxin must be treated and/or removed.

The thesis of my comments regarding institutional controls is that the use of institutional controls for the Montana Pole Plant site should be minimal. Instead of extensive use of institutional controls to deal with the dioxin contaminants, dioxin at the Montana Pole Plant should, to the greatest technically feasible extent, be removed to a safe repository and treated there using appropriate innovative technologies.

Consider the following detailed argument about the inadequacy of institutional controls.

Institutional Controls are not Effective

A. The EPA itself has found significant problems with the effectiveness of institutional controls. For example, in an article entitled “EPA, Think Tank Studies Show Superfund Land-use Controls Flawed, December 10, 2001” which summarizes “Superfund Report via Inside EPA.com” by Resources for the Future, we find the following conclusions:

1. Institutional Controls are not reliably implemented. The EPA study found that over half of the institutional controls implemented under EPA issued records of decision are mischaracterized and that half of the institutional controls were not implemented according to EPA plans.
2. Institutional Controls are dramatically underfunded.
3. Monitoring of institutional controls is poor. Another study of California Superfund sites entitled: “Analysis of Institutional Controls at California Superfund Sites” by Erwin Tam of the University of California—Berkeley found that 30% of the sites had no inspection schedule as required by law and in 63% of the cases it was felt that compromise of the institutionally controlled site was likely.
4. Enforcement of institutional controls is poor.
5. ROD’s tend to have “vague or inconsistent references” to institutional controls.

In a study done by English, et. al. of the University of Tennessee entitled *Institutional Controls at Superfund Sites*, (July 1997. Hereinafter cited as *Institutional Controls at Superfund Sites*.), which was funded in part by EPA; the EPA’s remedial project managers admit the above listed problems (1-5) with institutional controls. The report concludes: “Perhaps most importantly, the results of this study point to a fairly strong sense of unease on the part of some RPMs with the efficacy of institutional controls. This finding is consistent with discussions in the literature on the efficacy of institutional controls.” (p.67) No wonder noted engineers Jack A Caldwell and Charles C. Reith stated in their book *Principles and Practice of Waste Encapsulation*, that “Planners of long-term disposal systems have long recognized the difficulty of maintaining institutional control over property. . . .” (p. 35)

B. “To the extent that responsibility for selecting and maintaining the long-term effectiveness of the remedy will become contingent on the intent and actions of a more diffuse set of institutions—local government, private property laws, current and future property owners, land recordation offices, the courts—the ultimate effectiveness of a remedy to protect human health and the environment will become increasingly difficult to assess.” (Hersh, et. al., *Linking Land Use and Superfund Cleanups: Uncharted Territory*, Center for Risk Management, 1997, p.49. Hereinafter cited as: *Linking Land Use*.) If institutional controls become the prime remedy for the dioxin contaminated soil at the Montana Pole Plant, the community will have to live with these controls, effective or not, in perpetuity.

C. The success of institutional controls will depend on changing the way people behave which is very difficult.

Managing human behavior is an extraordinarily difficult task. None of the institutional controls in use, or under consideration for future use, is foolproof. None can reduce to zero the risk of human or environmental exposure to hazardous substances left in place at a site. Nor is there a universal, all-purpose institutional control appropriate for all sites.

(Environmental Law Institute, *Protecting Public Health at Superfund Sites: Can Institutional Controls Meet the Challenge*, 1999, p. 13. Hereinafter cited as *Protecting Public Health*.)

The risk of human exposure is considerably less if the toxics are treated to make them non-toxic or if they are removed to a repository where the public cannot come in contact with them.

D. The relationship between land use and toxic exposure is not well understood and can have a great deal of variation.

Institutional Controls have Inherent Limitations

A. Institutional controls do nothing to reduce the toxicity or volume of contaminants. Institutional controls, per se, are not that effective in reducing mobility of toxics off-site. To be protective of human health and the environment, institutional controls would have to last as long as the toxics last. “Substances such as lead, mercury, arsenic, and cadmium will not degrade at all and will remain potentially hazardous unless removed or treated. In order to effectively protect against exposure to such long-lived risks, institutional controls would need to last essentially for as long as humans are expected to live on the planet.”

(*Protecting Public Health*, p. 13.) No institutional control has this needed level of permanence. If institutional controls are used instead of removal and/or treatment, these controls will have to work in perpetuity. Remember, toxic heavy metals such as those found at the BPSOU do not lose their toxicity over time. Yet, institutional controls are predicated on the designated land use of a sight existing in perpetuity—a flawed assumption. Land use changes are the most frequent changes in a locality.

B. Institutional controls also increase the likelihood that people will unknowingly be exposed to hazardous materials. Leaving contamination on site will always pose a threat of exposure if the institutional control fails. Predicting the long-term efficacy of an institutional control system is very problematic.

C. As we saw with regard to lead exposure, very often, as time passes, it is determined that the contamination in place is more dangerous to human health and/or the environment than originally thought. In such a situation, the in-place institutional controls may not be sufficiently protective of human health and the environment. “Questions then arise about who should be responsible for additional controls or remediation, and about whether residual contaminants should be allowed only if their risks and methods of containment are well understood.” (*Institutional Controls at Superfund Sites*, p. 36.) It is critical that we get the most protective remedy the first time around.

D. Since the implementation of institutional controls depends on people, human error or neglect is a constant problem. After a remedy is selected, the degree of interest in the implementation of the remedy does not match the degree of interest shown during the remedy selection process. “Residual hazardous substances are a classic example of a problem that is not readily apparent, and the tasks associated with implementing institutional controls are unlikely to be the focus of widespread public attention in many cases. Thus, decision makers should plan for a relatively high probability that the person charged with the responsibility to implement an institutional control will fail to do so because that task is not a high priority for that person or because it is a task without a specific deadline and can therefore be postponed indefinitely.” (*Protecting Public Health*, p. 103) The efficacy of an institutional control depends on human judgment and “the judgment of any individual may be questionable in a specific situation and a poor judgment about implementing institutional controls could cause people to be exposed to hazardous substances.” (*Protecting Public Health*, p. 105)

The Meaning and Understanding of Institutional Controls is Problematic.

A. What are the institutions that will be charged with controlling the toxics? How will these institutions coordinate their activities? Who will devise these institutional controls? Who will have enforcement responsibility? How will these controls be enforced?

What is meant by controls? To what extent will the nature of these controls be the result of political processes rather than good protective environmental and scientific technology? Who will monitor the

institutional controls? How often will the controls be monitored? How will they be monitored? All of these questions must be satisfactorily answered before the public can have any confidence in the protectiveness of the controls. Yet, in far too many cases where EPA has extensively utilized institutional controls, these questions have never been answered. Nor is there any consensus as to how they should be answered.

B. “When we admit societal values, power, political leverage, and notions of rights and duties into the picture, it becomes difficult to see ‘controls’ as anything but contested, and hence problematic. For institutional controls are not stagnant features of a remedy but are made and unmade in the course of experience by regulatory statutes, by the acuity of government oversight, by negotiations at planning board meetings, by the attitudes of bankers, developers, and others involved in real estate, by the limitations of scientific understanding of the health risks posed by toxic chemicals, by the vast and evolving corpus of real property law, by public trust in government or the lack thereof, and, in a broader sense by the constellation of rights and responsibilities that inform a societal ethic.” (*Linking Land Use*, p. 52. See also: T. Beatley, *Ethical Land Use: Principles of Policy and Planning* (Baltimore, MD: Johns Hopkins Press, 1994 and R. Platt, *Land Use and Society: Geography, Law and Public Policy* (Washington, D.C.: Island Press, 1996)
Even if there were some agreement on the nature and role of institutional controls, that agreement would be fleeting.

Legal Issues Limit the Effectiveness of Institutional Controls

A. Another problem complicating the use of institutional controls are the courts. The courts can potentially play a significant role on land use decisions and land use decisions can be very litigious.

“Although the courts try not to make substantive zoning decisions, judicial attacks on local land use regulations are well documented in case law and in the planning literature and constitute yet another source of uncertainty to the effective working of institutional controls at Superfund sites. In view of the wide variation in the decisions of state and appellate courts concerning the limits of police power to regulate land use and the need for Constitutional protection for the individual, it is easy to envisage the possibility that an owner of a site that is encumbered with a use restriction may challenge and successfully invalidate an institutional control, such as a zoning restriction, on the grounds that the restriction will cause a severe burden and, as such, constitutes a taking of private property by the government.” (*Linking Land Use*, p. 64)

B. The NCP does not clearly specify the legal authority for institutional controls. Because there are no detailed statutory specifications of institutional controls, institutional controls are often left to the end of the remedy selection process where public input is minimal. Leaving them to the end is problematic in that: “If you leave institutional controls to the last and you can’t get them implemented, then you’re stuck. You’re at a dead end rather than the destination of the record of decision (ROD).” (Claudia Kerbawy, *op.cit.*, p. 53)

C. On a practical level, it is unclear who should monitor and enforce the institutional controls. RODs usually have little specificity regarding the implementation and monitoring of institutional controls. Often the specification of the nature and types of institutional controls is very general. Questions abound regarding what kind of monitoring will be performed, who will perform the monitoring, how and what type of enforcement will occur, what will be the frequency of the monitoring, and who is responsible for maintaining the protectiveness of the institutional control arrangements. The technical remedy is determined first and then institutional controls are developed to protect the remedy. Yet, it is often difficult to get acceptance by property owners or PRPs after the ROD is issued

D. Given that issues related to institutional land use/property control are not based in federal law but are based in state property laws or the local police power, federal control of institutional controls on the local level is very limited. CERCLA provides EPA with oversight authority over institutional controls that are part of the ROD remedy but CERCLA provides no mechanisms to enforce that control. Every five years, EPA can amend a remedy when contaminants are left in place, but during that five-year period the supervision of institutional controls is with the local government. Much to compromise a remedy can happen in five years. Moreover, there are serious proposals in Congress to remove the five-year review process. Hence, federal supervision of institutional controls is very problematic and could disappear altogether.

E. It is very problematic whether an institutional control on a current owner of a particular property would bind subsequent owners of that property. “Can third parties (for example, community groups or the local government) enforce a restriction at a site if the property owner fails to comply with the control and the holder of the easement, for example, (EPA, a PRP, the state government, or a local government if signatory to the agreement) fails to act properly? (*Linking Land Use*, p. 57) In *Environmental Regulation of Real Property*, N. Robinson comments that institutional control covenants are very complicated and that “they often defeat the attempts of parties to write covenants which will be enforceable against successors.” (pp. 6-16) For example, the form of future property ownership must be similar to the existing type of property ownership for an institutional control restriction to continue in force. Once a property is sold to a new owner, monitoring of what the new owner does on the property is diffuse if it exists at all.

What happens in a commercial venture if the purchaser of the property goes bankrupt? Who is responsible for the institutional control restrictions on the property? Who will enforce these restrictions? State laws regulating the use property are Byzantine.

“The common law tradition of different types of ownership could limit long-term effectiveness of (institutional controls’) reliability if they fail to bind third parties to the agreements worked out in the consent decree, and the question of authority—who holds an easement and on what legal basis can the government or some other entity challenge noncompliance with the easement or deed restriction—is, again, open to interpretation. These issues suggest that proprietary controls, negotiated between PRP/site owners and government (federal, state, local) may be insufficient by themselves to effectively ensure the long-term safety of the public from residual contamination. Their reliability hinges on how carefully they are devised, the authority and willingness of the party holding the rights to use them, and the willingness of a property owner to comply.” (*Linking Land Use*, p. 58)

F. Multiple owners or multiple use of a site also compromise the ability of government to police institutional controls.

G. The “touch and concern” doctrine can limit the efficacy of real covenants in the institutional control process. “Equitable servitudes” also are limited in their effectiveness by the “touch and concern” requirement.

H. Liability under institutional controls is problematic.

“When institutional controls are created, it is important to determine who will be liable in the event they fail. Even if the EPA has entered into a consent decree at the time of the initial site remediation releasing PRPs from liability for residual contamination, questions remain about liability if the institutional controls are violated. For example: If the current property owners allow development that violates use restrictions, are they liable, are the original PRPs liable, or both? If people are harmed by such a violation, would they be able to sue the current property owners, the original PRPs or both?” (*Institutional Controls at Superfund Sites*, p. 34)

- I.** Another difficulty is that land use controls are “vulnerable to changing legal interpretations about the nature of property rights.” (Wernstedt, et. al., *Basing Superfund Cleanups on Future Land Uses: Promising Remedy of Dubious Nostrum?*, Resources for the Future, Discussion Paper 98-03, October 1997, p. 16) For example, if the courts expand the scope of takings decisions to increase the extent to which government regulations are viewed as a “taking” then the efficacy of institutional controls will be diminished.

Summary of the Problems with Institutional Controls

10. Institutional controls do not meet the Superfund mandate of really cleaning up a site. To clean up means to make free of contamination.
11. Institutional controls are not permanent remedies. Rather, institutional controls permanently leave pollutants in place.
12. Institutional controls do nothing to reduce the toxicity of the hazardous materials. Lead, arsenic, mercury, and cadmium don't naturally attenuate over time, but keep their toxicity indefinitely.
13. Institutional controls are designed, implemented and monitored poorly.
14. Institutional controls have inherent enforcement problems.
15. Institutional controls have severe legal problems that work against effective reduction of the threats to human health and the environment posed by toxic materials.
16. Institutional controls are ineffective.
17. Institutional controls for a Superfund site are usually the result of a defective process that limits public participation and which leads to a haphazard development of institutional controls for a particular site.
18. Institutional controls are poorly understood and poorly defined.

Institutional Controls Problems Summary

The use of institutional controls at the Montana Pole Plant site should not be a substitute for real, permanent cleanup. Institutional controls do nothing to clean up a site. Because institutional controls rely on the flawed premise that the way to prevent human exposure to toxic substances is to remove humans from the toxic substance by attempting to change human behavior patterns rather than by removing the substance from the humans which would allow citizens to pursue their activities without being threatened by toxics, the extensive use of institutional controls is bound to fail. Institutional controls also have significant design, development, implementation, monitoring and enforcement problems. Institutional controls are not effective. Legal problems abound with institutional controls. Institutional controls are not a permanent solution to the toxics problem. To the maximum extent possible, the contaminants found Montana Pole Plant site should either be treated on site or, if on-site treatment is not possible, be removed from the area to a safe repository where they can be treated.

EMAIL

From: [REDACTED] <[REDACTED]@yahoo.com>

Sent: Tuesday, March 3, 2020 5:15 AM

To: [REDACTED]; [REDACTED]

Cc: [REDACTED]

Subject: [EXTERNAL] Additional Public Comment--Odors at the Pole Plant

The following is submitted as public comment pursuant to the ESD public comment period for Montana Pole Plant.

[REDACTED]

Activity pursuant to the proposed ESD for Montana Pole Plant will probably recreate the odor problem of a number of years back. These odors were harmful to sensitive individuals in and of themselves and not just as indicators of underlying pollution. Extensive documentation in the literature exists that odors can in and of themselves be harmful to human health. Human health effects were certainly felt by sensitive residents near the Pole Plant in the past as a result of remediation activity at the Plant.

I would like to raise the following issues/concerns that I would like addressed pursuant to the public comment period for Montana Pole Plant:

1. Will the remediation activity pursuant to the ESD likely create an odor problem for nearby residents of the Montana Pole Plant?
2. If so, what steps will MDEQ take to mitigate this problem, hopefully before it becomes a threat to human health of sensitive individuals?
3. What steps will MDEQ take to inform residents that odors will again be an issue pursuant to the implementation of remediation as provided for in the ESD?
4. What assurances can MDEQ provide to area residents that MDEQ's mitigation efforts have worked elsewhere and will work at the Montana Pole Plant?

EMAIL J

From: [REDACTED] <[REDACTED]@yahoo.com>

Date: March 3, 2020 at 10:57:50 AM EST

To: "[REDACTED]" <[REDACTED]@mt.gov>, [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>, "[REDACTED]" <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment--Montana Pole Plant Public Comment Period

Submitted by:

[REDACTED]

Butte, Montana 59701

The Precautionary Principle and the Principal of Pollution Prevention, which are part of federal as well as Montana State law, mandate remediation **before** harm occurs.

CERCLA's purpose is to ameliorate or prevent actual or potential threats to human health and the environment emanating from toxic material or hazardous materials. Article II, section 3 of the *Montana Constitution* provides that "All persons are born free and have certain inalienable rights. They include the right to a clean and healthful environment..." and Article IX of the Montana State Constitution holds: "The State and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations." MDEQ's Mission is: "to protect, sustain, and improve a clean and healthful environment to benefit present and future generations."

Given that the Precautionary Principle and the Principle of Pollution Prevention are mandated by federal as well as Montana State law, these principles must be applied to the remedy for Montana Pole Plant.

Precautionary Principle and Principle of Pollution Prevention: Definition and Scope

The essence of the precautionary principle is that government should act before harm to human health and the environment occurs from the releases of toxic substances. The precautionary principle "dictates that indication of harm, rather than proof of harm, should be the trigger for action." (Sandra Steingraber, *Living Down Stream: An Ecologist Looks at Cancer and the Environment*, p. 270.) If there is a reasonable suspicion that harm to human health and the environment could occur from the release of a toxic substance, government should step in and fix the problem before it hurts people and the environment. The 1998 Wingspread Statement on the Precautionary Principle states: "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically." Former EPA director Christine Todd Whitman stated: "policymakers need to take a precautionary approach to environmental protection. . . . We must acknowledge that uncertainty is inherent in managing natural resources, recognize it is usually easier to prevent environmental damage than to repair it later, and shift the burden of proof away from those advocating protection toward those proposing an action that may be harmful." If there is a strong suspicion that something bad is going to happen, government has an obligation to stop it prior to its occurring. The precautionary principle is really grounded in old common sense sayings: "An ounce of prevention is worth a pound of cure." "Better safe than sorry." "A stitch in time saves nine." "Look before you leap."

The President's Council on Sustainable Development supports the precautionary principle. The Council declared: "Even in the face of scientific uncertainty, society should take reasonable actions to avert risks where the potential harm to human health or the environment is thought to be serious or irreparable." The American Public Health Association has passed a similar resolution concerning chemical exposure. (Resolution 9606)

The U.S. Court of Appeals for the District of Columbia Circuit upheld the EPA's use of the precautionary principle in *Ethyl Corp. v. U.S. Environmental Protection Agency* (541 F. 2d 1, 6 ELR 20267 (D.C. Cir.), cert denied, 426 U.S. 941 (1967) This was the case which supported the banning of leaded gasoline by the EPA. The banning of lead additives to gasoline was an example of the precautionary principle in action. "The U. S. Court of Appeals for the D.C. Circuit upheld the U.S. Environmental Protection Agency's decision to take a precautionary approach and ban lead anyway, even in the absence of scientific evidence adequate to demonstrate exactly what the risks from the lead were or what the benefits of removing it would be. As it turned out, banning leaded gasoline was the single most important contributor to the virtual elimination of lead from air and from most children's blood." (Charnley and Elliott, *Risk Versus Precaution: Environmental Law and Public Health Protection*, Environmental Law Institute, March 2002)

There is ample support for the precautionary principle from international organizations and treaties, to many of which the United States is a signatory, thereby creating a legal obligation. For example, the Rio Declaration from the 1992 United Nations Conference on Environment and Development, also known as Agenda 21, stated: "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." The United States signed and ratified the Rio Declaration.

The precautionary principle is also part of the following: Ozone Layer Protocol, Second North Sea Declaration, United Nations Environment Programme, Nordic Council's Conference Declaration of October 18, 1989, PARCOM Recommendation 89/1, Third North Sea Conference, Bergen Declaration on Sustainable Development, Second World Climate Conference, Bamako Convention on Transboundary Hazardous Waste into Africa, OECD Council Recommendation of January 1991, Maastricht Treaty on the European Union, Climate Change Conference, UNCED Text on Ocean Protection, and the Energy Charter Treaty.

Federal Cleanup Law Mandates the application of the Principle of Pollution Prevention and the Precautionary Principle

The Pollution Prevention Act of 1990 established as national policy the mandate that: "Pollution should be prevented or reduced at the source wherever feasible." According to the EPA, pollution prevention means "source reduction" which is defined in the Pollution Prevention Act as any type of action which: "reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment or disposal" and "reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants." Pollution Prevention and the Precautionary Principle are also a part of several other federal laws: CERCLA, Clean Water Act, Toxic Substances Control Act, NEPA, RCRA, EPCRA, and the Clean Air Act. For a more detailed discussion of the role of pollution prevention and the precautionary principle in federal environmental law see: *Advancing Environmental Justice through Pollution Prevention: A Report developed from the National Environmental Justice Advisory Council-A Federal Advisory Committee to the U.S. Environmental Protection Agency*, June 2003. As this report makes clear, there is an intimate relationship between environmental justice, pollution prevention, and the use of the precautionary principle, all of which are EPA policy mandates.

Montana Law Mandates the Application of the Principle of Pollution Prevention and the Precautionary Principle

In interpreting the meaning of Articles II and IX of the Montana Constitution, the Montana State Supreme Court in *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236) found that **Pollution Prevention** and the **Precautionary Principle** were part of the Montana Constitution's guarantee to citizens of a clean and healthy natural environment, i.e. these principles are part of Montana law. The Court found that "the right to a clean and healthful environment is a fundamental right. . . ." In analyzing the discussion and

debate at the 1972 Montana Constitutional Convention, the Court determined that it was the clear intent of the participants that the environmental rights guaranteed in Articles II and IX were interrelated and that these two Articles espoused the principles of pollution prevention and the precautionary principle. For example, the Court cites Delegate McNeil who said in discussing how Articles IX's subsections (1) and (3) were related: "It goes further than that and directs the Legislature to provide remedies to prevent degradation. **This is anticipatory.**" (*Emphasis supplied.*) It was also clear during the discussion and debate during the Montana Constitutional Convention that the delegates intended the environmental provisions of the Constitution to mandate an "improvement" of the natural environment. The Court stated: "In doing so, we conclude that the delegates' intention was to provide language and protections which are both anticipatory and preventative. The delegates did not intend to merely prohibit that degree of environmental degradation that can be conclusively linked to ill health or physical endangerment. Our constitution does not require that dead fish float on the surface of our state's rivers and streams before its farsighted environmental protections can be invoked...." The Montana Supreme Court's decision is an unambiguous and binding statement that the **Principles of Pollution Prevention and the Precautionary Principle/Rule** must direct the administration and implementation of ALL state laws, rules, and regulations.

The goal of Montana's pollution prevention program is to "prevent pollution before it occurs. Pollution prevention is the highest step of the waste reduction hierarchy and occurs prior to the other steps of recycling, treatment, or disposal." (MDEQ, *What is Pollution Prevention?*) **See also:** MCA 2003, 75-10-601; 75-1-602, 8 (b) (iii) and 75-1-103 (1) and (2) (a)

Black's Law Dictionary also provides guidance as to the meanings of the concepts articulated in the Montana Supreme Court case above quoted.

Black's defines **potential** as "Existing in possibility but not in act." **Threat** is defined as a "menace." **Imminent** is defined as: "Near at hand; mediate rather than immediate, close rather than touching, perilous." **Substantial** is defined as of "Importance." Certainly, dioxin left in place at the Montana Pole Plant site would present a potential threat and a substantial, imminent threat as defined in *Black's Law Dictionary*.

Given that MDEQ is the "lead" agency for Montana Pole and given the legal relationship mandated in CERCLA in regard to the relationship between state and federal regulatory protocols, rubrics and standards, the Montana requirement that the Precautionary Principle and the Principle of Pollution prevention inform and guide remediation decisions must be respected by EPA and MDEQ.

The point of Montana law and federal law is that it is better to prevent pollution before it harms public health and the environment rather than treat or mitigate the effect of pollutants after they are released. The medical motto: *Primum non nocere* (First, do no harm.) would apply to pollution prevention. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant consideration and remediation of contaminated dioxin **now** rather than waiting for these contaminants to be released and then trying to treat them later. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant removing as much of the dioxin as possible so as not to threaten future generations. Dioxin waste-in-place is a serious threat-in-place.

The Pollution Prevention Principle and the Precautionary Principle are in effect ARARs for Superfund Sites in Butte

In effect, the provisions of the Montana Supreme Court decision *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236 as well as the other citations listed above become ARARs which must be met for the Montana Pole Plant Operable Unit. This point is clearly articulated in: *United States v. Akzo Coating of America, Inc.* No. 88-CV-73784-DT (719 F. Supp. 571, 30 ERC 1361) (E.D. Mich. August 9, 1989) ARARs do not have to be numerical standards but can be found in the law of the state. The Akzo court found: "CERCLA envisions a substantial and meaningful role for the individual states in the development and selection of

remedial actions to be taken within their jurisdictions. CERCLA also accommodates the environmental standards and requirements of the state in which a site is located.” “Congress has not. . .displaced state regulation. . .” “CERCLA does not expressly preempt state law. . .” With specific regard to numerical standards that court found: “Although the state law does not contain specific numerical standards, it is, as the State contends, legally enforceable and of general applicability. The EPA’s own publication (EPA, *Superfund Program; Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements; Notice of Guidance*, 52 Fed. Reg 32495, 32498 (Aug. 27, 1987) recognizes that general requirements having no specific numerical standards to be enforceable ARARs. General State goals that are duly promulgated (such as a non-degradation law) have the same weight as explicit numerical standards. . . .” The Court cites numerous other cases to support its conclusion.

What are ARARS for Purposes of Butte Superfund Sites?

According to the *CERCLA/Superfund Orientation Manual* (EPA/542/R-92/005, October 1992), ARARs are defined as “Any standard, requirement, criterion, or limitation under a State environmental or facility-siting law. . . .” Certainly, a decision of the Montana State Supreme Court, given the doctrine of judicial review, would qualify as a requirement, standard, criterion or limitation.” This Montana Supreme Court decision is more stringent than any other federal court decision. So given that it is enforceable, has been promulgated and is more stringent than federal case law (See: *CERCLA/Superfund Orientation Manual*, p. XII-2 and XII-6), this decision is an ARAR. “CERCLA, Section 121(d)(2) requires compliance with applicable or relevant and appropriate state requirements when they are more stringent than federal rules and have been ‘promulgated’ at the state level. To be viewed as promulgated and serve as an ARAR at a Superfund site, a state requirement must be legally enforceable, based on specific enforcement provisions or the state’s general legal authority, and must be generally applicable, meaning that it applies to a broader universe than Superfund site.” (*RCRA, Superfund and EPCRA Hotline Training Module: Introduction to Applicable or Relevant and Appropriate Requirements*, (EPA540-R-020, OSWER9205.5-10A, June 1998, p. 19) Clearly the Precautionary Principle and the Principle of Pollution Prevention, as mandated by the Montana Supreme Court Decision *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236), as well as Montana state environmental policy as articulated in the MCA, are clearly ARARs for the Montana Pole Plant site. As we know, CERCLA does not contain its own cleanup standards but relies heavily on state ARARs. “Regulation codified in the NCP governs the identification of ARARs and require compliance with ARARs throughout the Superfund response process, including. . .removal actions.” (*RCRA, Superfund and EPCRA Hotline Training Module: Introduction to Applicable or Relevant and Appropriate Requirements*, (EPA540-R-020, OSWER9205.5-10A, June 1998, p. 1) Of course, as previously cited, ARARs do not have to be numerical or quantitative.

The point is that both Court precedents as well as EPA policy mandate the use of the precautionary principle as it applies to Superfund sites in Butte. The Precautionary Principle/Standard and the Principle/Standard of Pollution Prevention, as mandated by the Montana Supreme Court decision *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236) are in effect ARARS for Montana Pole Plant.

How does this discussion apply to the Montana Pole Plant?

I would like to reiterate what I have written before about dioxin.

I am deeply concerned that dioxin at the Montana Pole Plant still presents a significant, unremediated threat to human health and the environment. I am deeply concerned about the permanence and protectiveness of the proposed caps for Montana Pole. Until this problem is corrected, Silver Bow Creek cannot be fully restored and talk of future land use at the site is premature.

There are no safe levels of exposure to dioxin. An EPA report in 2012 concluded that, after reviewing mounds of evidence, there are potentially serious health effects at ultra-low levels of exposure to dioxin. Other scientific studies have linked dioxins to cancer, disrupted hormones, reproductive damage such as reduced sperm counts, neurological effects in children and adults, immune system changes and skin disorders. (EPA, Environmental Health News) Studies have shown serious health effects at parts per trillion exposure to dioxin. No wonder dioxin is considered to be one of the most toxic substances known to human beings.

The EPA lists the following as health risks associated with dioxin.

Dioxins are highly toxic and can cause cancer, reproductive and developmental problems, damage to the immune system, and can interfere with hormones.

Given that there are no safe levels of dioxin exposure, given that dioxins attack numerous human organs, given that dioxins persist over time because of their chemical stability and tendency to accumulate in the body's fatty tissue (The WHO estimates that the half-life in the body of dioxin is estimated to be 7 to 11 years.), given the fact that people are already exposed to dioxin and their toxic burden should not be increased and given the highly toxic nature of the dioxins (that cause problems of the reproductive and developmental systems, damage to the immune system and are a potent carcinogen) that will remain in the area of restricted use at the Montana Pole Plant, my concern is whether or not the capping that will be done will be adequate to protect public health and the environment.

I repeat the above because the threat of the dioxin found at Montana Pole Plant is significant. There is a potential that as long as dioxin is left on site and not treated or removed a risk is posed for the public. There is uncertainty protective the caps will be over time. (In a separate email, I have documented the problems with caps.) There is uncertainty as to how the environment can cope with leaving dioxin in place, given that it is mobile in water. There is uncertainty as to what will be the regulatory regime in the future in that there is uncertainty as to what will be the human regulatory environment in the future. There is uncertainty regarding environmental interactions and the long term predicted limitations of capping. Significant data gaps at Montana Pole produce regulatory uncertainty. It is for these reasons that CERCLA calls for permanent remedies that emphasize treatment over containment and the reduction in the toxicity, mobility and volume of contaminants. It is for these reasons that as mandated by Federal and Montana state law, the Precautionary Principle and the Principle of Pollution Prevention, which still applies even when toxic waste is present, should apply. Where there is existing uncertainty and the potential for harm to human health and the environment, the Precautionary Principle and the Principle of Pollution Prevention applies. The burden of proof is on those who want to leave dioxin in place to prove that they are abiding by the requirement of the Precautionary Principle and the Principle of Pollution Prevention.

At a minimum the following needs to be done:

1. Check and double check the feasibility of using bio-remediation to treat the dioxin. This is what was mandated in the ROD for the Pole Plant. This approach would clean up the site of dioxin by treating the dioxin and would reduce the toxicity, mobility and volume of the contamination. It would meet the Superfund mandate for permanence. It would meet the mandates of the Precautionary Principle and the Principle of Pollution Prevention which are part of state and federal law.
2. If bio-remediation is convincingly found to be impracticable, investigate other treatment modalities for the site.
3. Revisit the practicability of incineration.
4. Admit that dioxin is mobile in water and plan accordingly.
5. If, as a very last resort, capping becomes the only alternative, mandate and ET cap.

6. Clearly articulate from where the additional money that will be needed for the cleanup will come.
7. Prove that the stormwater control protocols for the site will be efficacious.
8. Comprehensively address future land uses for the site.
9. Articulate a comprehensive plan for dealing with contamination under the interstate and indicate what will be the source of money.

EMAIL K

From: [REDACTED] <[REDACTED]@yahoo.com>
Date: March 7, 2020 at 12:47:33 PM EST
To: "[REDACTED]" <[REDACTED]@mt.gov>, [REDACTED] <[REDACTED]@epa.gov>
Cc: [REDACTED] <[REDACTED]@yahoo.com>, "[REDACTED]" <[REDACTED]@mt.gov>
Subject: [EXTERNAL] Additional Comment Pursuant to the Public Comment Period for Montana Pole Plant

Through the responsiveness summary, what assurances can be offered that all efforts were exhausted before deciding to abandon active biological treatment of the dioxins at the Montana Pole Plant in favor of passive capping?

Also, what has become of the dioxin that is and has been discharged from Montana Pole Plant into Silver Bow Creek?

Does it present a threat to human health and the environment?

Is it still present in the Creek?

Will it be remediated?

Has it been measured?

What will be done about it?

Please see comments below which I would also like to have counted and included as public comment during the comment period on the ESD for Montana Pole Plant.

[REDACTED]

1. The Record of Decision for the Montana Pole Plant clearly calls for active treatment of the waste as the primary cleanup method. The ROD does not support keeping waste in place as the primary or major approach to cleanup. Somewhere along the way, the emphasis on active treatment was changed to an emphasis on containment under caps. That was pretty clear at the Tuesday night (October 29, 2013) Pole Plant meeting. Pages 6, 7, and 35 of the Pole Plant ROD clearly stipulate that active treatment will be the cleanup method. In the Record of Decision—Montana Pole Plant we find this quotation that exemplifies the position in the Record of Decision:

All accessible contaminated soils and LNAPL will be excavated to the extent practicable and treated, preventing this material from continuing to contaminate groundwater. The selected remedy will also satisfy the preference for treatment as a principal element of the remedy. Page 35

2. Active biological treatment does work on wastes such as we find at the Pole Plant and in our climate. For example, an article entitled: "Treatment of Dioxin Contaminate Soils," Standberg, et. al, published in November 2011 by the Swedish Environmental Research Institute provides compelling evidence of the efficacy of active biological treatment on wastes similar to those found at the Pole Plant and in a climate similar to Butte's climate. See also: Biodgradation of Dioxins and Furans by Rolf Wittich, July 15, 1998):

Bioremediation of organic pollutants and heavy metals by use of microorganisms represents a safe, inexpensive, and environmentally-friendly concept in modern environmental engineering. During the last three decades intense efforts have been made by microbiologists and environmental engineers in the isolation and characterization of microorganisms capable of degradation, transformation and detoxification of recalcitrant chemical compounds of environmental concern: (polyhalogenated) dibenzo-p-dioxins, dibenzofurans, and diphenyl ethers. Special emphasis is placed on the potential of molecular biology techniques to improve presently available biocatalysts. (Biodgradation of Dioxins and Furans by Rolf Wittich, July 15, 1998)

3. Dioxin is mobile in soils such as those at the Montana Pole Plant. The ROD itself says that it is possible for dioxin in soils to migrate. (Page 14) There are present in the Montana Pole Plant soils co-contaminants that can mobilize dioxin. In addition, the caps that are used will not prevent surface water and other contaminants from leaching down and mobilizing dioxin. Given the problems of caps with bio-irrigation, advection, desiccation, erosion, weathering, bio-intrusion and stabilization, the dioxin in the soil will be mobilized. Only in a pure lab setting does dioxin remain non-mobile. Certainly the Montana Pole Plant is not a pure lab setting. (See: Dioxin reservoirs in southern Viet Nam--A legacy of Agent Orange by Divernychuk, et al in *Chemosphere* 47 (2002) 117-137. Similar findings are reported in the following:

1. Soil-Plant Transfer of Polychlorinated Dibenzo-p-dioxins and Dibenzofurans to Vegetables of the Cucumber Family (Cucurbitaceae) Anke. Huelster [pubs.acs.org] , Jochen F. Mueller [pubs.acs.org] , Horst. Marschner [pubs.acs.org] *Environ. Sci. Technol.*, 1994, 28 (6), pp 1110–1115 DOI: 10.1021/es00055a021 Publication Date: June 1994 (Article: Indicates that dioxin is mobilized in soils as the result of plant activity. Given that there will only be a 12 inch cap over dioxin contaminated soils and the cap will have vegetative cover, the vegetative cover will absorb dioxin and bring it to the surface.)
2. Sorption of 2,3,7,8-tetrachlorodibenzo-p-dioxin to soils from water/methanol mixtures Richard W. Walters [pubs.acs.org] , Annette. Guiseppi-Elie [pubs.acs.org] *Environ. Sci. Technol.*, 1988, 22 (7), pp 819–825 DOI: 10.1021/es00172a012 Publication Date: July 1988
3. Study by U.S. Dept. of Agriculture indicated that dioxin is only immobile in soils devoid of other organic material. If any organic co-solvents, as are present at the Pole Plant, are in the soil, mobility will occur.
4. SUBSTANTIAL MIGRATION OF DIOXINS IN AGROCHEMICAL FORMULATIONS, Grant, Sharon, Mortimer, Munro, Stevenson, Gavin, Malcolm, Don and Gaus, Caroline, The University of Queensland (National Research Centre for Environmental Toxicology (EnTox)), 39 However, the presence of co-contaminants can act as transport facilitators for otherwise low mobility organic compounds (LMOCs) These results highlight that the paradigm of LMOCs being non mobile in soils should be considered carefully together with application specific and environmental factors which may have the ability to considerably change the predicted environmental fate of these chemicals. (This article supports the above mentioned study by the U.S. Department of Agriculture that if, as we find at the Pole Plant, co-contaminants are present, dioxin does become mobile in soil. The point is that since the remedy for the Pole Plant was changed from one of active treatment to containment, co-contaminants that will make dioxin mobile in soil will be present.
5. Assessment of Dioxin Contamination at Sawmill Sites: A Report to the Ministry for the Environment by Tonkin & Taylor Ltd and SPHERE, Prepared for the New Zealand Ministry for the Environment

October 2008 (conclusions are similar to the one's I included in my earlier email to you today, i.e. that dioxin is mobile in both soil and water.

Also, data presented by the MDEQ at the Tuesday meeting indicated that dioxin is present in the recovery trenches at the Pole Plant. If dioxin isn't mobile in soil at the Pole Plant, how did the dioxin get in the recovery trenches? Another point that Ian made: MDEQ is in charge of the cleanup in Missoula of the White Pine Sash site. This site was a wood treatment facility similar to Montana Pole. The MDEQ acknowledges at this site that dioxin can be mobile in soils. Why not acknowledge the same at Montana Pole? Finally, the dioxin levels that we are now seeing in groundwater at the Montana Pole Plant were

not supposed to have been reached until 200,000 years from now according to MDEQ. Why, if dioxin is not mobile, are we seeing dioxin now that we should not have seen for 200,000 years?

Summary of my position:

1. The bottom line is that the dioxins, pcps, pahs and furans found at the site are highly toxic and carcinogenic. Dioxin poses a serious threat to both human health and the environment. There are no safe levels of exposure to dioxin. (EPA) In fact, dioxin has been referred to as the “most toxic chemical known.” (Hazardous Waste in America, Epstein, Brown and Pope) Lethal effects of dioxin can be seen at very low levels—a millionth of a gram can kill lab animals. Dioxin was the toxic found in Agent Orange and at New York’s Love Canal. Dioxin causes serious cancerous and non-cancerous human health effects. (World Health Organization) Dioxin can produce multiple types of cancer. Non-cancerous health effects include type 2 diabetes, impaired immune system, ischemic heart disease, endometriosis, decreased fertility, inability to carry pregnancies to term, birth defects and learning disabilities. According to the National Institute of Environmental Health Sciences, the “dangers of dioxin last for decades after initial exposure.” Just dealing with contaminant level statistics can mask the danger posed by these contaminants.
2. These toxics will largely remain on site to pose a perpetual threat to human health and the environment. The site will never be cleaned up.
3. Even the data presented tonight shows that these toxics have been released. Perhaps not in large quantities, perhaps not all the time, but given the toxicity of the materials even relatively small releases are problematic. And given that the site will not be cleaned up, these releases will continue in perpetuity.
4. Based on the discussion of the DEQ 7 standards, it is obvious that the cleanup levels in the original Record of Decision for the Pole Plant are not protective. The problem is that the current cleanup is not meeting, in a significant number of cases, the DEQ 7 standards. Yet the presentation tonight continually referred to meeting the outdated, non-protective EPA standards in the Record of Decision. Probably, the old Record of Decision will never be reopened.
5. The comparisons of the Pole Plant site to other sites presented at tonight's meeting don't prove anything. Because, for example, the Pole Plant is comparable to other similar sites does not mean that the Butte cleanup is working to protect human health and the environment.
6. The extensive use of caps for the Pole Plant is very problematic. Butte's history with capping toxic waste has not been good. Caps have been very problematic. The dioxins and other contaminants at the Pole Plant will all be just left in place, covered with only 12 inches of topsoil caps. Previous capping on the Butte Hill, which uses more soil than the level at the Pole Plant, has not worked well. We have a situation where the most toxic substances in Butte (dioxins, PCPs and furans) are to be covered with the least amount of soil. Caps, as we have seen in 5 Butte, already are susceptible to failure by means of bio-irrigation, advection, dessication, erosion, weathering, bio-intrusion and stabilization problems. Caps also have significant construction, repair and maintenance problems.
7. Because the responsible parties for the cleanup cashed out, we better get it right now. The money for the cleanup is limited.

In short:

The Record of Decision for Montana Pole promised that the dioxins, furans, PCPs and PAHs found at the site (all are serious health threats) would be biologically treated and the site cleaned up. Contrary to the promise of cleanup, the MDEQ and EPA have reneged on this promise. MDEQ and EPA have largely abandoned treatment in favor of containment, leaving the threat in place. Now, cleanup will consist of leaving all of these toxics on site and “managing them” through institutional controls. The EPA itself says that the toxicity of dioxin exists for an extended period of time. Containment is contrary to the

Superfund mandate that treatment is to be preferred over leaving waste in place. The shoddy cleanup at the Pole Plant perpetuates a public health threat that should and could have been fixed.

However, the current containment remedy is not working. Dioxin is still being released .The groundwater treatment system that was implemented at the Pole Plant site still allows for significant discharge of dioxin into Silver Bow Creek— 100 times the current dioxin surface water standard. Such discharges will continue for decades to come. MDEQ's own discharge study said that MDEQ's planned cleanup approach would still allow dioxin to be discharged into Silver Bow Creek. MDEQ has ignored this problem and continues to implement a non-protective cleanup. Why was a sub-par cleanup approach selected? The threat to human health is particularly acute for those living near the Pole Plant.

So, while progress has been made, the rosy picture presented at the October 29th meeting doesnot give us a full picture of what is going on at the Pole Plant.

In addition to the citations I provided in this document, I would also ask that you review Ian's submission of November 5, 2013 to the CTEC board giving his reactions to the conclusions presented at the October 29, 2013 meeting.

The following is the email from [REDACTED] of March 27, 2013 which I include as a reference point.

From: [REDACTED] <[REDACTED]@kirkenr.com>
To: [REDACTED] <[REDACTED]@wet-llc.com>; [REDACTED] <[REDACTED]@blm.gov>; [REDACTED] <[REDACTED]@gmail.com>; [REDACTED] <[REDACTED]@mtech.edu>; "[REDACTED]@gmail.com" <[REDACTED]@gmail.com>; [REDACTED] <[REDACTED]@bresnan.net>; [REDACTED] <[REDACTED]@montana.com>; [REDACTED] <[REDACTED]@mtech.edu>; [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@hotmail.com>; [REDACTED]@mse-ta.com [REDACTED]@mse-ta.com
Sent: Wednesday, March 27, 2013 9:18 AM
Subject: MT Pole

[REDACTED]

I thought I would summarize for you the important points from the Montana Pole update at the meeting the other night.

1. The groundwater treatment system discharges dioxin into Silver Creek at 100 times the current very low surface water standard. This is expected to continue for decades under the current plan. It needs to be shown that this will not impact the health of aquatic life, fish, or people who eat them.
2. The Five Year Review from 2011 included three action items that the agencies would summarize for the layperson and distribute to the public the review findings, air monitoring health risks, and that they sampled soil where the wind-break trees died. This was to be an important response to citizens comments and still needs to happen.

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

EMAIL

From: [REDACTED] <[REDACTED]@yahoo.com>

Date: March 7, 2020 at 5:13:27 PM EST

To: "[REDACTED]" <[REDACTED]@mt.gov>, [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>, "[REDACTED]" <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Public Comment Montana Pole Plant ESD

Five year reviews of the Montana Pole Plant constantly point to failures of the remedy to meet remediation targets. What assurances does the public have that these cleanup targets will be met in the future?

Specifically, where in the ESD can MDEQ point to deficiencies noted in the last and previous Five Year Review of the Montana Pole Plant that have been corrected? Please be as specific as possible. If they have not been corrected, why? What will be done in the future to correct these deficiencies?

Please consider the above as public comment on Montana Pole. I respectfully request that these questions as well as the other questions about the ESD and remediation of Montana Pole Plant in my previous public comments on the ESD that I have submitted be addressed in the responsiveness summary.

[REDACTED]

EMAIL M

From: [REDACTED] <[REDACTED]@yahoo.com>

Date: March 7, 2020 at 5:27:58 PM EST

To: "[REDACTED]" <[REDACTED]@mt.gov>, [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>, "[REDACTED]" <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment--Montana Pole Plant

What assurances can you give that the proposed CAMU for Montana Pole Plant that the ESD mandates and requires complies with the provisions of the following:

40 CFR Parts 260, 264, and 271 Amendments to the Corrective Action Management Unit Rule; Final Rule (2002) and

40 CFR Parts 260,264,26.5,268,270 and 271 [FRL4555-71 which still pertain to CAMUs.

If not, why not? Please be specific in your response.

Can it be demonstrated that the proposed CAMU for Montana Pole Plant complies with all the rules, regulations and guidance documents issued pursuant to these rules regarding the use, construction, monitoring and maintenance of CAMUs? Please do so. If not, why not?

Above submitted as part of the public comment period on Montana Pole Plant.

[REDACTED]

EMAIL N

From: [REDACTED] <[REDACTED]@yahoo.com>

Sent: Monday, March 09, 2020 5:35 AM

To: [REDACTED] e <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment--Montana Pole Plant

Additional Public Comment pursuant to public comment period Montana Pole Plant

[REDACTED]

As a follow up to an earlier submission:

Specifically, in regard to the proposed CAMU at Montana Pole Plant, how were the seven decision criteria that apply to

CAMUs under 40 CFR 264.552(c) applied and realized? I would request that each of the seven be addressed individually.

Under 40 CFR 264.552(d), the owner/operator of the CAMU is required to submit all the necessary information and documentation. How does MDEQ plan to comply with this section? Who will submit the paperwork? Who will prepare it?

In general, how does MDEQ plan to address the criteria for CAMUs in 40 CFR 264.552? The literature on CAMUs stipulate that it is vital that use of and access to CAMUs be strictly controlled. Is the planned recreational use of the CAMU site compatible with the protectiveness of the remedy? Would trails on the CAMU be safe? Could recreational use compromise the remedy? What will be done to prevent this from taking place?

The CAMU is only as good as its operation and maintenance? Has MDEQ developed a detailed and specific operation and maintenance plan for the CAMU post ROD ESD?

Will the public be able to comment on this O and M plan? If so, when and how? If not, why not? How will MDEQ keep the public informed?

Will modifications to the community involvement plan for Montana Pole Plant be made post-ESD? If so, how? If not, why not given that this is a significant change that would warrant a change in the community involvement plan for the site post-ESD?

EMAIL O

From: [REDACTED] <[REDACTED]@yahoo.com>

Sent: Monday, March 09, 2020 8:27 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment Montana Pole Plant

Additional public comment Montana Pole Plant-- [REDACTED]

I would ask that the following be addressed.

The CAMU cap has a limited lifespan, much shorter than the dioxin it is meant to cover. Some estimates are thirty to fifty years at best. What provisions are there for replacing the cap when needed? How will it be determined that the cap needs to be replaced? What exposure dangers are there when between the time the cap is discovered to be failing and the replacement of the cap? Who will pay? Will there be enough money?

CAMU caps often have problems regarding the establishment of ground vegetative cover, particularly in this climate. For example, how will the vegetative cover be irrigated? Will this irrigation lessen the protectiveness of the cap?

What protocols are in place to protect the cap membrane from degradation due to sunlight, as well as chemical and biological degradation? How will this be monitored?

Small tears or punctures often occur when the soil cover is placed over the membrane, thus compromising the protectiveness of the cap. What will be done to prevent this from happening and to monitor the situation.

How frequently will the capped be monitored as to performance? By whom? By what methodology?

What about lateral infiltration due to rain? How will this be monitored and controlled? Will the cap be extended beyond the contaminated area to prevent this? How far will it be extended?

Are there sufficient protections to prevent the horizontal flow of groundwater through the waste?

What specific provisions are in place to protect the CAMU from the effects of climate change that could threaten the site?

EMAIL P

From: [REDACTED] <[REDACTED]@yahoo.com>

Sent: Monday, March 09, 2020 11:38 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment pursuant to Montana Pole Plant public comment period.

Submitted by [REDACTED]

I would appreciate these questions being answered in the responsiveness summary for the ESD at Montana Pole Plant.

Will the proposed CAMU and cap associated with it affect soil hydrology as has occurred at other sites?

Will this affect the protectiveness of the entire remedy for Montana Pole Plant?

Will this affect the protectiveness of the CAMU?

Will altered soil hydrology create synergistic or cumulative affects on the protectiveness of the CAMU remedy?

Could altered soil hydrology create other remedy problems for the site?

Could altered soil hydrology affect end land use?

Will altered soil hydrology potentially affect discharge into Silver Bow Creek?

EMAIL Q

From: [REDACTED] <[REDACTED]@bsb.mt.gov>

Sent: Monday, March 09, 2020 3:27 PM

To: [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Fwd: Let Us Not Forget the Montana Pole Plant

Submitted by: [REDACTED]

While Superfund attention is focused rightly on the Consent Decree for Uptown Butte, we cannot lose sight of another important Butte Superfund site—the Montana Pole Plant. Currently, modifications to the remedy at the Pole Plant are under consideration by the Montana Department of Environmental Quality (MDEQ), which is the lead agency at the site. The Pole Plant, because of dioxin on site, is in some ways the most acutely dangerous Superfund site in Butte. In examining the new remedy for Montana Pole Plant, the following issues and concerns need to be addressed:

1. In the 10/29/2017 edition of the Montana Standard , we find:

- a. MDEQ estimates that it will take 50 years to remove all the petroleum based pollutants out of the groundwater.
- b. There is money to operate the water treatment plant at the Pole Plant for only 30 years, given that the Pole Plant is a cash out site.
- c. So where will MDEQ get the money to operate the water treatment plant for the additional 20 years that it will need to operate to remove all the petroleum based pollutants out of the groundwater? The Montana Standard has never been refuted.

2. Presently, the water treatment plant is not producing water that can meet all of the water quality standards. What assurances does the public have this this will be remedied and the water treatment plant will produce water that is in compliance with water quality standards? MDEQ says that we are "close." But I don't know what that means. How close? When will standards be achieved? Are we looking down the road at another waiver of standards in Butte? If they haven't been able to meet standards in the past, why should we think that they will meet standards in the future? In short, the public is being asked to accept the assurances of the MDEQ that all will work out. Given past occurrences, this may not be the surest bet to take.

3. The contamination under the Interstate poses significant risk to the cleanup of the Pole Plant. When and how will this be addressed? The state is very unclear in terms of addressing contamination under the interstate. Unless the contamination under the interstate is remediated, the remedy for Montana Pole will be compromised.

4. Dioxin is very dangerous. There are really no safe levels of exposure. MDEQ proposes to leave the dioxin on site, unremediated, with a cap. Caps in Butte have a very problematic history and we must remember that the contamination in the rest of Butte outside of the Pole Plant is nowhere near as toxic as the threat from dioxin. The proposal is to allow recreational use over the dioxin cap. Is that wise? Is that protective? How permanent is the proposed cap lining? On a recent tour I saw some of the present lining exposed to sunlight that degrades the cap. There are also unanswered issues regarding the long term maintenance of the cap. Is there enough money to maintain the cap? Caps leave a threat in place and do nothing to reduce contaminants. Will there be enough money to maintain the cap?

5. What will be the future land use for the site? This is still very much up in the air. You sure don't want people running around the site.

6. Are the proposed stormwater controls sufficient to protect the cap from erosion?

7. The new plan proposes heavy reliance on institutional controls which have proved to be problematic at other Superfund sites. Will there be enough money to maintain these institutional controls? How and who will maintain these institutional controls?

8. This is a cash out site with very limited money for cleanup and no practical source for more. Is there enough money in the "pot" to adequately clean up and maintain the site? Earlier I raised the issue of insufficient funds to operate the water treatment plant for as long as it is needed and to maintain the caps.

9. In the past MDEQ has not done a good job in keeping the public and particularly the nearby residents informed as to what is going on. Will that improve? How will that improve?

10. Given the remediation protocol outlined in the new plan, odors emanating from the Pole Plant could again become an issue. What will MDEQ do to mitigate the effects of odors emanating from the Pole Plant?

11. MDEQ has had a "spotty" record in meeting the requirements of the Record of Decision for the site and water quality standards. What assurances can be given to the public that going forward the Pole Plant will be in compliance?

Before we can be supportive or comfortable with the Montana Pole Plant cleanup, these issues must be addressed the these questions answered.

Messages and attachments sent to or from this email account pertaining to the City-County of Butte-Silver Bow business may be considered public or private records depending on the message content (Article II Section 9, Montana Constitution; 2-6 MCA).

EMAIL R

From: [REDACTED] <[REDACTED]@gmail.com>

Sent: Monday, March 09, 2020 1:10 PM

To: [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Fwd: Pole plant clean up

[REDACTED]:

Living in Williamsburg and knowing about the Montana Pole plant and the Oas family, I am encouraged by the plans you laid out at the Butte Brewery a week or 10 days ago.

Thank you so much for your continued professionalism and willingness to take our comments seriously.

Certainly I support what you're doing and would ask you to consider hooking Copper mountain area south of Williamsburg with a bike trail that would link us to both the rocker bike trail, Butte Hill and the flats bike trail with the Greenway Trail that eventually will continue on to Fairmont and into Deer Lodge. Viewing out the window of my house here in Williamsburg I see new power poles about 50 feet high, along side the existing water treatment plant wondering, if that's part of the program. Greenwood Avenue could use some attention.

Best personal regards. Would like to know if you receive this email. Generally I don't send them because because I like to write letters in cursive like the olden days, however I am late in getting this comment out.

Sincerely,

[REDACTED]
[REDACTED]

EMAILS

From: [REDACTED] <[REDACTED]@dgslaw.com>
Sent: Tuesday, March 10, 2020 4:16 PM
To: [REDACTED] <[REDACTED]@mt.gov>
Cc: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@mt.gov>; [REDACTED]@epa.gov;
[REDACTED] <[REDACTED]@epa.gov>; [REDACTED] <[REDACTED]@epa.gov>; [REDACTED]
<[REDACTED]@epa.gov>; [REDACTED] <[REDACTED]@bp.com>; [REDACTED] <[REDACTED]@bp.com>;
[REDACTED] <[REDACTED]@dgslaw.com>; [REDACTED] <[REDACTED]@dgslaw.com>; [REDACTED]
<[REDACTED]@bsb.mt.gov>; [REDACTED] <[REDACTED]@bsb.mt.gov>; [REDACTED] <[REDACTED]@bsb.mt.gov>; [REDACTED]
[REDACTED] <[REDACTED]@bsb.mt.gov>; [REDACTED] <[REDACTED]@bsb.mt.gov>; [REDACTED]
([REDACTED]@bp.com) <[REDACTED]@bp.com>
Subject: [EXTERNAL] [REDACTED]

[REDACTED]

[REDACTED]

March 10, 2020

VIA FEDEX AND EMAIL

[REDACTED]
DEQ Project Manager
[REDACTED]
Helena, MT 59620
[REDACTED]

Subject: Montana Pole and Treating Plant Site
[REDACTED]

Dear [REDACTED]:

Atlantic Richfield Company (AR) submits the attached comments on the February 2020 Explanation of Significant Differences (ESD) for the Montana Pole and Treating Plant National Priority List Site (MPTP or Site), which identifies five “significant” changes to the remedy identified in the 1993 Record of Decision (1993 ROD) for the MPTP. The Montana Department of Environmental Quality (DEQ), in consultation with the United States Environmental Protection Agency (EPA), issued the ESD on February 3, 2020, and public comments are being accepted through March 10, 2020.

As an initial matter, AR would like to thank DEQ and EPA for the work the agencies have put into implementation of the remediation at the MPTP to date under the terms of the 1996 Consent Decree. AR has a unique interest in the remedy for the Site. In 1996, the United States, State of Montana (State), AR, Burlington Northern Railroad Company (BNSF), and Montana Resources, Inc., Inland Properties Inc., and Dennis Washington (collectively referred to as MRI herein) entered a consent decree for the MPTP remedy (1996 Consent Decree). Under the 1996 Consent Decree, the State agreed to implement a remedy for the MPTP site, using an agreed

amount of funding provided by the settling defendants (AR, BNSF and MRI). The settlement contains an “Additional Response Cost Reopener” and other standard reopener provisions for new information and/or unknown conditions, which might be used to require the settling defendants to provide additional funding for MPTP remediation under certain



4693660.4

circumstances. *Σεε* 1996 Consent Decree, §§ VII (Additional Response Cost Reopener), XII (Pre-Certification Reservations), and XIII (Post-Certification Reservations). AR also has a unique interest in any changes to the MPTP remedy that could impact its obligation to perform remediation in the adjacent Butte Priority Soils Operable Unit Site (BPSOU), where AR is one of several parties that are potentially responsible for funding and implementation of CERCLA remedies at that site. For these reasons, AR respectfully submits the attached comments on the MPTP ESD for the agencies' consideration.

AR's comments are separated into general comments and specific, detailed comments on each of the five changes identified in the [ESD](#). AR requests that these comments be included in the Administrative Record for the MPTP, and that the agencies respond to these comments if and when the final ESD is issued.

AR appreciates DEQ's careful consideration of these comments as it completes the ESD remedy modification process. Please contact me if you have any related questions.

Sincerely,



[REDACTED]

Cc (via email):

- [REDACTED] - DEQ
- [REDACTED] - DEQ
- [REDACTED] - EPA
- [REDACTED] - EPA
- [REDACTED] - EPA
- [REDACTED] - EPA
- [REDACTED] - AR
- [REDACTED] - AR
- [REDACTED] - DGS
- [REDACTED] - DGS
- [REDACTED] - BSB
- [REDACTED] - BSB
- [REDACTED] - BSB
- [REDACTED] - BSB
- [REDACTED] - BSB

GENERAL COMMENTS ON ESD

1. General Comment #1 – The Proposed Changes Cumulatively Amount to a “Fundamental” Change Warranting a ROD Amendment.

The draft ESD states that the five proposed remedy changes “are significant changes to the remedy identified in the 1993 ROD to address site-specific conditions and issues identified in the Fourth Five-Year Review (FYR) Report for the [MPTP] (April 2017), but these changes do not fundamentally alter the basic features of the remedy selected in the 1993 **ROD.**” **ESD** at 1; *see also id.* at 8, 10, 11, 13. Accordingly, DEQ has concluded that the changes can be made pursuant to an ESD, rather than a ROD Amendment, which is required for “fundamental” remedy changes. *See* 40 C.F.R. § 300.430(e).

Although some of the proposed changes, considered independently, could be characterized as merely “significant,” AR does not agree with DEQ’s characterization of the collective changes to the remedy as merely “significant.” Considering each change separately—in order to avoid the application of important NCP requirements to the combination of proposed changes—is inconsistent with CERCLA guidance and established practice. Specifically, CERCLA Guidance indicates that remedy modifications proposed together should be considered collectively and characterized as fundamental or significant based on their collective impact. *See* EPA OSWER 9200.1-23P, *Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents*, § 7.2 (July 1999) (ROD Guidance).

The collective impacts of the changes identified in the ESD—in terms of scope, performance, and cost—may amount to a “fundamental” change to the remedy identified in the 1993 ROD. *See* 40 CFR § 300.435(c)(2); ROD Guidance, § 7.2 (requiring EPA to evaluate “scope, performance, and cost” in characterizing changes to a remedy). If viewed in this manner, the combination of all of the proposed remedy modifications identified in the ESD would be characterized, evaluated, and adopted as a “fundamental” change in accordance with NCP requirements applicable to ROD amendments. This includes providing meaningful agency responses to comments on all proposed changes; evaluating all changes under the NCP criteria; and adopting any approved changes as part of a ROD Amendment.

AR’s concern is that the information provided by the agencies in support of the ESD is not sufficient to fully analyze the remedy changes proposed and consider whether such changes collectively should be characterized as a “fundamental” change in remedy scope, performance and/or cost. The missing information is described further in AR’s General Comment #3 and #2 and the Specific Comments below.

2. General Comment #2 – Future ESDs or RD Amendments.

The draft ESD states that “[a] separate ESD or ROD Amendment is anticipated to address other items identified in the *Fourth FYR Report* that pertain to groundwater and surface water.” ESD at 7. Based on the information provided in the *Fourth FYR Report* and the ESD, the reader cannot determine what “other items” need to be addressed. Based on the information available at this time, AR does not agree that there is a basis to further amend the MPTP remedy identified in the 1993 ROD. Moreover, if DEQ is planning to issue one or more additional ROD amendments and/or another ESD, such changes should be presented and analyzed in conjunction with the remedy changes described in this proposed [ESD](#). AR reserves the right to comment on and/or object to any separate future ESDs or ROD amendments intended to further modify the MPTP remedy selected in the 1993 ROD, including objections to proposed changes that are not necessary to protect human health and the environment, or are otherwise inconsistent with the NCP.

3. General Comment #3 – The Draft ESD Provides Inadequate Cost Information.

On multiple occasions, the draft ESD posits that the proposed changes will not fundamentally alter the costs associated with the MPTP remedy. For example, the ESD states “[c]ost increases incurred by adding the CAMU are unlikely to make the remedy exceed five percent of the costs estimated in the **ROD.**” ESD at 10; *see also id.* at 11, 13, tbl. 2. However, other than the agencies’ blanket assertions that costs will not materially increase due to the proposed changes, the ESD contains no meaningful analysis or documentation to support the ESD statements regarding costs.

The agencies are required to properly and adequately assess costs associated with post-ROD changes. *See* 40 C.F.R. § 300.435(c)(2); *see also* ROD Guidance, §§ 7-2 and 7-3. The proposed and any final ESD should both include a more fulsome analysis of costs associated with the MPTP remedy changes, as well as documentation to support such an analysis. Further, as discussed above, if the more-detailed cost analysis demonstrates that the changes will significantly increase costs associated with the MPTP remedy, it may require a ROD amendment, rather than an ESD (*see* General Comment #1, above).

SPECIFIC COMMENTS ON ESD

1. Comment on Significant Difference #1 – Revision of Soil Clean-up Standards for Human Exposure.

Soil cleanup levels were set in the 1993 ROD based on a 1×10^{-6} cancer risk level for “the most susceptible exposure pathway” for recreational land use at the Site for each constituent of concern (exact language quoted below). *See* 1993 ROD at Decision Summary, § IX. Specifically, dermal risk was used to set the PCP cleanup level of 34,000 $\mu\text{g}/\text{kg}$, while ingestion risk was used to set the dioxins/furans and PAH cleanup levels (0.2 $\mu\text{g}/\text{kg}$ and 4,200 $\mu\text{g}/\text{kg}$, respectively). The correct terminology for this would be “the most susceptible exposure route.” Total cancer risks for dioxins/furans for all exposure routes were 1.7×10^{-6} , and total cancer risks for all three chemicals were 3.86×10^{-6} . Thus, the 1993 ROD contemplates that acceptable total risk for recreational use is about 4×10^{-6} .

The 1993 ROD also states “[s]oil cleanup levels have been developed to protect recreational and industrial land users at the site from excessive health risks.” 1993 ROD at p. 37. The ESD incorrectly claims that “the 1993 ROD based soil cleanup levels for human exposure on recreational use RPGS, and not on industrial use PRGs.” Table 24 of the 1993 ROD includes both recreational and industrial risks at the selected cleanup levels. Total risks for industrial land users at these cleanup levels were estimated to be 2×10^{-5} , and the total risks for all exposure routes for dioxins/furans were estimated to be 9.13×10^{-6} . Thus, based on the language in the 1993 ROD, no changes to the MPTP remedy are necessary as long as the cleanup levels are still protective for industrial land use at a total cancer risk level of 2×10^{-5} .

The ESD proposes to lower the soil cleanup levels based on updated exposure parameters and toxicity criteria along with using a 1×10^{-6} cancer risk level for all evaluated exposures (i.e., recreational, industrial, and construction worker). AR does not object to updating the derivation of the cleanup levels using the latest exposure factors and toxicity values, but disagrees that cleanup levels based on industrial and construction worker exposure should utilize 1×10^{-6} cancer risk levels. Specifically, the 1993 ROD: (1) states that industrial cleanup levels based on total cancer risk of 2×10^{-5} are protective; and (2) does not base cleanup levels on cumulative cancer risk for recreational exposure by all routes of exposure of 1×10^{-6} , but instead bases it on the risk for the most susceptible exposure route. In the case of dioxins/furans, the cumulative cancer risk for all routes in the 1993 ROD was 1.7×10^{-6} .

The 1993 ROD states the following regarding cleanup levels:

[C]leanup levels and the selection of the remedy are based upon an assumption of adequate institutional controls to prevent any residential use at the site. Soil cleanup levels have been developed to protect recreational and industrial land users at the site from excessive health risks. If, for any reason, appropriate land restrictions are not actually implemented, cleanup goals will be adjusted accordingly.

Cleanup levels for site soils are listed in Table 23. These levels are based on a 1 in 1,000,000 cancer risk level for recreational land use at the site for each contaminant of concern for the most susceptible exposure pathway. For example, the cleanup level for PCP corresponds to a 10⁻⁶ risk level via dermal exposure, while the cleanup level for dioxins is based on a 10⁻⁶ risk level via ingestion. These cleanup levels correspond to total cancer risk of approximately 3.86 x 10⁻⁶ when risks for all contaminants of concern and all pathways are summed (see Table 24). These cleanup levels have been set using the 10⁻⁶ target to be protective. These cleanup levels correspond to a total cancer risk of approximately 2.0 x 10⁻⁵ for industrial land use as shown on Table 24.

1993 ROD at 37.

a) Specific Comment #1a – Table 1 “ESD Cleanup Levels” Do Not Match Those in Attachment B.

Table 1 in Section 3.1 of the ESD compares cleanup levels for human exposure from the 1993 ROD with those in the ESD, referencing a DEQ technical memorandum in Attachment B to the ESD as a source reference for the ESD values. However, several of the values in Table 1 do not correspond with the values actually presented in Attachment B, and thus the changes proposed in the ESD are not consistent with the technical document cited to support them. Furthermore, the 1993 ROD does not present separate cleanup levels for industrial exposure at 1 x 10⁶. The 1993 ROD only presents the risks for industrial exposure at the selected cleanup levels. In the proposed and final ESD, Table 1 should be revised consistent with Attachment B, as provided in Table 1 below.

Table 1 – Comparison of 1993 ROD and ESD Soil Cleanup Levels for Human Exposure

Chemical	1993 ROD Cleanup Level	ESD Cleanup Levels (Bold)	Basis for Cleanup Level ^c (1993 ROD and ESD)
	Concentration (jig/kg)		
Pentachlorophenol	34,000	34,000	Recreational exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)
		36,000	
	9,000	7,000	Industrial exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)
	NC		
None	2,000^e	Leaching to groundwater ^d (1 x 10 ⁻⁶ carcinogenic risk)	
Dioxins/Furans (TEQ) ^a	0.2	0.1	Recreational exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)

	0.03 NC	0.03e 0.04^e	Industrial exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)
Carcinogenic PAHs (TEQ) ^b	4,200	4,200	Recreational exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)
		2,000	
	700 NC	700e 500^e	Industrial exposure scenario (1 x 10 ⁻⁶ carcinogenic risk)

Notes: **NC = not calculated**; ESD = explanation of significant differences; gig/kg = microgram/kilogram; PAH = polycyclic aromatic hydrocarbon.

ROD = record of decision; SSCL = site-specific cleanup level; TEQ = toxicity equivalency quotient.

a Sum of individual chlorinated dibenzo-p-dioxins and -dibenzofurans concentrations multiplied by their corresponding toxicity equivalence factor (TEFs).

b Sum of individual B2 PAH (benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) concentrations multiplied by their corresponding TEFs.

c Use of the recreational and industrial exposure scenarios at 1 x 10⁻⁶ cancer risk is consistent with the approach in the 1993 ROD, and is protective with respect to ROD objectives when implemented in conjunction with a clarification that future industrial land use will be restricted to areas of the Site where it is demonstrated that the SSCLs for industrial exposure at the 1 x 10⁻⁶ cancer risk level are also met (see ESD Section 3.3 – Significant Difference #3).

d Calculated as a concentration to prevent leaching to groundwater that would cause groundwater concentrations greater than 1.0 gig/L, which is the ROD PCP groundwater cleanup level calculated as the MCL with a 1.7 x 10⁻⁶ excess cancer risk for drinking water.

e **Bold** = Cleanup levels that will determine soil management in CAMU

b) Specific Comment #1b – The SSCLs for PAHs in Attachment B Do Not Reflect Current Toxicity Values and Should Be Seven-Fold Higher.

Section 3.1 of the ESD states the agencies used updated exposure parameters and toxicity criteria included in Attachment B to calculate updated ESD cleanup levels (referred to in Attachment B as site-specific cleanup levels or SSCLs). AR notes that the Attachment B cover page dates the memo 10/3/17, but the date on the memo itself is 5/31/16. This latter date appears to be the correct date because the memo did not incorporate significant toxicity value updates published by EPA on 1/19/17 on the Integrated Risk Information System (IRIS) for benzo(a)pyrene (BaP), which form the basis for the cleanup levels for PAHs. These updates are provided in Table 2 below.

Table 2. Comparison of BaP Toxicity Values

Type	Old BaP Toxicity			New BaP Toxicity		
	Value	Units	Source	Value	Units	Source
Oral Cancer Slope Factor	7.3	(mg/kg/d) ⁻¹	IRIS 1994	1	(mg/kg/d) ⁻¹	IRIS 2017
Inhalation Unit Risk	1.1	(mg/m ³)-1	Cal EPA 1993	0.6	(mg/m ³) ⁻¹	IRIS 2017

Reference Dose	None	3E-04	mg/kg/d	IRIS 2017
Reference Concentration	None	2E-06	mg/m ³	IRIS 2017

Using this updated oral cancer slope factor of 1 (mg/kg/d)⁻¹ for BaP would result in SSCLs approximately seven-fold higher than the ones presented in Attachment B to the ESD for carcinogenic polycyclic aromatic hydrocarbons (cPAH). A comparison of the SSCLs is provided in Table 3 below.

Table 3. Comparison of cPAH Soil Cleanup Levels

Chemical	Recreational		Industrial		Construction	
	Proposed SSCL (µg/kg)	Updated BaP SF SSCL (µg/kg)	Proposed SSCL (µg/kg)	Updated BaP SFSSCL (µg/kg)	Proposed SSCL (µg/kg)	Updated BaP SF SSCL (µg/kg)
Carcinogenic PAHs (TEF)	2,000	14,500	500	3,900	5,000	39,000

Additionally, the Attachment B memo states the cPAH toxicity “is still based upon the toxicity equivalence to benzo(a)pyrene and the same TEFs are used to calculate cPAH TEQ SSCLs as were used to calculate the PRGs.” It isn’t clear that the TEFs do affect the SSCLs, but the toxicity equivalence factors used for the PRGs in the 1993 ROD (Table 28) are not consistent with the relative potency factors (RPF) recommended by EPA in the 1993 *Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons*. A comparison of the RPF and TEF values is provided in Table 4 below.

Table 4. Comparison of PAH TEFs with RPFs

Chemical	1993 EPA RPF	1993 ROD TEF
Benzo(a)anthracene	0.1	0.01
Benzo(b)fluoranthene	0.1	1
Benzo(k)fluoranthene	0.01	0.01
Benzo(a)pyrene	1	1
Benzo(g,h,i)perylene	NA	0.01
Chrysene	0.001	0.01
Dibenz(a,h)anthracene	1	1
Indeno(1,2,3-cd)pyrene	0.1	0.01

c) Specific Comment #1c – To Be Consistent With EPA Guidance, Dioxin/Furan Cleanup Levels Should Be Based On Non-Cancer Risk.

The ESD soil cleanup levels for dioxins/furans are 0.1 µg/kg for recreational settings and 0.04 µg/kg for industrial settings (as noted above, Table 1 of the ESD incorrectly lists the industrial cleanup level as 0.03 µg/kg) based on cancer risks. As discussed in more detail below, basing the dioxins/furans soil cleanup level on cancer risk is inconsistent with current EPA guidance and results in proposed cleanup levels that are *at least ten-fold lower* than the cleanup levels that result when following EPA guidance to use noncancer risks as the basis for dioxins/furans cleanup levels in soil. These lower cleanup levels are overly restrictive, not required to protect human health and the environment, and will potentially increase remedy costs without corresponding benefit for the community.

Since the revised reference dose (RfD) for noncancer effects for 2,3,7,8-tetrachloro dibenzo-p-dioxin (TCDD) was issued by EPA in 2012, the agency has identified the RfD for 2,3,7,8-TCDD as the appropriate basis for derivation of cleanup levels for dioxins/furans. EPA's website entitled *Risk Assessment for Dioxin at Superfund Sites* (EPA 2018) makes clear the agency's intention to derive cleanup levels based on the final EPA (2012) RfD for 2,3,7,8-TCDD and other dioxin and furans based on TEQ. Specifically, the EPA website states:

Frequently Asked Questions and Answers

1. How will the 2012 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) Reference Dose (RfD) impact the cleanup of dioxin-contaminated sites?

In all cases, EPA's goal is protection of human health and the environment informed by the best available science as embodied in the RfD. In accordance with existing EPA guidance:

Human Health Toxicity Values in Superfund Risk Assessments

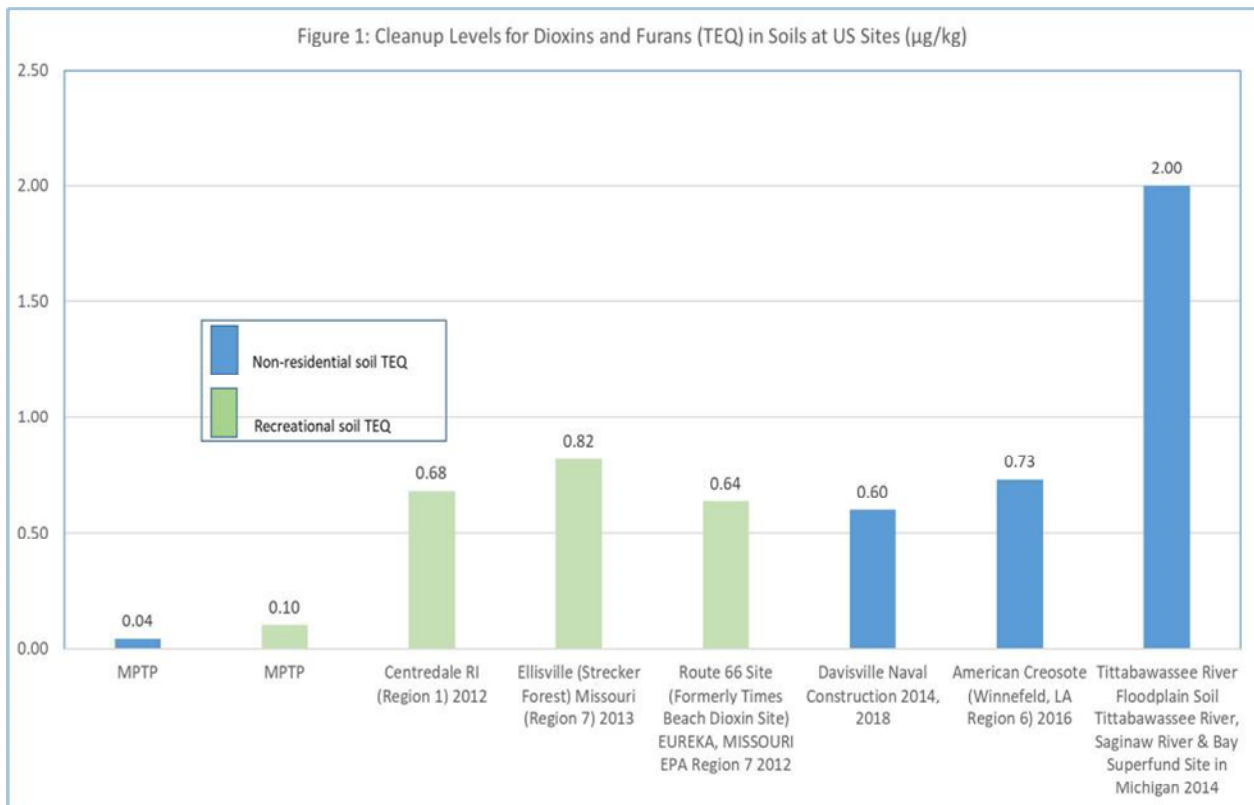
The 2012 RfD for TCDD will be used to develop site-specific risk-based cleanup levels at Superfund sites. At sites that have been previously investigated or cleaned up under Superfund, EPA Regions will consult with EPA Headquarters and will coordinate with state partners to identify, prioritize and evaluate sites to determine if additional response action is needed.

2. Will additional cleanups be needed when the Agency releases the cancer dioxin reassessment results?

Dioxin-contaminated sites cleaned up based on the 2012 non-cancer RfD are not expected to need additional cleanup when a new EPA cancer toxicity value for TCDD is published in EPA's Integrated Risk Information System (IRIS). This is because we anticipate that dioxin cleanup levels

based on the 2012 non-cancer RfD will be within the cancer risk range currently used by EPA's Superfund cleanup program. The status of EPA's dioxin cancer reassessment is described on this page."

Consistent with this Guidance, since 2012, cleanup levels for dioxins/furans at other sites in the United States have been developed using noncancer risks. Figure 1 below summarizes some cleanup levels that have been identified since EPA finalized the RfD for TCDD. As indicated in Figure 1, EPA has identified the following cleanup levels for dioxins/furans TEQ in soil: values ranging from 0.68 µg/kg to 0.82 µg/kg for TEQ for areas with recreational use (Figure 1 green bars); and cleanup levels ranging from 0.6 µg/kg to 2 µg/kg for areas with non-residential use (Figure 1 blue bars). These cleanup levels are all at least ten-fold higher than those derived by the agencies for the MPTP Site and presented in the ESD.



To be consistent with EPA guidance, the dioxin/furan cleanup levels should be derived using the RfD and noncancer risk estimates. Table 5 below shows SSCLs based on the noncancer risk using the 2012 EPA RfD and the updated exposure parameters used by DEQ in Attachment B. The lowest SSCL is for construction workers. This value is 0.5 µg/kg for both the ingestion pathway and for all exposure routes combined. To be consistent with EPA guidance, the ESD should *increase* the dioxins/furans soil cleanup level from 0.2 µg/kg to 0.5 µg/kg, rather than decreasing it to 0.04 µg/kg.

Table 5. Noncancer Dioxins/Furans Soil SSCLs

	Dioxins/Furans (TEF) Noncancer SSCL				
	Ingestion	Dermal	Vapor Inhalation	Particulate Inhalation	All Routes
Recreational (jig/kg)	1.9	36	1,500	2,100,000	1.8
Contribution to HI (%)	95%	5%	0.12%	0.00008%	
Industrial (jig/kg)	1.4	11	150	210,000	1.2
Contribution to HI (%)	88%	11%	0.8%	0.0006%	
Construction (jig/kg)	0.5	5.2	180	260,000	0.5
Contribution to HI (%)	91%	9%	0.25%	0.0002%	

References for Specific Comment #1c:

USEPA 2012. Integrated Risk Information System (IRIS) U.S. Environmental Protection Agency Chemical Assessment Summary National Center for Environmental Assessment. File for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD); CASRN 1746- 01-6. Available at https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/1024_summary.pdf

USEPA 2018. Risk Assessment for Dioxin at Superfund Sites. Available at <https://www.epa.gov/superfund/risk-assessment-dioxin-superfund-sites#tefsteqs>

USEPA 2014. Site-Specific Preliminary Remediation Goals (Cleanup Goals) for the Tittabawassee River Floodplain Soil Tittabawassee River, Saginaw River & Bay Superfund Site in Michigan. Available at <https://semspub.epa.gov/work/05/914878.pdf>

USEPA 2012. Region 1 Record of Decision Centredale Manor Restoration Project Superfund Site North Providence, Rhode Island. Available at <https://semspub.epa.gov/work/01/521788.pdf>

USEPA 2013. Preliminary Remediation Goals (PRGs) for Dioxin in Surface Soil Proposed Strecker Forest Development Wildwood, Missouri. USEPA Region 7. Available at https://archive.epa.gov/region07/cleanup/strecker_forest/web/pdf/strecker_forest-prg-july-2013.pdf

USEPA 2012. Site Reassessment Report Route 66 State Park (formerly known as the Times Beach Dioxin Site) Eureka, Missouri CERCLIS ID. Tetra Tech for USEPA Region 7. Available at https://archive.epa.gov/region07/cleanup/route66_state_park/web/pdf/route_66_state_park_reassessment_report.pdf

USEPA 2014, 2018. Davisville Naval Construction Battalion Center, North Kingston, RI. Available at <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0101430>

USEPA 2016. Record of Decision Amendment American Creosote Works Inc. Superfund Site Winnfield, Louisiana (Winnefeld, LA Region 6) 2016. Available at <https://semspub.epa.gov/work/06/100001030.pdf>

d) Specific Comment #1d – DEQ Failed to Account for Reduced Relative Bioavailability of Dioxins/Furans and PAHs in Soils.

In 2010, EPA issued a literature review of studies that examined the relative bioavailability (RBA) of dioxins in soil and concluded that “[c]ollectively, at this time these results support the conclusion that the RBA for dioxin in the soils evaluated in these studies is less than, and likely to be substantially less than 100%....” Nevertheless, EPA found that available data were inadequate to support a default value less than 100% that could be applied to all contaminated sites.

In 2015, EPA issued guidance for conducting site-specific studies of soil dioxin/furan RBA. The RBA of weathered dioxins/furans at an old site like MPTP is expected to be quite low. The potential impact of this factor on cleanup levels is significant. For example, if the RBA for dioxins/furans is 40% instead of the 100% assumed by DEQ, the cleanup level would change. The weathered material would have a cleanup level that is 2.5 times higher (less stringent) than the level that DEQ proposes to use in the ESD. Due to the potentially significant impact of this factor on the scope and extent of remediation, the MPTP dioxins/furans cleanup levels should not be revised without first assessing the relative bioavailability, following EPA guidance. AR requests that DEQ perform such an evaluation, and provide proper documentation in the final ESD.

Similar to dioxins/furans, numerous studies have provided evidence to reduced RBA for soil PAHs with a wide range of reported values and study methods (Ruby et al. 2016). Ruby et al. provide guidance for study design, and a site-specific study should be conducted prior to any changes in the MPTP soil PAH cleanup levels.

References for Specific Comment #1.d:

Ruby MV, Lowney YW, Bunge AL, Roberts SM, Gomez-Eyles JL, Ghosh U, Kissel JC, Tomlinson P, Menzie C. 2016. Oral Bioavailability, Bioaccessibility, and Dermal Absorption of PAHs from Soil-State of the Science. *Environ. Sci. Technol.*, 50:2151-2164.

USEPA 2010. Final Report Bioavailability of Dioxins and Dioxin-Like Compounds in Soil. Prepared for: U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation, Environmental Response Team – West Las Vegas, NV 89119. <https://www.epa.gov/superfund/risk-assessment-dioxin-superfund-sites>

USEPA 2015. Soil Dioxin Relative Bioavailability Assay Evaluation Framework. OSWER 9200.2-136. <https://www.epa.gov/superfund/risk-assessment-dioxin-superfund-sites>

2. Comment on Significant Difference #2 – Dioxin in Treated Soils from Land Treatment Unit (LTU) Offloads.

The ESD states that soil cleanup levels for dioxin were not achieved for soil treated at the Land Treatment Unit (LTU), and proposes to require soil containing dioxin to be managed on-site in a new 9-acre Corrective Action Management Unit (CAMU) that complies with applicable requirements under the Resource Conservation and Recovery Act (RCRA).

The ESD assumes this change will not fundamentally alter the approach, performance or cost of managing soils because the 1993 ROD called for surface grading and revegetation or covering with suitable soil. However, in addition to a clean soil cover, the CAMU is proposed to include a waterproof plastic barrier, among other things, which would unnecessarily increase costs, as such a barrier is not required to protect against human exposure to soil above cleanup levels if dioxin/furan cleanup levels were derived following EPA's 2012 protocols discussed above (*see* Specific Comment #1c above).

3. Comment on Significant Difference #3 – Management of Soils to Mitigate Potential Leaching of Pentachlorophenol (PCP) from Soil to Groundwater.

The 1993 ROD did not address nor establish remedial action goals for management of soils at, or near, the ground surface containing concentrations of PCP that are below the criteria for human health exposure, but high enough to potentially impact groundwater via leaching of PCP. Restoration of groundwater quality is not a remedial goal for the MPTP Site, as groundwater is not used for water supply, and residential use of the Site is prohibited. Further, groundwater extraction and treatment are key components of the Site remedy that will remain in place indefinitely if the 1 ug/L PCP performance standard in groundwater is not achieved.

As identified in the ROD, the point of compliance for organic contaminants in groundwater is at the waste management area boundary (i.e., the edge of the excavated area) and the south bank of Silver Bow Creek. If the groundwater system is not effective to contain water within these boundaries, then the groundwater system should be improved to provide for effective capture of residual PCP and other organics in groundwater beneath the Site. However, AR has not seen evidence demonstrating that the groundwater system is ineffective or that it requires improvement.

Based on an analysis provided in Attachment C to the ESD, the agencies are proposing to lower the concentration of PCP in soils that requires management to 2,000 ppb – a significant reduction from the 34,000 ppb required under the 1993 ROD and the 7,000 ppb level that would be required based on the ESD's updated human exposure risk evaluation. The ESD states that this change would not fundamentally alter the approach, performance, or cost of managing soils because the 1993 ROD incorporated a component of surface grading and revegetation or covering with suitable soil. The agencies have not provided a detailed cost analysis (e.g., the volume of saturated and unsaturated soils that would be excavated and placed in the CAMU) that

supports the agencies' cost conclusion. Moreover, in addition to soil in the LTU that may be above the lowered cleanup criteria, this change also could require excavation of additional soils in areas outside the LTU, increasing the overall amount of soil that needs to be excavated/managed in the CAMU long-term.

The additional soil removal cost is likely to result in little or no improvement in remedy protectiveness, as it is unlikely to result in achieving the 1 ug/L PCP standard in groundwater beneath the Site, and institutional controls are already in place to prevent use of Site groundwater for domestic use. Furthermore, residual contamination remaining beneath the Interstate and in soils placed within the CAMU is likely to contribute additional PCP concentrations in groundwater at the Site (see comments on Attachment C, below).

The proposed excavation of additional soil, with redispersion in a CAMU on Site, will not prevent off-site migration of contaminated groundwater into the BPSOU (if the groundwater extraction and treatment system is taken offline), or improve the protectiveness or the groundwater remedy. Regardless of whether the proposed work is conducted or not, it will be necessary to operate and maintain the on-site groundwater extraction and treatment system for the foreseeable future, indefinitely, to effectively capture and treat Site groundwater, and to prevent off-site migration of contaminated groundwater into Silver Bow Creek, BPSOU, and points downstream.

The Attachment C evaluation needs to consider other on-site sources of groundwater contamination. The remaining sources include at least material beneath the Interstate and the source within the [CAMU](#). AR further suggests that DEQ implement the planned remedy for the Interstate area, and assess the extent to which the selected remedy reduces PCP concentrations in soils, before deciding whether it is necessary to change the remedy action levels, as proposed in the ESD.

a) Specific Comment # 3.a – Comments on Attachment C to the ESD.

Based on the review of Attachment C, which uses the New Jersey SPLP guidance and site-specific data, it appears (but is unclear) that the site-specific dilution-attenuation ratio in the excel model was not modified from 20 to 79. By applying the site-specific dilution-attenuation ratio of 79, the appropriate removal standard would be 0.55 mg/kg. Either removal standard has the potential to notably increase the size of the CAMU, as well as the cost of the remedy. AR requests that DEQ update Attachment C to use the actual DAF value, and re-evaluate the cost of the proposed work based on the corrected values.

If removal is guided by the appropriate cleanup thresholds, additional source material will remain under the Interstate and within the CAMU. A CAMU with a waterproof plastic barrier will have a percolation rate; and a rate of from 1-3% of precipitation may be within the design specifications of this barrier. The CAMU source needs to be considered appropriately in the ESD.

Finally, the parameters in the DAF calculation are difficult to track. AR has the following questions, which it requests that DEQ address in preparing any revised proposed and final ESD:

1. Is the assumption that 10% of precipitation infiltrates to recharge groundwater appropriate for the unlined portions of the Site? This likely is too low.
2. Is the hydraulic conductivity of 100 ft/day appropriate? Specific reference is not provided.
3. Is the hydraulic gradient appropriate? The excel model references the RI, which was prior to putting the groundwater capture system in place, and current monitoring. Which was used?
4. Are the aquifer area and mixing depth for the DAF appropriate? Calculations were not provided.

4. Comment on Significant Difference #4 – Clarification Regarding Future Land Use.

The 1993 ROD indicated residential use would be restricted, anticipated recreational use as the likely future land use, and used recreational exposure via “the most susceptible exposure pathway” at a 1×10^{-6} cancer risk level as the basis for soil cleanup levels. The ROD indicated that these soil cleanup levels would be protective of industrial use exposure (total risk for PCP, dioxins/furans, and cPAHs of 2.0×10^{-5} risk) and did not restrict future industrial use despite the higher risk level.

The ESD clarifies that future residential land use will be prohibited and updates the soil cleanup levels to be based on industrial exposure at a 1×10^{-6} risk level, a change that is inconsistent with the statement in the ROD that cleanup levels based on recreational exposure are also protective for industrial exposures. $\Sigma \epsilon \epsilon$ Specific Comment #1 above for discussion of the change in industrial use risk level. The ESD appears to be based on a misunderstanding of the 1993 ROD requirements, and AR asks the agencies to reconsider this change after reviewing the ROD.

5. Comment on Significant Difference #5 – Capping, Engineering, and Institutional Controls for Soils.

The ESD updated the scope of engineering and institutional controls to include construction of a CAMU rather than “surface grading and revegetation or suitable soil cover” to manage treated soils offloaded from the LTU. The draft ESD also requires incorporation of additional soils from outside the LTU into the CAMU if they exceed the lowered dioxin and PCP cleanup levels. The ESD acknowledges that these changes alter the scope and cost of the

selected remedy in the 1993 ROD. The ESD concludes that the cost impact of adding the CAMU would likely be small (i.e., unlikely to make the remedy exceed 5% of the costs included in the ROD – *see* last sentence of ESD Section 3.2).

The ESD does not present the information necessary to understand the cost impact or benefit of constructing a CAMU in the manner proposed by the agencies. Further, detailed information to support the calculated volume of additional soil volume that may be generated by the lowering of soil cleanup levels are not provided. The ESD should be updated and revised to include details of the agencies' cost / benefit analysis that supports the decision to require a CAMU rather than grading and revegetating the Site as described in the ROD (*see also, e.g.,* General Comment #3). AR may have further comments after that proposed work is complete.

EMAIL T

From: [REDACTED]@nremontana.com <[REDACTED]@nremontana.com>
Sent: Tuesday, March 10, 2020 5:00 PM
To: [REDACTED] <[REDACTED]@mt.gov>
Cc: [REDACTED] <[REDACTED]@gmail.com>
Subject: [EXTERNAL] MPTP ESD comments

March 10, 2020

[REDACTED]
DEQ Project Manager
P.O. Box 200901
Helena, MT 59620-0901

Subject: [REDACTED] comment on DRAFT FINAL Explanation of Significant Differences Montana Pole and Treating Plant Site October 2019

Dear [REDACTED],

CTEC presents these comments on the draft Explanation of Significant Differences (ESD) for the Montana Pole and Treating Plant Site (MPTP). We provide both general and specific comments. General comments present our opinion on the overall plan provided in the ESD. Specific comments are edits or changes we recommend to specific language in the document. Thank you for DEQ's consideration of our opinion and recommendations.

Regards,



[REDACTED]

General Comments

1. [REDACTED] agrees with the ESD plan for containing residually contaminated soils in an on-site repository with the following recommendations.

First, we would like to make clear that given hindsight we believe that the selected remedy for the MPTP should have selected a method such as fungal bioremediation that is likely capable of significantly reducing dioxin in soil. The 1993 Record of Decision (ROD) also selected a remedy which neglected to consider the leaching to groundwater pathway for pentachlorophenol (PCP) in soils. Soils which were treated biologically on the land treatment unit (LTU) have residual PCP which can impact groundwater. However, given the current status of dioxin and PCP contaminant levels we agree that handling the contaminated soils in a capped repository Corrective Action Management Unit (CAMU) is appropriate.

We have some concerns that DEQ anticipates that the repository CAMU will not require a liner and leachate collection system. The ESD suggests that the aquifer in the area is institutionally controlled by a controlled groundwater area (CGWA) and impacts to groundwater from the repository are therefore less of a concern. The CGWA does not change the fact that the repository must not be a perpetual source of contaminants to the aquifer. The ROD goals for groundwater are to attain cleanup levels at groundwater points of compliance. Eventually the groundwater pump and treat system will be shut down. At that time it will be critical that the repository not be an ongoing source of PCP contamination. Additionally, it is the community's desire that perpetual sources of contamination be removed or remediated to the extent practical.

The ESD estimates that the repository cap will have a 40 mil HDPE liner, a geocomposite drainage net, and an earthen, vegetated engineered cover. The ESD states that the liner will be covered with an "earthen engineered cover that will prevent photodecay." Regardless of the cover, plastic liners do decay. Generally, the lifespan of HDPE is from 100 years to over 400 years for plastic which is buried at cooler temperatures (Koerner et al. 2005; Rowe and Sangam 2002). The operation and maintenance (O&M) plan for the CAMU should include funding and monitoring for eventual replacement of the liner.

2. The argument presented in the ESD that the changes proposed do not fundamentally change the remedy in the 1993 ROD does not match our interpretation of the ROD.

In regards to the presence of residual dioxin and PCP soil contamination and need for the repository CAMU, the ESD states "these changes do not fundamentally alter the basic features of the remedy selected in the 1993 ROD." We disagree. The 1993 ROD remedy as understood by the public is that soils would be treated such that unlimited recreational and industrial user contact would be possible and that most of the site could be redeveloped for these uses. The 1993 ROD also does not consider the perpetual risk of leaching to groundwater from residual contamination.

The ESD provides the following statements as evidence that the agencies anticipated that a capped repository may be necessary:

"Biological land treatment is not expected to achieve the degree of treatment provided by incineration; however, it is anticipated that allowable final contaminant levels will be achieved. Design studies would be utilized to determine achievable treatment efficiencies and identify any additional remedial actions which may be necessary in conjunction with biological land treatment." Page 9.

"The ARARs identification section of the 1993 ROD did discuss additional ARARs that may be invoked should treatment not meet cleanup standards, indicating anticipation by the agencies of this circumstance." Page 9.

The 1993 ROD only mentions capping for alternatives that were not selected. In fact, the ROD states for Alternative 3 which was not selected, "Capping under Alternative 3 is subject to deterioration over time and requires long term maintenance. Containment and reliance upon engineering and institutional controls to protect human health and the environment do not provide the degree of permanence that removal and treatment of contamination does."

The fact that the 1993 ROD includes RCRA Land Disposal Restriction ARARs in an appendix

doesn't change our opinion. The appropriate place for a ROD to identify remedy components is in the Selected Remedy and Statutory Determination sections.

In fact, the 1993 ROD Statutory Determination states "Other alternatives considered, including containment, capping and partial excavation, did not offer similar prospects for effectiveness or permanence." Underline added.

The public expected that the chosen alternative would remediate soils and allow most of the site to be redeveloped. It does a disservice that the ESD include these statements that reflect an 'I told you so' attitude. We do not disagree that the plan proposed in the ESD is appropriate given what we know today about the site contaminants and efficacy of the ROD selected remedy. And we are not requesting that a ROD amendment be undertaken at this point, because we believe a ROD amendment would reach the same conclusion as the ESD. We are disagreeing that the 1993 ROD anticipated that soils would not meet cleanup levels and a repository/CAMU would be required. We believe the ESD should acknowledge this.

3. We are pleased that soil cleanup levels have been updated using current methods and a more protective cancer risk level.

The ESD provides revised site specific soil cleanup levels for recreation, industrial, and construction worker exposures. Also included are soil cleanup levels which consider leaching of PCP to groundwater. The revised cleanup levels were recalculated using updated exposure parameters and toxicity criteria.

The community's expectation is that those portions of the site outside of the repository CAMU will eventually be cleaned to allow redevelopment and unlimited exposure for recreational or industrial uses. The ESD will ensure that surface soil at the site is cleaned to these revised lower levels or soils which have residual contamination will be contained in the repository CAMU. This is an improvement in safety. The revised cleanup levels will further protect people who use the site in the future over those selected in the 1993 ROD.

4. The evidence in the PCP leaching to groundwater analysis suggests a more conservative soil cleanup level.

Attachment C (the PCP leaching to groundwater analysis) is a multiple lines of evidence approach to determining the soil PCP cleanup level which will protect groundwater from leaching. Some of the lines of evidence which were used to select a higher, less conservative soil cleanup level are problematic

Line of evidence #1 uses data from monitoring wells MW-A-95, MW-09, and GW-09 and suggests that these wells should show an impact from backfilled soils if that soil was leaching PCP to groundwater. However, it is not clear the analysis considered the dilution capability of the aquifer between the well intake and the source or considered whether PCP leaching to the groundwater has reached equilibrium. Also, two of these wells are shown on Exhibit 2 as "PCP generally less than 1 µg/L." This does not give confidence that the groundwater cleanup standard of 1 µg/L will be met.

Line of evidence #2 compares an area with soils with elevated PCP to water quality in monitoring wells a long distance downgradient. The monitoring wells are way too far away and are subject to mixing with Silverbow Creek water to provide a basis for measuring groundwater contamination by these small areas of PCP contamination.

We believe the best evidence is provided by the NJ SPLP leaching model and LTU leachate data which suggest a PCP cleanup level as low as 0.56 mg/kg is appropriate. These methods are most appropriate for evaluating the soil cleanup level because they are not subject to hydrogeological heterogeneities and mixing that the site monitoring well water quality data is. The groundwater cleanup level should be met, if possible, at the nearest groundwater to the source.

We recommend that the final soil leaching to groundwater cleanup levels be based on a thorough examination of the NJ SPLP leaching model and LTU leachate data, or additional SPLP data and modeling, given these considerations.

5. █████ would like additional information on the future ESDs or ROD amendments suggested.

The ESD states that groundwater points of compliances will be addressed in a future ESD pertaining to groundwater and surface water and soil beneath the treatment building and beneath the interstate highway will be addressed in a future ESD or ROD Amendment. CTEC would like further information in the near future on these proposed changes to the remedy.

Specific Comments

1. “Figure 1” and “figure two” are referenced several times in the main body of the ESD but are not included.

2. Section 3.3 states “This ESD changes the 1993 ROD by indicating that soils at or near the ground surface, with PCP concentrations greater than 2,000 jig/kg, will be placed and managed in a CAMU...” The meaning of “soils at or near the ground surface” should be clarified. The reasons for selection of the maximum excavation depth for soils exceeding the cleanup level should be given and the basis for the depth as provided for in the ROD.

3. The table in Attachment C, section 3.0 Summary of Lines of Evidence shows range of soil PCP concentration for #5 to be 14.0 to 26.9 but the text above states “LTU soils ranged from 14 to 34 mg/kg.” It also is not clear how these soil concentrations which resulted in a median leachate PCP concentration of 25 µg/L is safe when the ROD groundwater cleanup level is 1 µg/L.

Attachment C, page 8 states “Details related to all calculations and assumptions are provided in the final data gap report (Tetra Tech 2017) and are also summarized in Exhibit 3.” Exhibit 3 is a monitoring map.

References

Koerner, R.M., Hsuan, Y.G., and G.R. Koerner. Geomembrane Lifetime Predictions: Unexposed and Exposed Conditions. Geosynthetic Institute, Folsom, PA, GRI White Paper #6.

Rowe, K.E. and H.P. Sangam. 2002. Durability of HDPE geomembranes. *Geotextiles and Geomembranes*, 20, pp 77-95.

EMAIL U

From: [REDACTED] <[REDACTED]@nerglobal.com>

Sent: Tuesday, March 10, 2020 4:27 PM

To: [REDACTED] <[REDACTED]@mt.gov>

Cc: [REDACTED] <[REDACTED]@nerglobal.com>

Subject: [EXTERNAL] Submission of Public Comment Period on the Explanation of Significant Differences (ESD) Report for the Montana Pole and Treating Plant Site

[REDACTED]

Project Manager

Montana Department of Environmental Quality

[REDACTED]

Comments from [REDACTED]

RE: Public Comment Period on the Explanation of Significant Differences (ESD) Report

Montana Pole and Treating Plant Site (February 2020)

Dear [REDACTED]

[REDACTED] respectfully submits this Public Comment – inclusive of its appendices – for the consideration of the Montana Department of Environmental Quality [REDACTED] is a remediation company specializing in the treatment of petroleum contaminated soil and sludge by use of mobile thermal desorption equipment. [REDACTED] offers thermal treatment equipment, site services and expertise to deliver solutions for onsite (ex situ) remediation projects. [REDACTED] utilizes its thermal desorption units to remediate soils and other materials across the United States, including six previous NPL ‘Superfund’ sites. [REDACTED] maintains the largest fleet of mobile thermal soil remediation systems in North America and, with its extensive experience, competes on a global scale.

For over 25 years, [REDACTED] has provided site remediation services for hundreds of projects and treated millions of tons of impacted soil. [REDACTED] maintains a current fleet of 5 technologically advanced systems, including four Direct-Fired Thermal Desorption Systems and one Indirect-Fired system. [REDACTED] can treat several hundred thousand tons of soil annually with any one of its five systems. [REDACTED] routinely works under strict USEPA guidance and requirements for safety, quality of treated soils, noise and air emissions metrics. [REDACTED] thermal desorption process is categorized as a Best Demonstrated Available Technology (BDAT), allowing [REDACTED] to carry a coveted, “Environmental Technology Verification” document, including an ISO 14034 accreditation.

██████████ offers a cost effective and guaranteed solution bringing certainty for clients. ██████████ is capable of performing all phases of excavation, soil preparation, thermal treatment, back-filling and site restoration. With experience on projects from the Arctic to the Tropics, we can deliver services regardless of the climate.

DIRECT-FIRED THERMAL DESORPTION (DTD)

Direct-Fired Thermal Desorption soil remediation systems are designed to remediate mineral soil contaminated with organic compounds including petroleum hydrocarbons (crude oil and refined products), chlorinated solvents, pesticides, PCB's, PAH's etc. These products are separated from soil by volatilization, then destroyed via thermal oxidation ██████████ completely recycles the soil giving the client "Clean Dirt, No Doubt!".

The major components of Direct-Fired systems consist of a control room, material feed system with belt weigh scale, rotary kiln, baghouse and thermal oxidizer.

██████████ DIRECT THERMAL CAPACITY

Today Nelson owns and operates four mobile thermal desorption system. These mobile systems are very robust and can process contaminated soil at different rates (all rates are estimated). A process description and flow diagrams for each system type is located below.

- The Nelson RS-945 our largest direct fired system has a production rating from 60- 70 tons per hour. This system is capable of temperatures in the primary treatment unit of up to 1100 degrees F. or 590 degrees C. and the secondary air pollution control an oxidizer with retention time of up to 2 seconds.
- The Nelson RS-45 direct fired system has a production rating of from 40-50 tons per hour. This system is capable of temperatures in the primary treatment unit of up to 1100 degrees F. or 590 degrees C. and a secondary retention time of up to 2 seconds.
- The Nelson RS-40 direct fired system has a production rating of from 30-40 tons per hour. This system is capable of temperatures in the primary treatment unit of up to 1100 degrees F. or 590 degrees C. and a secondary retention time of up to 1.5 - 2 seconds.
- The Nelson RS-20 direct fired system has a production rating from 15-25 tons per hour. This system is capable of temperatures in the primary treatment unit of up to 1100 degrees F. or 590 degrees C. and a secondary retention time of up to 1.5 seconds.

TREATMENT OF DIOXIN-IMPACTED SOILS

NELSON has successfully completed multiple projects involving the substantial elimination of Dioxins from treated soils. Collectively, NELSON has removed Dioxins from approximately 180,000 tons of soil. Over all NELSON has treated over 5 Million tons of contaminated soils

SOIL QUALITY

Following thermal treatment process, the measurable quality of soils is similar to (or better than) undisturbed, surrounding soils. Post-treatment soils support vegetation well and tend to exhibit enhanced bioavailability of nutrients due to increases in surface area (of soil particles). This is documented by a North Dakota State University study examining soils treated [REDACTED]. This peer-reviewed and published article quantifies that post-treatment soils support rehabilitation of agricultural lands following onsite thermal remediation.

Treated soils further exhibit exceptional geotechnical properties due to their uniform nature and controlled moisture content (controlled and adjusted during the cooling/rehydration/discharge phase of thermal processing). Treated soils are homogenized and generally devoid of rocks and foreign debris, as these have already been removed during the treatment process. At most previous projects, treated soils have met compaction and stability requirements for subsequent civil engineering applications.

CONCLUSION

As a recognized leader in onsite, ex situ thermal treatment of soils impacted by Dioxins, [REDACTED] respectfully requests that the use of thermal soil remediation be further considered as retained as an approved “selected remedy” for future deployment at the Montana Pole and Treating Plant Site [REDACTED]
[REDACTED]

Regards

[REDACTED]

Corporate Director of Business Development

EMAIL V

From: [REDACTED] <[REDACTED].com>

Sent: Tuesday, March 10, 2020 5:31 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment Montana Pole Plant

I would like the following to be addressed. Please consider this public comment pursuant to the public comment period for Montana Pole Plant. I have also attached documents that I would like considered as public input on Montana Pole Plant.

[REDACTED]

Dioxin has been and continues to be released from Montana Pole Plant into Silver Bow Creek.

How much has been released from the Montana Pole Plant?

Where is it now?

What will be done to remediate it?

How much contamination has been released from under the Interstate?

Where is it now?

What will be done to remediate it?

What is the time table for addressing the contamination under the interstate?

How significant a threat to human health and the environmental health of Silver Bow Creek is the dioxin that has been released?

Has any attempt been made to assess the effects of the released dioxin?

Is not, why not?

When will water quality standards be met for the Pole Plant?

Is there enough money to operate the water treatment plant for as long as it is need?

ATTACHMENT V.1

From: [REDACTED] <[REDACTED].com>

Sent: Tuesday, March 10, 2020 5:31 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment Montana Pole Plant

Submitted by: [REDACTED]

In several ways the Montana Pole Plant is one of Butte's most dangerous Superfund sites. Superfund in Butte will never be successful unless this threat to public health and our environment is cleaned up. Any talk of reuse of this land is premature until the threat to Butte's health and environment from the Pole Plant is eliminated. Any talk of restoring Silver Bow Creek is premature until the threat from the Pole Plant is removed. A few months ago, MDEQ announced that it was abandoning bio-remediation of dioxin at the Pole Plant in favor of capping and institutional controls.

The "cleanup" of the Montana Pole Plant in terms of dioxin has been and is very problematic:

1. Bio-remediation has been abandoned in favor of another waste-in-place, i.e. threat left in place remedy of capping. This is contrary to Superfund policy that emphasizes treatment over containment and emphasizes the reduction of the toxicity, volume and mobility of contaminants. Butte is to be left with another dead zone that will be off limits to development.
2. The state will run out of money before the remedy is finished and the state refuses to specify from where additional funds will come. All we are given are paternalistic assurances that all is ok.
3. The water treatment plant is not meeting water quality standards.
4. MDEQ has obfuscated regarding future land use of the site making local government planning impossible.
5. MDEQ has no plan in place to address the contaminants under the interstate.
6. The Cost of Remedy Superfund balancing criteria has been totally misapplied by MDEQ.
7. Stormwater runoff controls through the site appear to be problematic.
8. Community outreach activities by MDEQ have been abysmal.
9. MDEQ has ignored the mandates of federal and state law regarding following the Precautionary Principle and the Principle of Pollution Prevention.

But I want to focus on the health threat posed by dioxin.

1. Current dioxin discharge from the Montana Pole Plant into Silver Bow Creek does not meet water quality standards.
2. The water quality standards set by the ROD for Montana Pole Plant are very permissive and less restrictive/protective than national standards. So meeting these lax standards does not protect human health and the environment. But even these lax standards are not being met.
3. The current ground water treatment system in place at Montana Pole Plant discharges dioxin into Silver Bow Creek at 100 times the lax water quality standards.

4. This current discharge at 100 times the permissive water quality standards will continue for decades.
5. MDEQ has decided not to adhere to the cleanup standards in the ROD for Montana Pole but will waive them. MDEQ, without full investigation, has abandoned bio-remediation.

As I said, the current proposal is to leave dioxin in place at the site. Why is this so problematic? Because dioxin is highly toxic and there are no safe levels of exposure to dioxin. The current waste left in place solution is unlikely to protect present and future generations from exposure to the dioxin at the Pole Plant. The MDEQ proposed solution is unlikely to protect human health and the environment.

This paper makes the following arguments:

- A. Dioxin is a deadly carcinogen that produces severe and serious health effects in addition to cancer.
- B. Contrary to the goal of Superfund to treat toxic waste instead of leaving it in place and to reduce the toxicity, mobility and volume of contaminants, MDEQ plans to cap the dioxin in place.
- C. The proposal by MDEQ to leave dioxin in place is not protective of human health and the environment because capping has serious problems.
- D. Because dioxin is mobile at the Pole plant, the caps will not be protective.
- E. The use of institutional controls at the site is very problematic. Problematic institutional controls threaten the release of dioxin at the Pole Plant
- F. The balancing criteria of cost has been misapplied by MDEQ resulting is leaving an unacceptable dioxin threat in place.
- G. MDEQ has failed to apply the legally mandated principles of Pollution Prevention and the Precautionary Principle to the threat posed by dioxin at the Pole Plant.

Dioxin at the Montana Pole Plant still presents a significant, unremediated threat to human health and the environment. MDEQ has allowed this condition to go on for years while misinforming the public as to the protectiveness of the remedy.

There are no safe levels of exposure to dioxin. An EPA report in 2012 concluded that, after reviewing mounds of evidence, there are potentially serious health effects at ultra-low levels of exposure to dioxin. Dioxin is a known carcinogen. (World Health Organization). Other scientific studies have linked dioxins to disrupted hormones, reproductive damage such as reduced sperm counts, neurological effects in children and adults, immune system changes and skin disorders. (EPA, Environmental Health News, National Institute of Environmental Health Sciences) Studies have shown serious health effects at parts per trillion exposure to dioxin. No wonder dioxin is considered to be one of the most toxic substances known to human beings.

The EPA lists the following as health risks associated with dioxin.

Dioxins are highly toxic and can cause cancer, reproductive and developmental problems, damage to the immune system, and can interfere with hormones.

The World Health Organization states: “Dioxins are highly toxic. They belong to the so-called ‘dirty dozen’—a group of dangerous chemicals known as persistent organic pollutants. Dioxins are of concern because of their highly toxic potential. Experiments have shown they affect a number of organs and systems.” (*Dioxins and their effects on human health*, WHO, October 2016) “Dioxins are a group 1 human carcinogen.” (Smith and Lpiperio “Invited Commentary: How Do the Seveso Findings Affect Conclusions Concerning TCDD as Human Carcinogen?,” *American Journal of Epidemiology*, June 2001.)

Dioxins also tend to accumulate in the body and are not easily expelled.

Additional References: ATSDAR, December 1998, National Toxicology Program January 2001 and International Agency for research on Cancer, 1997

The tragic consequences of exposure to dioxin have been verified by the effects of Agent Orange on service personnel, Times Beach in Missouri and Love Canal in New York.

Dioxin is Mobile at the Montana Pole Plant

This mobility compromises the protectiveness of any proposed caps at Montana Pole Plant. This mobility is demonstrated by technical/scientific literature on the subject as well as statements by EPA and MDEQ specifically regarding the Pole Plant.

Dioxin is mobile in soils such as those at the Montana Pole Plant. The ROD for Montana Pole itself says that it is possible for dioxin in soils to migrate. (Page 14) There are present in the Montana Pole Plant soils co-contaminants that can mobilize dioxin. In addition, the caps as presently proposed will not prevent surface water and other contaminants from leaching down and mobilizing dioxin. Given the problems of caps with bio-irrigation, advection, desiccation, erosion, weathering, bio-intrusion and stabilization, the dioxin in the soil will be mobilized. Only in a pure lab setting does dioxin remain non-mobile. Certainly the Montana Pole Plant is not a pure lab setting. (See: Dioxin reservoirs in southern Viet Nam--A legacy of Agent Orange by Divernychuk, et al in *Chemoshpere* 47 (2002) 117-137. Similar findings are reported in the following:

- 1. Soil-Plant Transfer of Polychlorinated Dibenzop-dioxins and Dibenzofurans to Vegetables of the Cucumber Family (Cucurbitaceae)** Anke. Huelster , Jochen F. Mueller , Horst. Marschner *Environ. Sci. Technol.*, 1994, 28 (6), pp 1110–1115 **DOI:** 10.1021/es00055a021 Publication Date: June 1994 (Article: Indicates that dioxin is mobilized in soils as the result of plant activity. Given that there will only be a 16 inch cap over dioxin contaminated soils and the cap will have vegetative cover, the vegetative cover will absorb dioxin and bring it to the surface.)
- 2. Sorption of 2,3,7,8-tetrachlorodibenzo-p-dioxin to soils from water/methanol mixtures** Richard W. Walters , Annette. Guiseppi-Elie *Environ. Sci. Technol.*, 1988, 22 (7), pp 819–825 **DOI:** 10.1021/es00172a012 Publication Date: July 1988
- 3. Study by U.S. Dept. of Agriculture indicated that dioxin is only immobile in soils devoid of other organic material. If any organic co-solvents, as are present at the Pole Plant, are in the soil, mobility will occur.**

4. SUBSTANTIAL MIGRATION OF DIOXINS IN AGROCHEMICAL FORMULATIONS, Grant, Sharon, Mortimer, Munro, Stevenson, Gavin, Malcolm, Don and

Gaus, Caroline, The University of Queensland (National Research Centre for Environmental Toxicology (EnTox)), 39 *However, the presence of co-contaminants can act as transport facilitators for otherwise low mobility organic compounds (LMOCs) These results highlight that the paradigm of LMOCs being non mobile in soils should be considered carefully together with application specific and environmental factors which may have the ability to considerably change the predicted environmental fate of these chemicals.*

(This article supports the above mentioned study by the U.S. Department of Agriculture that if, as we find at the Pole Plant, co-contaminants are present, dioxin does become mobile in soil.

The point is that since the remedy for the Pole Plant was changed from one of active treatment to containment, co-contaminants that will make dioxin mobile in soil will be present.

5. Assessment of Dioxin Contamination at Sawmill Sites: A Report to the Ministry for the Environment by Tonkin & Taylor Ltd and SPHERE, Prepared for the New Zealand Ministry for the Environment

October 2008 (conclusions are similar to the one's I included in my earlier email to you today, i.e. that dioxin is mobile in both soil and water.

Also, data presented by the MDEQ at a CTEC meeting indicated that dioxin is present in the recovery trenches at the Pole Plant. If dioxin isn't mobile in soil at the Pole Plant, how did the dioxin get in the recovery trenches? Another point that was made at the CTEC meeting: MDEQ is in charge of the cleanup in Missoula of the White Pine Sash site. This site was a wood treatment facility similar to Montana Pole. The MDEQ acknowledges at this site that dioxin can be mobile in soils. Why not acknowledge the same at Montana Pole? Finally, the dioxin levels that we are now seeing in groundwater at the Montana Pole Plant were not supposed to have been reached until 200,000 years from now according to MDEQ. Why, if dioxin is not mobile, are we seeing dioxin now that we should not have seen for 200,000 years?

Caps are not Permanently Protective of Human Health and the Environment.

Capping dioxin contaminated soil will do nothing to treat the dioxin. Capping dioxin contaminated soil will not reduce the toxicity, mobility or volume of dioxin. Capping is not a permanent remedy. No wonder EPA recommends bioremediation and incineration as the best methods for treating the contaminants such as dioxin at wood treatment plant Superfund sites.

Problems with caps:

1. Metals can be remobilized through bio-irrigation. (Dueri, Sibylle, et. al., University of Laval, Quebec, "Modeling the Transport of Heavy Metals through a Capping-Layer: The case Study of the Flood Sediments Deposited in the Saguenay Fjord, Quebec.")
2. The long term efficacy of caps can be compromised by advection "related to consolidation, diffusion, chemical reactions, and the effect of . . . burrowing activity." (*Ibid.*)

3. Desiccation can cause cracking of the cap cover. (David Daniel, Professor of Civil Engineering, University of Texas, *Geotechnical Practice for Waste Disposal*)
4. The freeze-thaw cycle can produce changes in the structure and fabric of the cover and a way that increases hydraulic conductivity. (*Ibid.*)
5. Caps are difficult to construct correctly. (*Ibid.*)
6. Caps are difficult to maintain and repair. (*Ibid.*)
7. Erosion is a serious problem. (Jack Caldwell, U.S. Department of Energy, *Principles and Practice of Waste Encapsulation.*)
8. Biointrusion can compromise the effectiveness of the cap. (*Ibid.*)
9. Differential settlement of the cap can cause cracking. (Oweis and Khera, New Jersey Institute of Technology, *Geotechnology of Waste Management.*)
10. Caps require regular and often expensive repair. (*Ibid.*)
11. Stabilization of the cap is a problem. (*Ibid.*)
12. Caps present long-term subsidence and settlement issues. (*Ibid.*)
13. Because of their susceptibility to “weathering, cracking and subsidence” caps have limited long term utility. “Wind, rain, and generalized erosion over time can severely damage even a well-designed . . . cover.” (U.S. Department of Energy, Office of Environmental Management, “Remediation Technology Descriptions: Containment.”) See also: Merritt, Frederick (ed.) *Standard Handbook for Civil Engineers*, McGraw-Hill, New York.

The extensive use of caps as a cleanup method for Montana Pole Plant would do nothing to reduce the toxicity and volume and mobility of contaminants. Caps do nothing to clean up a site. The extensive use of caps as a cleanup method for Montana Pole Plant would not provide a permanent remedy. The extensive use of caps as a cleanup method for Montana Pole Plant would violate the Superfund mandate for treatment over containment. In short, the extensive use of caps for the Montana Pole Plant would not be protective of human health and the environment.

In addition to caps, the remedy for the Montana Pole Plant depends on institutional controls to keep the public from contacting the deadly dioxin at the Plant.

The Public should be concerned about too great a Reliance on Institutional Controls.

Institutional controls will provide no permanent protection from the dioxin at the Montana Pole Plant.

Institutional controls per se do nothing to reduce the mobility, toxicity, or volume of contaminants. Institutional controls do nothing to clean up a site. The institutional controls being considered by MDEQ for the Montana Pole Plant would seriously limit productive land uses. The extensive reliance on institutional controls is also contrary to the Superfund mandate of preference for treatment over restricted land use. Institutional controls do nothing to treat a site. The EPA’s own document “Rules of Thumb for Superfund Remedy Selection” states that the law mandates a clear preference for treatment over all other approaches. “EPA expects to use treatment to address the principal threats posed by a site. . . .” [40 CFR 300.430(a)(1)(iii)(A)].

The above document also notes: “Institutional controls. . .generally shall not substitute for more active measures. . . .” (pp. 12-13)

The EPA itself has found significant problems with institutional controls at its other sites. In an article entitled “EPA, Think Tank Studies Show Superfund Land-use Controls Flawed, December 10, 2001” which summarizes “Superfund Report via Inside EPA.com” by Resources for the Future, we find these conclusions, ***reached by the EPA itself***, which due to their significance, I will quote at length:

“EPA and environmental think tank studies have shown that the federal and state governments’ land-use restrictions at Superfund sites, known as institutional controls (IC), are seriously flawed, with an agency study showing the controls are not reliably implemented and the think tank report finding the controls are dramatically under-funded.”

“During a November 27 land use control summit, sponsored by the International City/County Management Association (ICMA), EPA officials and the Environmental Law Institute (ELI), outlined numerous shortcomings they have found with EPA’s IC monitoring and enforcement efforts nationwide. While EPA released the results of a study showing EPA has failed to ensure Superfund ICs are reliably implemented, and ELI study indicates that EPA’s ICs are dramatically under-funded.”

“Bruce Means, of EPA’s Federal Facilities Restoration and Reuse Office, told attendees that preliminary studies show that half of the ICs implemented under Superfund records of decisions (ROD) were mischaracterized. During a study of RODs conducted during 1999 and 2000, the agency found that half of the ICs established under RODs were not implemented as the agency had planned.”

“And Jay Pendergrass of ELI outlined the preliminary findings of ELI’s study of state’s IC programs, which showed that the programs are severely under-funded.”

“In a draft version of the report, Pendergrass found that state environmental programs are underfunded and as a result the sites allocate very little time on IC implementation. The funding and staffing shortfall ‘raises concerns about whether [ICs] are implemented as intended and [are] as protective as intended.’”

“An ICMA source agrees that EPA has serious problems with its IC program, saying that the agency has many RODs with vague or inconsistent references to such controls.”
(pages 1-2)

The greater the cleanup of the Montana Pole Plant, the more the site can be used productively. The less cleanup of the Montana Pole Plant, the less the site can be used for residences and recreational uses. Given the EPA’s admission that institutional controls have failed it in the past, it is amazing that the remedy planned by MDEQ for Montana Pole Plant calls for such extensive use of institutional controls.

Other Problems with Institutional Controls:

- a. There is a tendency not to implement institutional controls as time passes. Frequently institutional control mandates are not carried to completion.
- b. The effectiveness of institutional controls usually depends upon the ability, personnel and resources of the local government to implement. Often local governments do not have the personnel or resources to devote to the implementation and monitoring of institutional controls. Given the national administration's proposed cutbacks in Superfund allocations, resources will be increasingly unavailable on the national level to monitor implementation and effectiveness of institutional controls. Certainly the financial capacity of Butte's local government to implement and monitor institutional controls is greatly limited. Nowhere does MDEQ comprehensively address the above issue.
- c. "Institutional controls rely heavily on humans to implement, oversee, and administer them. It is human nature to ignore tasks that no one else seems to care about or where the purpose is not readily apparent. Residual hazardous substances are a classic example of a problem that is not readily apparent." ("Protecting Public Health at Superfund Sites: Can Institutional Controls Meet the Challenge?" Environmental Law Institute, p. 2)
- d. Although MDEQ must review the remedy every five years, the frequency of this review process may be insufficient to detect the failure of institutional controls.
- e. The use of education as part of the institutional controls strategy is a substantial part of MDEQ's approach to implementing institutional controls. Research of previous remedies under Superfund indicates that education programs fail to materialize.
- f. "In addition to the direct costs of implementing institutional controls, their use can impose substantial indirect costs on communities, property owners, prospective purchasers and developers by limiting the ways a site may be used. The burden of the restrictions on use of the site falls on the property owner and the community, with the owner reaping potentially lower profits from use of the property and the community receiving lower social benefits from the allowed uses than would have been possible if no restrictions existed." (ELI, *Ibid.*)
- g. Because the sites where institutional controls will be implemented will not be cleaned up and will present a continuing potential threat to human health, these sites will be off limits to development in perpetuity. It is difficult to see how the use of institutional controls meshes with the goals of the EPA's Superfund Redevelopment Initiative.
- h. It is impossible to determine future possible land uses for the site nor is it possible to predict unanticipated land uses. (See: "Linking Land Use and Superfund Cleanups: Uncharted Territory," by Probst, Hersh, Wernstedy and Mazurek, *Summary of Findings*, RFF, p. 1)
- i. "Institutional controls have more problems than just risk miscalculation. Breaches in the site because of future construction, or even animals may cause the control to fail. The lack of a required contingency plan, would not account for new remedies, new information, or failed institutional controls negatively impacts the effectiveness of the treatment. Institutional memory loss was well is an important factor. This memory loss occurs when a party decides to breach the original institutional control without its own knowledge. In fact, in the ICMA (International City/County Management Association) study, the majority of respondents (63%) said that breaches in the institutional controls on a site were highly or somewhat likely. Following up on that question, 30% of the respondents reported that no formal inspection schedule was set up to evaluate the site as

require by law.” (Erwin Tam, Environmental Science and Economics, UC Berkeley, “Analysis of Institutional Controls at California Superfund Sites.”)

- j. “Concern has been expressed about the long-term viability of institutional controls as a remediation tool. For example, they may be forgotten; enforcement agencies may not effectively review properties or land users’ actions; or land users simply may take their chances. Decision makers should weigh the full costs of such options, including capital costs, costs of long-term sampling and analysis, and costs of replacing equipment, as well as concerns about potential long-term risks associated with contaminants left in place, against the cost options that would remove the contaminants completely. Many local governments do not yet have the capacity and resources necessary to meet the challenges of long-term stewardship.” (“Understanding the Role of Institutional Controls at Brownfields Sites: Major Concepts and Issues.”)
- k. Because institutional controls leave large amounts of contaminants in place, institutional controls will have to be perpetual. Who is to say what anticipated land uses come up for an institutionally controlled area? For example, fifty years after the record of decision for Montana Pole Plant is implemented, the dioxin will still be there threatening human health and the environment, but will the will be there to restrict land uses in order to prevent the release of contaminants. “Institutional controls ‘work’ only if they are complied with. And while this is true of any site remedy, institutional controls require monitoring and enforcement over long time periods.” (“Linking Land Use and Superfund Cleanups: Unchartered Territory, Probst, et al., Resources for the Future Center for Risk Management.) Will the will to enforce institutional controls exist fifty to a hundred years in the future?
- l. Legal, social and political pressures limit the effectiveness of institutional controls. (*Ibid.*)
- m. The long-term effectiveness of institutional controls is unknown. “There has, however, been little investigation of what happens at sites on the National Priorities List (NPL) when land use plays a prominent role in the remedy selection process. There also has been little analysis of what institutions are involved in making land use decisions and maintaining land use restrictions over time. It is unclear what legal mechanisms are most effective, what institutions will be responsible for enforcing institutional controls, and who’s going to pay for these additional responsibilities. We need to be able to answer these questions if land use-based remedies are to be protective over the long term.” (*Ibid.*)

“Planners of long-term disposal systems have long recognized the difficulty of maintaining institutional control over property. . . .” (Jack A. Caldwell and Charles C. Reith, *Principles and Practice of Waste Encapsulation*, 1993, p. 35)

I would also make the argument that the Principles of Pollution Prevention and the Precautionary Principle, which are both part of federal and state law, demand that the dioxin be aggressively treated and not just covered up to exist as a perpetual threat in place to human health and the environment.

Cost of Remedy—A Criteria Misapplied by MDEQ.

MDEQ has totally misapplied this criterion. According to EPA, cost should not drive Superfund remedies. The way cost is supposed to influence Superfund decision making is that the determination is first made as to what plan of action will best protect human health and the environment and then the most cost-effective, i.e. efficient way of accomplishing this goal is selected. Preference should not be given to the cheapest remedy. With regard to the Montana Pole Plant, MDEQ has let cost considerations subvert the protectiveness of the remedy. This is a total perversion of the Superfund decision making process. Butte has, in large part because of cost considerations, had to settle for a below par remedy at Montana Pole Plant.

Precautionary Principle and Principle of Pollution Prevention: Definition and Scope

The essence of the precautionary principle is that government should act before harm to human health and the environment occurs from the releases of toxic substances. The precautionary principle “dictates that indication of harm, rather than proof of harm, should be the trigger for action.” (Sandra Steingraber, *Living Down Stream: An Ecologist Looks at Cancer and the Environment*, p. 270.) If there is a reasonable suspicion that harm to human health and the environment could occur from the release of a toxic substance, government should step in and fix the problem before it hurts people and the environment. The 1998 Wingspread Statement on the Precautionary Principle states: “When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.” Former EPA director Christine Todd Whitman stated: “policymakers need to take a precautionary approach to environmental protection. . . . We must acknowledge that uncertainty is inherent in managing natural resources, recognize it is usually easier to prevent environmental damage than to repair it later, and shift the burden of proof away from those advocating protection toward those proposing an action that may be harmful.” If there is a strong suspicion that something bad is going to happen, government has an obligation to stop it prior to its occurring. The precautionary principle is really grounded in old common sense sayings: “An ounce of prevention is worth a pound of cure.” “Better safe than sorry.” “A stitch in time saves nine.” “Look before you leap.”

The President’s Council on Sustainable Development supports the precautionary principle. The Council declared: “Even in the face of scientific uncertainty, society should take reasonable actions to avert risks where the potential harm to human health or the environment is thought to be serious or irreparable.” The American Public Health Association has passed a similar resolution concerning chemical exposure. (Resolution 9606)

The U.S. Court of Appeals for the District of Columbia Circuit upheld the EPA’s use of the precautionary principle in *Ethyl Corp. v. U.S. Environmental Protection Agency* (541 F. 2d 1, 6 ELR 20267 (D.C. Cir.), cert denied, 426 U.S. 941 (1967) This was the case which supported the banning of leaded gasoline by the EPA. The banning of lead additives to gasoline was an example of the precautionary principle in action. “The U. S. Court of Appeals for the D.C. Circuit upheld the U.S. Environmental Protection Agency’s decision to take a precautionary approach and ban lead anyway, even in the absence of scientific evidence adequate to demonstrate exactly what the risks from the lead were or what the benefits of removing it would be. As it turned out, banning leaded gasoline was the single most important contributor to the

virtual elimination of lead from air and from most children's blood.” (Charnley and Elliott, *Risk Versus Precaution: Environmental Law and Public Health Protection*, Environmental Law Institute, March 2002)

There is ample support for the precautionary principle from international organizations and treaties, to many of which the United States is a signatory, thereby creating a legal obligation. For example, the Rio Declaration from the 1992 United Nations Conference on Environment and Development, also known as Agenda 21, stated: “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.” The United States signed and ratified the Rio Declaration.

The precautionary principle is also part of the following: Ozone Layer Protocol, Second North Sea Declaration, United Nations Environment Programme, Nordic Council's Conference Declaration of October 18, 1989, PARCOM Recommendation 89/1, Third North Sea Conference, Bergen Declaration on Sustainable Development, Second World Climate Conference, Bamako Convention on Transboundary Hazardous Waste into Africa, OECD Council Recommendation of January 1991, Maastricht Treaty on the European Union, Climate Change Conference, UNCED Text on Ocean Protection, and the Energy Charter Treaty.

Federal Cleanup Law Mandates the application of the Principle of Pollution Prevention and the Precautionary Principle

The Pollution Prevention Act of 1990 established as national policy the mandate that: “Pollution should be prevented or reduced at the source wherever feasible.” According to the EPA, pollution prevention means “source reduction” which is defined in the Pollution Prevention Act as any type of action which: “reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment or disposal” and “reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.” Pollution Prevention and the Precautionary Principle are also a part of several other federal laws: CERCLA, Clean Water Act, Toxic Substances Control Act, NEPA, RCRA, EPCRA, and the Clean Air Act. For a more detailed discussion of the role of pollution prevention and the precautionary principle in federal environmental law see: *Advancing Environmental Justice through Pollution Prevention: A Report developed from the National Environmental Justice Advisory Council-A Federal Advisory Committee to the U.S. Environmental Protection Agency*, June 2003. As this report makes clear, there is an intimate relationship between environmental justice, pollution prevention, and the use of the precautionary principle, all of which are EPA policy mandates.

Montana Law Mandates the Application of the Principle of Pollution Prevention and the Precautionary Principle

In interpreting the meaning of Articles II and IX of the Montana Constitution, the Montana State Supreme Court in *Montana Environmental Information Center v. Department of Environmental*

Quality and Seven-Up Pete Joint Venture (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236) found that **Pollution Prevention** and the **Precautionary Principle** were part of the Montana Constitution's guarantee to citizens of a clean and healthy natural environment, i.e. these principles are part of Montana law. The Court found that "the right to a clean and healthful environment is a fundamental right. . . ." In analyzing the discussion and debate at the 1972 Montana Constitutional Convention, the Court determined that it was the clear intent of the participants that the environmental rights guaranteed in Articles II and IX were interrelated and that these two Articles espoused the principles of pollution prevention and the precautionary principle. For example, the Court cites Delegate McNeil who said in discussing how Articles IX's subsections (1) and (3) were related: "It goes further than that and directs the Legislature to provide remedies to prevent degradation. **This is anticipatory.**" (*Emphasis supplied.*) It was also clear during the discussion and debate during the Montana Constitutional Convention that the delegates intended the environmental provisions of the Constitution to mandate an "improvement" of the natural environment. The Court stated: "In doing so, we conclude that the delegates' intention was to provide language and protections which are both anticipatory and preventative. The delegates did not intend to merely prohibit that degree of environmental degradation that can be conclusively linked to ill health or physical endangerment. Our constitution does not require that dead fish float on the surface of our state's rivers and streams before its farsighted environmental protections can be invoked...." The Montana Supreme Court's decision is an unambiguous and binding statement that the **Principles of Pollution Prevention and the Precautionary Principle/Rule** must direct the administration and implementation of ALL state laws, rules, and regulations.

The goal of Montana's pollution prevention program is to "prevent pollution before it occurs. Pollution prevention is the highest step of the waste reduction hierarchy and occurs prior to the other steps of recycling, treatment, or disposal." (MDEQ, *What is Pollution Prevention?*) **See also:** MCA 2003, 75-10-601; 75-1-602, 8 (b) (iii) and 75-1-103 (1) and (2) (a)

Black's Law Dictionary also provides guidance as to the meanings of the concepts articulated in the Montana Supreme Court case above quoted.

Black's defines **potential** as "Existing in possibility but not in act." **Threat** is defined as a "menace." **Imminent** is defined as: "Near at hand; mediate rather than immediate, close rather than touching, perilous." **Substantial** is defined as of "Importance." Certainly, dioxin left in place at the Montana Pole Plant site would present a potential threat and a substantial, imminent threat as defined in *Black's Law Dictionary*.

\ Given that MDEQ is the "lead" agency for Montana Pole and given the legal relationship mandated in CERCLA in regard to the relationship between state and federal regulatory protocols, rubrics and standards, the Montana requirement that the Precautionary Principle and the Principle of Pollution prevention inform and guide remediation decisions must be respected by EPA and MDEQ.

The point of Montana law and federal law is that it is better to prevent pollution before it harms public health and the environment rather than treat or mitigate the effect of pollutants after they are released. The medical motto: *Primum non nocere* (First, do no harm.) would apply to

pollution prevention. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant consideration and remediation of contaminated dioxin **now** rather than waiting for these contaminants to be released and then trying to treat them later. Given the serious nature of the dioxin found at the Montana Pole Plant site, the pollution prevention principle would warrant removing as much of the dioxin as possible so as not to threaten future generations. Dioxin waste-in-place is a serious threat-in-place.

The Pollution Prevention Principle and the Precautionary Principle are in effect ARARs for the Montana Pole Plant in Butte

In effect, the provisions of the Montana Supreme Court decision *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236 as well as the other citations listed above become ARARs which must be met for the Montana Pole Plant Operable Unit. This point is clearly articulated in: *United States v. Akzo Coating of America, Inc.* No. 88-CV-73784-DT (719 F. Supp. 571, 30 ERC 1361) (E.D. Mich. August 9, 1989) ARARs do not have to be numerical standards but can be found in the law of the state. The Akzo court found: “CERCLA envisions a substantial and meaningful role for the individual states in the development and selection of remedial actions to be taken within their jurisdictions. CERCLA also accommodates the environmental standards and requirements of the state in which a site is located.” “Congress has not . . . displaced state regulation. . . .” “CERCLA does not expressly preempt state law. . . .” With specific regard to numerical standards that court found: “Although the state law does not contain specific numerical standards, it is, as the State contends, legally enforceable and of general applicability. The EPA’s own publication (EPA, *Superfund Program; Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements; Notice of Guidance*, 52 Fed. Reg 32495, 32498 (Aug. 27, 1987) recognizes that general requirements having no specific numerical standards to be enforceable ARARs. General State goals that are duly promulgated (such as a non-degradation law) have the same weight as explicit numerical standards. . . .” The Court cites numerous other cases to support its conclusion.

What are ARARs for Purposes of Montana Pole Plant?

According to the *CERCLA/Superfund Orientation Manual* (EPA/542/R-92/005, October 1992), ARARs are defined as “Any standard, requirement, criterion, or limitation under a State environmental or facility-siting law. . . .” Certainly, a decision of the Montana State Supreme Court, given the doctrine of judicial review, would qualify as a requirement, standard, criterion or limitation.” This Montana Supreme Court decision is more stringent than any other federal court decision. So given that it is enforceable, has been promulgated and is more stringent than federal case law (See: CERCLA/Superfund Orientation Manual, p. XII-2 and XII-6), this decision is an ARAR. “CERCLA, Section 121(d)(2) requires compliance with applicable or relevant and appropriate state requirements when they are more stringent than federal rules and have been ‘promulgated’ at the state level. To be viewed as promulgated and serve as an ARAR at a Superfund site, a state requirement must be legally enforceable, based on specific enforcement provisions or the state’s general legal authority, and must be generally applicable, meaning that it applies to a broader universe than Superfund site.” (*RCRA, Superfund and EPCRA Hotline Training Module: Introduction to Applicable or Relevant and Appropriate Requirements*, (EPA540-R-020, OSWER9205.5-10A, June 1998, p. 19) Clearly the

Precautionary Principle and the Principle of Pollution Prevention, as mandated by the Montana Supreme Court Decision *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236), as well as Montana state environmental policy as articulated in the MCA, are clearly ARARs for the Montana Pole Plant site. As we know, CERCLA does not contain its own cleanup standards but relies heavily on state ARARs. “Regulation codified in the NCP governs the identification of ARARs and require compliance with ARARs throughout the Superfund response process, including. . .removal actions.” (*RCRA, Superfund and EPCRA Hotline Training Module: Introduction to Applicable or Relevant and Appropriate Requirements*, (EPA540-R-020, OSWER9205.5-10A, June 1998, p. 1) Of course, as previously cited, ARARs do not have to be numerical or quantitative.

The point is that both Court precedents as well as EPA policy mandate the use of the precautionary principle as it applies to the Montana Pole Plant in Butte. The Precautionary Principle/Standard and the Principle/Standard of Pollution Prevention, as mandated by the Montana Supreme Court decision *Montana Environmental Information Center v. Department of Environmental Quality and Seven-Up Pete Joint Venture* (No. 97-455, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236) are in effect ARARS for Montana Pole Plant.

How does this discussion apply to the Montana Pole Plant?

I would like to reiterate what I have written above about dioxin.

I am deeply concerned that dioxin at the Montana Pole Plant still presents a significant, unremediated threat to human health and the environment. I am deeply concerned about the permanence and protectiveness of the proposed caps for Montana Pole. Until this problem is corrected, Silver Bow Creek cannot be fully restored and talk of future land use at the site is premature.

There are no safe levels of exposure to dioxin. An EPA report in 2012 concluded that, after reviewing mounds of evidence, there are potentially serious health effects at ultra-low levels of exposure to dioxin. Other scientific studies have linked dioxins to cancer, disrupted hormones, reproductive damage such as reduced sperm counts, neurological effects in children and adults, immune system changes and skin disorders. (EPA, Environmental Health News) Studies have shown serious health effects at parts per trillion exposure to dioxin. No wonder dioxin is considered to be one of the most toxic substances known to human beings.

The EPA lists the following as health risks associated with dioxin.

Dioxins are highly toxic and can cause cancer, reproductive and developmental problems, damage to the immune system, and can interfere with hormones.

Given that there are no safe levels of dioxin exposure, given that dioxins attack numerous human organs, given that dioxins persist over time because of their chemical stability and tendency to accumulate in the body's fatty tissue (The WHO estimates that the half-life in the body of dioxin is estimated to be 7 to 11 years.), given the fact that people are already exposed to dioxin and their toxic burden should not be

increased and given the highly toxic nature of the dioxins (that cause problems of the reproductive and developmental systems, damage to the immune system and are a potent carcinogen) that will remain in the area of restricted use at the Montana Pole Plant, my concern is whether or not the capping that will be done will be adequate to protect public health and the environment.

I repeat the above because the threat of the dioxin found at Montana Pole Plant is significant. There is a potential that as long as dioxin is left on site and not treated or removed a risk is posed for the public. There is uncertainty protective the caps will be over time. (In a separate email, I have documented the problems with caps.) There is uncertainty as to how the environment can cope with leaving dioxin in place, given that it is mobile in water. There is uncertainty as to what will be the regulatory regime in the future in that there is uncertainty as to what will be the human regulatory environment in the future. There is uncertainty regarding environmental interactions and the long term predicted limitations of capping. Significant data gaps at Montana Pole produce regulatory uncertainty. It is for these reasons that CERCLA calls for permanent remedies that emphasize treatment over containment and the reduction in the toxicity, mobility and volume of contaminants. It is for these reasons that as mandated by Federal and Montana state law, the Precautionary Principle and the Principle of Pollution Prevention, which still applies even when toxic waste is present, should apply. Where there is existing uncertainty and the potential for harm to human health and the environment, the Precautionary Principle and the Principle of Pollution Prevention applies. The burden of proof is on those who want to leave dioxin in place to prove that they are abiding by the requirement of the Precautionary Principle and the Principle of Pollution Prevention.

At a minimum the following needs to be done:

10. Check and double check the feasibility of using bio-remediation to treat the dioxin. This is what was mandated in the ROD for the Pole Plant. This approach would clean up the site of dioxin by treating the dioxin and would reduce the toxicity, mobility and volume of the contamination. It would meet the Superfund mandate for permanence. It would meet the mandates of the Precautionary Principle and the Principle of Pollution Prevention which are part of state and federal law.
 11. If bio-remediation is convincingly found to be impracticable, investigate other treatment modalities for the site.
 12. Revisit the practicability of incineration.
 13. Admit that dioxin is mobile in water and plan accordingly.
 14. If, as a very last resort, capping becomes the only alternative, mandate and ET cap.
 15. Clearly articulate from where the additional money that will be needed for the cleanup will come.
 16. Prove that the stormwater control protocols for the site will be efficacious.
 17. Comprehensively address future land uses for the site.
- Articulate a comprehensive plan for dealing with contamination under the interstate and indicate what will be the source of money.

ATTACHMENT V.2

From: [REDACTED] <[REDACTED].com>

Sent: Tuesday, March 10, 2020 5:31 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment Montana Pole Plant

The Montana Pole Plant—The Site is Not Clean; The Site is Not Safe; The Remedy is Not Working

Submitted by [REDACTED]

(I am currently a board member and immediate past president of CTEC (Citizens Technical Environmental Committee) and have been involved in Superfund issues in Butte for a long time. I am a professor at Montana Tech in Butte. The views expressed are my own and do not necessarily represent the views of Montana Tech or CTEC.)

In several ways the Montana Pole Plant is one of Butte's most dangerous Superfund sites. As is the case with so many other Superfund sites in Butte, the community is saddled with a sub-par cleanup of the Montana Pole Plant. The Montana Department of Environmental Quality (MDEQ), as well as the EPA, seems impervious to citizen concerns and steadfastly clings to this failed remedy. As the following pages indicate, there are serious shortcomings in the Pole Plant cleanup. Any talk of reuse of this land is premature until the threat to Butte's health and environment from the Plant is eliminated. Any talk of restoring Silver Bow Creek is premature until the threat from the Pole Plant is removed. The data, as well as many of the inferences from the data, that are contained in the following pages come from the EPA's and MDEQ's own documents.

The following pages make the following argument:

11. Dioxin is a deadly carcinogen for which there are no safe exposure levels.
12. Dioxin is present at the Montana Pole Plant. Hazardous furans, PCPs and PAHs are also present.
13. The cleanup of dioxin at the Montana Pole Plant is ineffective—dioxin will remain in the soils and dioxin will continue to pollute Silver Bow Creek.
14. The present cleanup of the Montana Pole Plant is not meeting cleanup standards.
15. The only protection afforded citizens from the deadly dioxin will be shallow caps over the contaminated soil which caps are not protective.
16. Institutional controls to be used at the site have been poorly characterized and have not worked at other similar sites.
17. The threat to the Pole Plant remedy from storm water runoff remains unaddressed.

18. The current Five Year Review of the Montana Pole Plant remedy refuses to independently review the quality of the cleanup.
19. MDEQ's attempts to involve the public in the Five Year Review have been abysmal. The impression is given that public input is superfluous and irrelevant.
20. There is a rush to reuse the Pole Plant before it is safe. Because this is a cash out site, MDEQ wants to hand this toxic turkey off to Butte Silver Bow as quickly as possible.

Dioxin and Montana Pole Plant—The Threat Remains—The Cleanup is Ineffective

I wish to specifically address dioxin and the Montana Pole Plant. Contrary to the assertions of the Montana Department of Environmental Quality (MDEQ) and EPA, dioxin at the Montana Pole Plant still presents a significant, unremediated threat to human health and the environment. Until this problem is corrected, Silver Bow Creek cannot be fully restored and talk of future land use at the site is premature.

There are no safe levels of exposure to dioxin. An EPA report in 2012 concluded that, after reviewing mounds of evidence, there are potentially serious health effects at ultra-low levels of exposure to dioxin. Other scientific studies have linked dioxins to cancer, disrupted hormones, reproductive damage such as reduced sperm counts, neurological effects in children and adults, immune system changes and skin disorders. (EPA, Environmental Health News) Studies have shown serious health effects at parts per trillion exposure to dioxin. No wonder dioxin is considered to be one of the most toxic substances known to human beings.

The EPA lists the following as health risks associated with dioxin.

Dioxins are highly toxic and can cause cancer, reproductive and developmental problems, damage to the immune system, and can interfere with hormones.

It is my understanding that:

6. The dioxin cleanup levels for soils at Montana Pole are not being met and will not be met in the near future.
7. Current dioxin discharge from the Montana Pole Plant into Silver Bow Creek does not meet water quality standards.
8. The water quality standards set by the ROD for Montana Pole Plant are very permissive and less restrictive/protective than national standards. So meeting these lax standards does not protect human health and the environment. But even these lax standards are not being met.
9. **The current ground water treatment system in place at Montana Pole Plant discharges dioxin into Silver Bow Creek at 100 times the lax water quality standards.**
10. This current discharge at 100 times the permissive water quality standards will continue for decades.

11. **MDEQ has decided not to adhere to the cleanup standards in the ROD for Montana Pole but will waive them.**
12. Given points 1-6 above, how can MDEQ honestly claim that the site is remediated?
13. Given points 1-6 above, how can MDEQ legitimately claim that the Montana Pole Plant site does not pose a threat to human health?
14. The public is largely unaware of points 1-6 above. Community involvement activities conducted by MDEQ have been intermittent and ineffective. Not only has the public had little role in impacting the decisions regarding Montana Pole Plant, MDEQ has been ineffective in simply informing the public as to what is taking place in regard to the Pole Plant cleanup.

In the remainder of this message, I provide independent confirmation of my assertions from experts in the field. Often, too, the data I use is MDEQ's and EPA's own statements and data. MDEQ's cavalier dismissal of this information is shocking. Again, in light of this data, how can MDEQ and EPA say that the remedy is working to protect human health and the environment?

We must remember that according to the World Health Organization: "Dioxins are highly toxic and can cause reproductive and developmental problems, damage the immune system, interfere with hormones and also cause cancer."

Dioxin poses a serious threat to both human health and the environment. There are **no** safe levels of exposure to dioxin. (EPA) In fact, dioxin has been referred to as the "most toxic chemical known." (*Hazardous Waste in America*, Epstein, Brown and Pope) Lethal effects of dioxin can be seen at very low levels—a millionth of a gram can kill lab animals. Dioxin was the toxic found in Agent Orange and at New York's Love Canal. Dioxin causes serious cancerous and non-cancerous human health effects. (World Health Organization) Dioxin can produce multiple types of cancer. Non-cancerous health effects include type 2 diabetes, impaired immune system, ischemic heart disease, endometriosis, decreased fertility, inability to carry pregnancies to term, birth defects and learning disabilities. According to a statement made by the National Institute of Environmental Health Sciences, the "dangers of dioxin last for decades after initial exposure."

The Record of Decision for Montana Pole promised that the dioxins, furans, PCBs and PAHs found at the site (all are serious health threats) would be biologically treated and the site cleaned up. Contrary to the promise of cleanup, the MDEQ and EPA have reneged on this promise. MDEQ and EPA have largely abandoned treatment in favor of containment, leaving the threat in place. Now, cleanup will consist of leaving all of these toxics on site and "managing them" through institutional controls. The EPA itself says that the toxicity of dioxin exists for an extended period of time. Containment is contrary to the Superfund mandate that treatment is to be preferred over leaving waste in place. The shoddy cleanup at the Pole Plant perpetuates a public health threat that should and could have been fixed.

However, the current containment remedy is not working. Dioxin is still being released. The groundwater treatment system that was implemented at the Pole Plant site still allows for significant discharge of dioxin into Silver Bow Creek—100 times the current dioxin surface water standard. Such discharges will continue for decades to come. MDEQ's own discharge study said that MDEQ's planned cleanup approach would still allow dioxin to be discharged into Silver Bow Creek. MDEQ has ignored this problem and continues to implement a non-protective cleanup. Why was a sub-par cleanup approach selected? The threat to human health is particularly acute for those living near the Pole Plant. Local residents have had to endure not only a failed cleanup but tremendous odor problems caused by the MDEQ's waste in place remedy.

The local EPA TAG group CTEC has called the problems associated with dioxin contamination to the attention of MDEQ and nothing has been done to address these issues. In comments submitted by CTEC to MDEQ on April 14, 2011 we find:

Dioxin in Treated Soils

Soil treatment at the site is not effective for reducing dioxin to meet the ROD cleanup level or EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites. CTEC is concerned that the current program of backfilling dioxin containing soils with a 1 ft cap of clean soil will not be protective of human health given potential future land uses, and may still provide a pathway for groundwater impacts. The failure of treatment to meet ROD cleanup levels warrants detailed evaluation in the Five Year Review.

Dioxin in Groundwater

Water quality standards for dioxin have been lowered since the ROD. The 2006 Five Year Review noted the need to evaluate lower dioxin standards, but a description of this evaluation has not been provided to the public. The Five Year Review needs to evaluate if cleanup levels for dioxin in groundwater are adequate given the new lower standards.

Extended CTEC Comments--Dioxin in Treated Soils

Treatment has not been effective at reducing dioxin levels in soil to meet ROD requirements. Data provided in the Second Five-Year Review indicates that soil with a dioxin level over 4 times the ROD cleanup level and 48 times higher than EPA industrial Regional Screening Levels (RSLs) is being backfilled at the site. Cleanup levels derived in the ROD assumed future recreational land use. The Five Year Review should evaluate if dioxin in soil will be compliant with recreational use and if not, disclose what types of reuse or institutional controls will be necessary.

The 2006 Five Year Review stated disposing of dioxin soils on top of clean fill extending at least one foot above the historical high groundwater mark and covered with at least one foot of clean fill is contemplated in the ROD. CTEC's review of the ROD does not find any contingency measures for backfilling soils which do not meet cleanup levels, including dioxin. A one foot cap of clean fill is insufficient for dioxin containing soils. Worms will actively bring dioxin

contaminated soil to the surface if caps are not greater than the frost depth in Butte, which historically has been up to 5-6 ft. Backfilling soil with dioxin is a significant difference from the remedy proposed in the ROD, which alone warrants adequate evaluation and public comment and an Explanation of Significant Differences (ESD) given the significant nature of this remedy change. CTEC contends that the ROD should be amended to address treatment of dioxin containing soils because dioxin treatment is technically practical. Treatment of dioxin soils will prevent the need for additional institutional controls (ICs) which are inherently limited in protection due to cap failures, the need for perpetual maintenance, and limitations which ICs will place of future land reuse.

CDM's (2001) study of leachability of dioxins and furans predicted groundwater concentrations under extreme worst-case conditions of 37 pg/L; 18.5 times higher than the current groundwater quality standard. CTEC is concerned that the backfilling of dioxin containing soil could present a long-term source of dioxin to alluvial groundwater, for which no permanent dioxin treatment is proposed.

The ROD states waste should not be stored or disposed within the 100-yr floodplain. FEMA maps indicate the 100-yr floodplain includes a large portion of the site. The Five Year Review should provide maps of the 100-year floodplain and maps of locations where soils with dioxin levels exceeding cleanup levels have been backfilled. Soils containing dioxin should not be backfilled within the floodplain under the current ROD or any changes invoked with an ESD.

Alternatives to backfilling and institutional control need to be considered for soils which do not meet dioxin cleanup levels. CTEC recommends dioxin treatments such as using white rot fungi be used to optimize the remedy for treatment of waste and future land re-use.

Extended CTEC Comments--Dioxin in Groundwater

The 2006 Five Year Review states (pp19) average August 2005 influent TCDD concentration in groundwater is 19.46 pg/L and plant effluent averaged 0.518 pg/L. The 2006 Five Year Review also indicates dioxin concentrations up to 43.45 pg/L at the leading periphery of the contaminant plume. These concentrations exceed both current groundwater standards and surface water standards (for effluent).

The 2006 Five Year Review indicated that DEQ and EPA would evaluate modification of the cleanup standards for dioxins in groundwater and in discharge to surface water to the current standards, 2 pg/L and 0.05 pg/L respectively. To date, the public has only been provided with the statement that the new water quality standards were considered during summer 2007 but that the existing remedy was deemed appropriate (DEQ December 2009 update), which does not explain how the need to meet current water quality standards was evaluated or the rationale for not adopting the current standards. The Five Year Review needs to describe in detail the evaluation of these updated water quality ARARs.

The dioxin concentration of 43.45 pg/L sampled at the leading periphery of the contaminant plume is 22 times the current groundwater standards and 869 times current surface water standards. An evaluation of groundwater impacts to surface water, springs and wetlands, once the groundwater capture and remediation system is no longer operated. A comparison of dioxin

levels in groundwater at MPTP with background levels of dioxin in groundwater at other urban areas would be helpful for the public to understand the magnitude of dioxin levels. Evaluation of long-term fate of dioxin in groundwater needs to be incorporated into the evaluation of dioxin cleanup levels to meet current water quality standards.

CTEC's review of the Butte Alluvial and Bedrock Controlled Ground Water Area (BABCOWA) Petition and Final Order indicates that the controlled groundwater area designation was focused on the widespread metals contamination from mining and not dioxin. The plume of groundwater contaminated with dioxin may have expanded. The BABCOWA does not consider dioxin in water quality testing of wells completed in contaminated aquifers. It needs to be determined whether the BABCOWA will adequately protect the public and environment from drinking PCP or Dioxin contaminated water.

Please also note the following subsidiary information that relates to problem associated with the Montana Pole Plant cleanup:

The biological degradation rate of these compounds is generally very slow when compared to other organic compounds. Because PCDDs and PCDFs have very low vapor pressures, they do not readily evaporate or volatilize to the atmosphere. The compounds adhere tightly to soil particles and do not migrate readily or leach into groundwater or surface water unless the contaminated soil particles themselves migrate via erosion processes (Freeman, 1989). (Emphasis supplied.) page 14

Soil-Plant Transfer of Polychlorinated Dibenzo-p-dioxins and Dibenzofurans to Vegetables of the Cucumber Family (Cucurbitaceae) Anke. Huelster , Jochen F. Mueller , Horst.

Marschner *Environ. Sci. Technol.*, 1994, 28 (6), pp 1110–1115 **DOI:**

10.1021/es00055a021 Publication Date: June 1994 (Article: Indicates that dioxin is mobilized in soils as the result of plant activity. Given that there will only be a 12 inch cap over dioxin contaminated soils and the cap will have vegetative cover, the vegetative cover will absorb dioxin and bring it to the surface.)

Sorption of 2,3,7,8-tetrachlorodibenzo-p-dioxin to soils from water/methanol mixtures

Richard W. Walters , Annette. Guiseppi-Elie *Environ. Sci. Technol.*, 1988, 22 (7), pp 819–

825 **DOI:** 10.1021/es00172a012 Publication Date: July 1988

Study by U.S. Dept of Agriculture indicated that dioxin is only immobile in soils devoid of other organic material. If any organic co-solvents as are present at the Pole Plant are in the soil, mobility will occur.

SUBSTANTIAL MIGRATION OF DIOXINS IN AGROCHEMICAL

FORMULATIONS, Grant, Sharon, Mortimer, Munro, Stevenson, Gavin, Malcolm, Don and Gaus, Caroline, The University of Queensland (National Research Centre for Environmental Toxicology (EnTox)), 39 *However, the presence of co-contaminants can act as transport*

facilitators for otherwise low mobility organic compounds (LMOCs) These results highlight that the paradigm of LMOCs being non mobile in soils should be considered carefully together with application specific and environmental factors which may have the ability to considerably change the predicted environmental fate of these chemicals.

(This article supports the above mentioned study by the U.S. Department of Agriculture that if, as we find at the Pole Plant, co-contaminates are present, dioxin does become mobile in soil. The point is that since the remedy for the Pole Plant was changed from one of active treatment to containment, co-contaminants that will make dioxin mobile in soil will be present.

We must remember that according to the last Five Year Review of the Montana Pole Plant:

The cleanup levels for dioxins in soils are not currently being met and are not anticipated to be met if the current remedy operates as intended. CDM's Technical Memorandum Vadose Zone Soils Dioxin/Furan Mobility Evaluation, September 27, 2001, evaluation concluded that dioxins and furans are not likely to be treated, biodegraded, or leached from soils during bioremediation. . . . MDEQ admits that cleanup levels are not being met and will not be met. Yet, MDEQ clings to a remedy, which by their own admission, is not working.

The dioxin contamination problem is made worse because of storm water runoff through the Pole Plant. MDEQ admits that this is a problem but, so far, has done little to fix the problem.

1. The Record of Decision for the Montana Pole Plant clearly calls for active treatment of the waste as the primary cleanup method. The ROD does not support keeping waste in place as the primary or major approach to cleanup. Somewhere along the way, the emphasis on active treatment was changed to an emphasis on containment under caps. That was pretty clear at the Tuesday night (October 29, 2013) Pole Plant meeting.

Pages 6, 7, and 35 of the Pole Plant ROD clearly stipulate that active treatment will be the cleanup method. In the *Record of Decision—Montana Pole Plant* we find this quotation that exemplifies the position in the Record of Decision:

All accessible contaminated soils and LNAPL will be excavated to the extent practicable and treated, preventing this material from continuing to contaminate groundwater. The selected remedy will also satisfy the preference for treatment as a principal element of the remedy. Page 35

2. Active biological treatment **does work** on wastes such as we find at the Pole Plant and in our climate. For example, an article entitled: "Treatment of Dioxin Contaminate Soils," Standberg, et. al, published in November 2011 by the Swedish Environmental Research Institute provides compelling evidence of the efficacy of active biological treatment on wastes similar to those found at the Pole Plant and in

a climate similar to Butte's climate. See also: *Biodegradation of Dioxins and Furans* by Rolf Wittich, July 15, 1998):

Bioremediation of organic pollutants and heavy metals by use of microorganisms represents a safe, inexpensive, and environmentally-friendly concept in modern environmental engineering. During the last three decades intense efforts have been made by microbiologists and environmental engineers in the isolation and characterization of microorganisms capable of degradation, transformation and detoxification of recalcitrant chemical compounds of environmental concern: (polyhalogenated) dibenzo-p-dioxins, dibenzofurans, and diphenyl ethers. Special emphasis is placed on the potential of molecular biology techniques to improve presently available biocatalysts. (Biodegradation of Dioxins and Furans by Rolf Wittich, July 15, 1998)

3. Dioxin is mobile in soils such as those at the Montana Pole Plant. The ROD itself says that it is possible for dioxin in soils to migrate. (Page 14) There are present in the Montana Pole Plant soils co-contaminants that can mobilize dioxin. In addition, the caps that are used will not prevent surface water and other contaminants from leaching down and mobilizing dioxin. Given the problems of caps with bio-irrigation, advection, desiccation, erosion, weathering, bio-intrusion and stabilization, the dioxin in the soil will be mobilized. Only in a pure lab setting does dioxin remain non-mobile. Certainly the Montana Pole Plant is not a pure lab setting. (See: Dioxin reservoirs in southern Viet Nam--A legacy of Agent Orange by Divernychuk, et al in *Chemosphere* 47 (2002) 117-137. Similar findings are reported in the following:

6. **Soil-Plant Transfer of Polychlorinated Dibenzo-p-dioxins and Dibenzofurans to Vegetables of the Cucumber Family (Cucurbitaceae)** Anke. Huelster , Jochen F. Mueller , Horst. Marschner *Environ. Sci. Technol.*, 1994, 28 (6), pp 1110–1115 **DOI:** 10.1021/es00055a021 Publication Date: June 1994 (Article: Indicates that dioxin is mobilized in soils as the result of plant activity. Given that there will only be a 12 inch cap over dioxin contaminated soils and the cap will have vegetative cover, the vegetative cover will absorb dioxin and bring it to the surface.)
7. **Sorption of 2,3,7,8-tetrachlorodibenzo-p-dioxin to soils from water/methanol mixtures** Richard W. Walters , Annette. Guiseppi-Elie *Environ. Sci. Technol.*, 1988, 22 (7), pp 819–825 **DOI:** 10.1021/es00172a012 Publication Date: July 1988
8. **Study by U.S. Dept. of Agriculture indicated that dioxin is only immobile in soils devoid of other organic material. If any organic co-solvents, as are present at the Pole Plant, are in the soil, mobility will occur.**
9. **SUBSTANTIAL MIGRATION OF DIOXINS IN AGROCHEMICAL FORMULATIONS**, Grant, Sharon, Mortimer, Munro, Stevenson, Gavin, Malcolm, Don and Gaus, Caroline, The University of Queensland (National Research Centre for Environmental Toxicology (EnTox)), 39 *However, the presence of co-contaminants can act as transport facilitators for otherwise low mobility organic compounds (LMOCs) These results highlight that the paradigm of LMOCs being non mobile in soils should be considered carefully together with application specific and*

environmental factors which may have the ability to considerably change the predicted environmental fate of these chemicals.

(This article supports the above mentioned study by the U.S. Department of Agriculture that if, as we find at the Pole Plant, co-contaminates are present, dioxin does become mobile in soil.

The point is that since the remedy for the Pole Plant was changed from one of active treatment to containment, co-contaminants that will make dioxin mobile in soil will be present.

10. *Assessment of Dioxin Contamination at Sawmill Sites: A Report to the Ministry for the Environment by Tonkin & Taylor Ltd and SPHERE, Prepared for the New Zealand Ministry for the Environment*

October 2008 (conclusions are similar to the one's I included in my earlier email to you today, i.e. that dioxin is mobile in both soil and water.

Also, data presented by the MDEQ at the Tuesday, October 29 meeting indicated that dioxin is present in the recovery trenches at the Pole Plant. If dioxin isn't mobile in soil at the Pole Plant, how did the dioxin get in the recovery trenches? Another point that Ian made: MDEQ is in charge of the cleanup in Missoula of the White Pine Sash site. This site was a wood treatment facility similar to Montana Pole. The MDEQ acknowledges at this site that dioxin can be mobile in soils. Why not acknowledge the same at Montana Pole? Finally, the dioxin levels that we are now seeing in groundwater at the Montana Pole Plant were not supposed to have been reached until 200,000 years from now according to MDEQ. Why, if dioxin is not mobile, are we seeing dioxin now that we should not have seen for 200,000 years?

Summary of my position:

1. The bottom line is that the dioxins, Pcps, Pahs and furans found at the site are highly toxic and carcinogenic.

Dioxin poses a serious threat to both human health and the environment. There are **no** safe levels of exposure to dioxin. (EPA) In fact, dioxin has been referred to as the “most toxic chemical known.” (*Hazardous Waste in America*, Epstein, Brown and Pope) Lethal effects of dioxin can be seen at very low levels—a millionth of a gram can kill lab animals. Dioxin was the toxic found in Agent Orange and at New York’s Love Canal. Dioxin causes serious cancerous and non-cancerous human health effects. (World Health Organization) Dioxin can produce multiple types of cancer. Non-cancerous health effects include type 2 diabetes, impaired immune system, ischemic heart disease, endometriosis, decreased fertility, inability to carry pregnancies to term, birth defects and learning disabilities. According to the National Institute of Environmental Health Sciences, the “dangers of dioxin last for decades after initial exposure.” Just dealing with contaminant level statistics can mask the danger posed by these contaminants.

2. These toxics will largely remain on site to pose a perpetual threat to human health and the environment. The site will never be cleaned up.

3. Even the data presented at the October 29th meeting shows that these toxics have been released. Perhaps these toxics have not been released in large quantities, perhaps they are not released all the time, but given the toxicity of the materials even relatively small releases are problematic. And given that the site will not be cleaned up, these releases will continue in perpetuity.

4. Based on the discussion of the DEQ 7 standards, it is obvious that the cleanup levels in the original Record of Decision for the Pole Plant are not protective. The problem is that the current cleanup is not meeting, in a significant number of cases, the DEQ 7 standards. Yet, the presentation on October 29th continually referred to meeting the outdated, non-protective EPA standards in the Record of Decision. Probably, the old Record of Decision will never be reopened.

5. The comparisons of the Pole Plant site to other sites presented at the October 29th meeting don't prove anything. Because, for example, the Pole Plant is comparable to other similar sites does not mean that the Butte cleanup is working to protect human health and the environment. We saw a gross misuse of comparisons.

6. The extensive use of caps for the Pole Plant is very problematic. Butte's history with capping toxic waste has not been good. Caps have been very problematic. The dioxins and other contaminants at the Pole Plant will all be just left in place, covered with only 12 inches of topsoil caps. Previous capping on the Butte Hill, which uses more soil than the level at the Pole Plant, has not worked well. We have a situation where the most toxic substances in Butte (dioxins, PCPs and furans) are to be covered with the least amount of soil. Caps, as we have seen in Butte, already are susceptible to failure by means of bio-irrigation, advection, dessication, erosion, weathering, bio-intrusion and stabilization problems. Caps also have significant construction, repair and maintenance problems.

7. Because the responsible parties for the cleanup cashed out, we better get it right now. The money for the cleanup is limited. My view is that a quality cleanup at Montana Pole has been sacrificed because of this cash out.

In short:

The Record of Decision for Montana Pole promised that the dioxins, furans, PCPs and PAHs found at the site (all are serious health threats) would be biologically treated and the site cleaned up. Contrary to the promise of cleanup, the MDEQ and EPA have reneged on this promise. MDEQ and EPA have largely abandoned

treatment in favor of containment, leaving the threat in place. Now, cleanup will consist of leaving all of these toxics on site and “managing them” through institutional controls. The EPA itself says that the toxicity of dioxin exists for an extended period of time. Containment is contrary to the Superfund mandate that treatment is to be preferred over leaving waste in place. The shoddy cleanup at the Pole Plant perpetuates a public health threat that should and could have been fixed.

However, the current containment remedy is not working. Dioxin is still being released .The groundwater treatment system that was implemented at the Pole Plant site still allows for significant discharge of dioxin into Silver Bow Creek— 100 times the current dioxin surface water standard. Such discharges will continue for decades to come. MDEQ’s own discharge study said that MDEQ’s planned cleanup approach would still allow dioxin to be discharged into Silver Bow Creek. MDEQ has ignored this problem and continues to implement a non-protective cleanup. Why was a sub-par cleanup approach selected? The threat to human health is particularly acute for those living near the Pole Plant.

So, while progress has been made, the rosy picture presented at the October 29th meeting does not give us a full picture of what is going on at the Pole Plant.

In addition to the citations I provided in this document, I would also ask that you review Ian’s submission of November 5, 2013 to the CTEC board giving his reactions to the conclusions presented at the October 29, 2013 meeting.

The following is the email from Ian of March 27, 2013 which I include as a reference point.

From: [REDACTED] <[REDACTED]@kirkenr.com>
To: [REDACTED] <[REDACTED]@wet-llc.com>; [REDACTED] <[REDACTED]@blm.gov>; [REDACTED] <[REDACTED]@gmail.com>; [REDACTED] <[REDACTED]@mtech.edu>; [REDACTED] <[REDACTED]@gmail.com>; [REDACTED] <[REDACTED]@gmail.com>; [REDACTED] <[REDACTED]@bresnan.net>; [REDACTED] <[REDACTED]@montana.com>; [REDACTED] <[REDACTED]@mtech.edu>; [REDACTED] <[REDACTED]@yahoo.com>; CTEC <[REDACTED]@hotmail.com>; [REDACTED] <[REDACTED]@mse-ta.com>
Sent: Wednesday, March 27, 2013 9:18 AM
Subject: MT Pole

[REDACTED]
I thought I would summarize for you the important points from the Montana Pole update at the meeting the other night.

1. The groundwater treatment system discharges dioxin into Silver Creek at 100 times the current very low surface water standard. This is expected to continue for decades under the current plan.

It needs to be shown that this will not impact the health of aquatic life, fish, or people who eat them.

2. The Five Year Review from 2011 included three action items that the agencies would summarize for the layperson and distribute to the public the review findings, air monitoring health risks, and that they sampled soil where the wind-break trees died. This was to be an important response to citizens comments and still needs to happen.



Therefore, the only protection from the dioxin in the soils at Montana Pole Plant will be the caps placed over the soil. However, storm water runoff, which continues to be an unremediated problem, compromises the integrity of the soil caps. After all there will only be a few inches of cap to protect the public.

The so-called cleanup of the Montana Pole Plant has been in many important respects a failure. Currently, the Montana Pole Plant is undergoing another Five Year Review where the EPA and MDEQ will evaluate their own work. MDEQ has not even solicited public comment on the Five Year Review. In an ad in local newspapers, MDEQ said simply: "If you would like to learn more about the Montana Pole and Treating plant Superfund site, please visit the DEQ website." This ad did not encourage the public to comment.

Any sound decision making system has a built in evaluation mechanism whereby, after implementation, decisions can be assessed as to effectiveness in meeting the goals of the decision. Superfund decisions undergo periodic, every five years, reviews that are supposed to assess whether or not the remedy selected by EPA is protecting human health and the environment. These reviews are called "Five-Year Reviews." Currently, the Montana Pole Plant is undergoing such a review. However, the review is being conducted by the very people that are also implementing the remedy—hardly a good recipe for an evaluation process. In fact, they have gone so far as to interview each other as part of the evaluation process.

What is needed is for those evaluating the Montana Pole Plant remedy to not be the same people who are implementing the remedy. I make no accusations of wrongdoing. I am simply saying that evaluation and implementation should be separate. Even without realizing it, we may be biased in favor of our own work. There is also a question of public confidence in the outcome of the review. Would the public have more confidence in a review done by independent experts or in a review done by those who implement the remedy?

An independent evaluation provides independent perspective, judgement and feedback. There is a tendency for people to praise their own work. How realistic is it for the public to expect that MDEQ will criticize its own work? We all have a tendency to be biased in our own favor.

An independent review provides a level of certainty and corroboration missing from a purely internal review. An independent review maintains the integrity of the process. An independent review is transparent and fair.

What I am asking is that the current Five Year Review of Montana Pole Plant be subjected to an independent peer review by qualified experts who are not part of the implementation process. MDEQ should not evaluate its own work. This is standard procedure in the scientific and academic community. Subjecting one's work to independent peer review is standard practice for the reasons mentioned above. The people doing the implementing of the remedy at Montana Pole are, I am sure, fine people. However, they should not be tasked with the impossible burden of evaluating their own work.

Consider the benefits of an independent peer review: According to the U.S. Department of Energy a *"peer review is a documented, critical review performed by peers [defined in the USNRC report as "a person having technical expertise in the subject matter to be reviewed (or a subset of the subject matter to be reviewed) to a degree at least equivalent to that needed for the original work"] who are independent of the work being reviewed. The peer's independence from the work being reviewed means that the peer, a) was not involved as a participant, supervisor, technical reviewer, or advisor in the work being reviewed, and b) to the extent practical, has sufficient freedom from funding considerations to assure the work is impartially reviewed.*

A peer review is an in-depth critique of assumptions, calculations, extrapolations, alternate interpretations, methodology, and acceptance criteria employed, and of conclusions drawn in the original work. Peer reviews confirm the adequacy of the work.

What confidence can the public have in this Five Year Review?

In short:

8. Dioxin and other major contaminants are present at the Montana Pole Plant. EPA and the Montana Department of Environmental Quality have said so.
9. The Montana Pole Plant was listed as a Superfund site because it was determined by EPA that these toxics posed a serious risk to human health and the environment.
10. Dioxin will remain on site at the Pole Plant, covered by a thin topsoil cover, after the cleanup is completed. Just read the statements to that effect from MDEQ.
11. These thin caps have proven to fail regularly in the rest of Butte.
12. Storm water runoff regularly flows through the Pole Plant and can wash toxics into Silver Bow Creek.
13. Given the thin cover and the fact that dioxin is left on site, how can MDEQ certify that that site is safe for further future use?

14. Before the site can be deemed remediated and before Silver Bow Creek can be restored, dioxin and other associated toxics at the Montana Pole site must be REMOVED and destroyed.

After the so called cleanup is completed, deadly dioxin will remain in the soils at the Montana Pole Plant. The only protection that the public will have from this deadly dioxin will be a relatively shallow soil cap. Soil caps have not worked well in Butte. Please consider the following:

Caps are not Permanently Protective of Human Health and the Environment.

Problems with caps:

14. Metals can be remobilized through bio-irrigation. (Dueri, Sibylle, et. al., University of Laval, Quebec, "Modeling the Transport of Heavy Metals through a Capping-Layer: The case Study of the Flood Sediments Deposited in the Saguenay Fjord, Quebec.")
15. The long term efficacy of caps can be compromised by advection "related to consolidation, diffusion, chemical reactions, and the effect of . . . burrowing activity." (*Ibid.*)
16. Desiccation can cause cracking of the cap cover. (David Daniel, Professor of Civil Engineering, University of Texas, *Geotechnical Practice for Waste Disposal*)
17. The freeze-thaw cycle can produce changes in the structure and fabric of the cover and a way that increases hydraulic conductivity. (*Ibid.*)
18. Caps are difficult to construct correctly. (*Ibid.*)
19. Caps are difficult to maintain and repair. (*Ibid.*)
20. Erosion is a serious problem. (Jack Caldwell, U.S. Department of Energy, *Principles and Practice of Waste Encapsulation.*)
21. Biointrusion can compromise the effectiveness of the cap. (*Ibid.*)
22. Differential settlement of the cap can cause cracking. (Oweis and Khera, New Jersey Institute of Technology, *Geotechnology of Waste Management.*)
23. Caps require regular and often expensive repair. (*Ibid.*)
24. Stabilization of the cap is a problem. (*Ibid.*)
25. Caps present long-term subsidence and settlement issues. (*Ibid.*)
26. Because of their susceptibility to "weathering, cracking and subsidence" caps have limited long term utility. "Wind, rain, and generalized erosion over time can severely damage even a well-designed . . . cover." (U.S. Department of Energy, Office of Environmental Management, "Remediation Technology Descriptions: Containment.") See also: Merritt, Frederick (ed.) *Standard Handbook for Civil Engineers*, McGraw-Hill, New York.

The extensive use of caps as a cleanup method for Montana Pole Plant would do nothing to reduce the toxicity and volume and mobility of contaminants. Caps do nothing to clean up a site. The extensive use of caps as a cleanup method for Montana Pole Plant would not provide a

permanent remedy. The extensive use of caps as a cleanup method for Montana Pole Plant would violate the Superfund mandate for treatment over containment. In short, the extensive use of caps for the Montana Pole Plant would not be protective of human health and the environment.

In addition to caps, the remedy for the Montana Pole Plant depends on institutional controls to keep the public from contacting the deadly contaminants at the Plant.

The Public should be concerned about too great a Reliance on Institutional Controls.

Institutional controls per se do nothing to reduce the mobility, toxicity, or volume of contaminants. Institutional controls do nothing to clean up a site. The institutional controls being considered in the EPA's RI/FS for Priority Soils would seriously limit productive land uses and greatly compromise the property rights of owners to use their land as they determine. The extensive reliance on institutional controls is also contrary to the Superfund mandate of preference for treatment over restricted land use. Institutional controls do nothing to treat a site. The EPA's own document "Rules of Thumb for Superfund Remedy Selection" states that the law mandates a clear preference for treatment over all other approaches. "EPA expects to use treatment to address the principal threats posed by a site. . . ." [40 CFR 300.430(a)(1)(iii)(A)]. The above document also notes: "Institutional controls. . . generally shall not substitute for more active measures. . . ." (pp. 12-13)

The EPA itself has found significant problems with institutional controls at its other sites. In an article entitled "EPA, Think Tank Studies Show Superfund Land-use Controls Flawed, December 10, 2001" which summarizes "Superfund Report via Inside EPA.com" by Resources for the Future, we find these conclusions, *reached by the EPA itself*, which due to their significance, I will quote at length:

"EPA and environmental think tank studies have shown that the federal and state governments' land-use restrictions at Superfund sites, known as institutional controls (IC), are seriously flawed, with an agency study showing the controls are not reliably implemented and the think tank report finding the controls are dramatically under-funded."

"During a November 27 land use control summit, sponsored by the International City/County Management Association (ICMA), EPA officials and the Environmental Law Institute (ELI), outlined numerous shortcomings they have found with EPA's IC monitoring and enforcement efforts nationwide. While EPA released the results of a study showing EPA has failed to ensure Superfund ICs are reliably implemented, and ELI study indicates that EPA's ICs are dramatically under-funded."

"Bruce Means, of EPA's Federal Facilities Restoration and Reuse Office, told attendees that preliminary studies show that half of the ICs implemented under Superfund records of decisions (ROD) were mischaracterized. During a study of RODs conducted during 1999 and 2000, the agency found that half of the ICs established under RODs were not implemented as the agency had planned."

“And Jay Pendergrass of ELI outlined the preliminary findings of ELI’s study of state’s IC programs, which showed that the programs are severely under-funded.”

“In a draft version of the report, Pendergrass found that state environmental programs are underfunded and as a result the sites allocate very little time on IC implementation. The funding and staffing shortfall ‘raises concerns about whether [ICs] are implemented as intended and [are] as protective as intended.’”

“An ICMA source agrees that EPA has serious problems with its IC program, saying that the agency has many RODs with vague or inconsistent references to such controls.”
(pages 1-2)

The greater the cleanup of the Butte Priority Soils Operable Unit, the more the site can be used productively. The less cleanup of the BPSOU, the less the site can be used for residences and recreational uses. Given the EPA’s admission that institutional controls have failed it in the past, it is amazing that the remedies listed in the RI/FS for Priority Soils call for such extensive use of institutional controls.

Other Problems with Institutional Controls:

- n. There is a tendency not to implement institutional controls as time passes. Frequently institutional control mandates are not carried to completion.
- o. The effectiveness of institutional controls usually depends upon the ability, personnel and resources of the local government to implement. Often local governments do not have the personnel or resources to devote to the implementation and monitoring of institutional controls. Given the national administration’s proposed cutbacks in Superfund allocations, resources will be increasingly unavailable on the national level to monitor implementation and effectiveness of institutional controls. Certainly the financial capacity of Butte’s local government to implement and monitor institutional controls is greatly limited. Nowhere does the EPA’s comprehensively address the above issue.
- p. “Institutional controls rely heavily on humans to implement, oversee, and administer them. It is human nature to ignore tasks that no one else seems to care about or where the purpose is not readily apparent. Residual hazardous substances are a classic example of a problem that is not readily apparent.” (“Protecting Public Health at Superfund Sites: Can Institutional Controls Meet the Challenge?” Environmental Law Institute, p. 2)
- q. Although EPA must review the remedy every five years, the frequency of this review process may be insufficient to detect the failure of institutional controls.
- r. The use of education as part of the institutional controls strategy is a substantial part of the EPA’s approach to implementing institutional controls. Research of previous remedies under Superfund indicates that education programs fail to materialize.
- s. “In addition to the direct costs of implementing institutional controls, their use can impose substantial indirect costs on communities, property owners, prospective purchasers and developers by limiting the ways a site may be used. The burden of the restrictions on use of the site falls on the property owner and the community, with the owner reaping potentially lower profits from use of the property and the community receiving lower social benefits from the allowed uses than would have been possible if no restrictions existed.” (ELI, *Ibid.*)

- t. Because the sites where institutional controls will be implemented will not be cleaned up and will present a continuing potential threat to human health, these sites will be off limits to development in perpetuity. It is difficult to see how the use of institutional controls meshes with the goals of the EPA's Superfund Redevelopment Initiative.
- u. It is impossible to determine future possible land uses for the site nor is it possible to predict unanticipated land uses. (See: "Linking Land Use and Superfund Cleanups: Uncharted Territory," by Probst, Hersh, Wernstedt and Mazurek, *Summary of Findings*, RFF, p. 1)
- v. "Institutional controls have more problems than just risk miscalculation. Breaches in the site because of future construction, or even animals may cause the control to fail. The lack of a required contingency plan, would not account for new remedies, new information, or failed institutional controls negatively impacts the effectiveness of the treatment. Institutional memory loss was well is an important factor. This memory loss occurs when a party decides to breach the original institutional control without its own knowledge. In fact, in the ICMA (International City/County Management Association) study, the majority of respondents (63%) said that breaches in the institutional controls on a site were highly or somewhat likely. Following up on that question, 30% of the respondents reported that no formal inspection schedule was set up to evaluate the site as require by law." (Erwin Tam, Environmental Science and Economics, UC Berkeley, "Analysis of Institutional Controls at California Superfund Sites.")
- w. "Concern has been expressed about the long-term viability of institutional controls as a remediation tool. For example, they may be forgotten; enforcement agencies may not effectively review properties or land users' actions; or land users simply may take their chances. Decision makers should weigh the full costs of such options, including capital costs, costs of long-term sampling and analysis, and costs of replacing equipment, as well as concerns about potential long-term risks associated with contaminants left in place, against the cost options that would remove the contaminants completely. Many local governments do not yet have the capacity and resources necessary to meet the challenges of long-term stewardship." ("Understanding the Role of Institutional Controls at Brownfields Sites: Major Concepts and Issues.")
- x. Because institutional controls leave large amounts of contaminants in place, institutional controls will have to be perpetual. Who is to say what anticipated land uses come up for an institutionally controlled area? For example, fifty years after the record of decision for Butte Priority Soils is implemented, the contaminants will still be there threatening human health and the environment, but will the will be there to restrict land uses in order to prevent the release of contaminants. "Institutional controls 'work' only if they are complied with. And while this is true of any site remedy, institutional controls require monitoring and enforcement over long time periods." ("Linking Land Use and Superfund Cleanups: Uncharted Territory, Probst, et al., Resources for the Future Center for Risk Management.) Will the will to enforce institutional controls exist fifty to a hundred years in the future?
- y. Legal, social and political pressures limit the effectiveness of institutional controls. (*Ibid.*)
- z. The long-term effectiveness of institutional controls is unknown. "There has, however, been little investigation of what happens at sites on the National Priorities List (NPL) when land use plays a prominent role in the remedy selection process. There also has been little analysis of what institutions are involved in making land use decisions and

maintaining land use restrictions over time. It is unclear what legal mechanisms are most effective, what institutions will be responsible for enforcing institutional controls, and who's going to pay for these additional responsibilities. We need to be able to answer these questions if land use-based remedies are to be protective over the long term." (*Ibid.*)

"Planners of long-term disposal systems have long recognized the difficulty of maintaining institutional control over property. . . ." (Jack A. Caldwell and Charles C. Reith, *Principles and Practice of Waste Encapsulation*, 1993, p. 35)

Summary

Eternal vigilance is the price of liberty. Thomas Jefferson

Wouldn't it be nice if citizens could trust government to do the right thing. Unfortunately, that doesn't always happen. Anytime power is given to a government institution, that institution can escape popular accountability. Even when government is supposedly acting to promote and protect public health and safety, citizens need to be on their guard. The public interest is best promoted and protected by a vigilant public.

The Montana Pole Plant Superfund site in Butte usually flies below the public radar, except for those living near the site. Because surface water, groundwater, soils and sediments at the Pole Plant are contaminated with dioxins, the Pole Plant is, perhaps, the most dangerous of the Superfund sites in Butte. The Pole Plant cleanup by the Montana Department of Environmental Quality (MDEQ) leaves much to be desired.

Dioxin poses a serious threat to both human health and the environment. There are **no** safe levels of exposure to dioxin. (EPA) In fact, dioxin has been referred to as the "most toxic chemical known." (*Hazardous Waste in America*, Epstein, Brown and Pope) Lethal effects of dioxin can be seen at very low levels—a millionth of a gram can kill lab animals. Dioxin was the toxic found in Agent Orange and at New York's Love Canal. Dioxin causes serious cancerous and non-cancerous human health effects. (World Health Organization) Dioxin can produce multiple types of cancer. Non-cancerous health effects include type 2 diabetes, impaired immune system, ischemic heart disease, endometriosis, decreased fertility, inability to carry pregnancies to term, birth defects and learning

disabilities. According to the National Institute of Environmental Health Sciences, the “dangers of dioxin last for decades after initial exposure.”

The Record of Decision for Montana Pole promised that the dioxins, furans, PCPs and PAHs found at the site (all are serious health threats) would be biologically treated and the site cleaned up. Contrary to the promise of cleanup, the MDEQ and EPA have reneged on this promise. MDEQ and EPA have largely abandoned treatment in favor of containment, leaving the threat in place. Now, cleanup will consist of leaving all of these toxics on site and “managing them” through institutional controls. The EPA itself says that the toxicity of dioxin exists for an extended period of time. Containment is contrary to the Superfund mandate that treatment is to be preferred over leaving waste in place. The shoddy cleanup at the Pole Plant perpetuates a public health threat that should and could have been fixed.

However, the current containment remedy is not working. Dioxin is still being released. The groundwater treatment system that was implemented at the Pole Plant site still allows for significant discharge of dioxin into Silver Bow Creek—100 times the current dioxin surface water standard. Such discharges will continue for decades to come. MDEQ’s own discharge study said that MDEQ’s planned cleanup approach would still allow dioxin to be discharged into Silver Bow Creek. MDEQ has ignored this problem and continues to implement a non-protective cleanup. Why was a sub-par cleanup approach selected? The threat to human health is particularly acute for those living near the Pole Plant. Local residents have had to endure not only a failed cleanup but tremendous odor problems caused by the MDEQ’s waste in place remedy.

Citizens have a right to know if and why government is not doing what it said it would do to protect human health and the environment. Agency decisions are binding.

The Pole Plant cleanup, again contrary to what was promised regarding community involvement, has failed to provide the public with timely information about the problems with the cleanup. The lack of any coordinated or effective program for citizen involvement means that citizens are prevented from holding government accountable and influencing government cleanup activities. The lack

of transparency by the MDEQ and EPA means that citizens are left to “hope” that government does the right thing.

The public deserves answers to the following questions: (1) Why is the Pole Plant still out of compliance with emission standards for dioxin? And (2) Why hasn't the Pole Plant been cleaned up? After all, the public's safety is the highest law.

(Roman law)

ATTACHMENT V.3

From: [REDACTED] <[REDACTED].com>
Sent: Tuesday, March 10, 2020 5:31 AM
To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>
Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>
Subject: [EXTERNAL] Additional Public Comment Montana Pole Plant

Dioxin Caps—Concerns/Questions about the Proposed Caps and Area of Restricted Use at Montana Pole Plant

Submitted by: [REDACTED]

Dioxin contaminated soils will be left on-site at Montana Pole.

I wish to specifically address dioxin and the Montana Pole Plant. I am deeply concerned that dioxin at the Montana Pole Plant still presents a significant, unremediated threat to human health and the environment. I am deeply concerned about the permanence and protectiveness of the proposed caps for Montana Pole. Until this problem is corrected, Silver Bow Creek cannot be fully restored and talk of future land use at the site is premature.

There are no safe levels of exposure to dioxin. An EPA report in 2012 concluded that, after reviewing mounds of evidence, there are potentially serious health effects at ultra-low levels of exposure to dioxin. Other scientific studies have linked dioxins to cancer, disrupted hormones, reproductive damage such as reduced sperm counts, neurological effects in children and adults, immune system changes and skin disorders. (EPA, Environmental Health News) Studies have shown serious health effects at parts per trillion exposure to dioxin. No wonder dioxin is considered to be one of the most toxic substances known to human beings.

The EPA lists the following as health risks associated with dioxin.

Dioxins are highly toxic and can cause cancer, reproductive and developmental problems, damage to the immune system, and can interfere with hormones.

Given that there are no safe levels of dioxin exposure, given that dioxins attack numerous human organs, given that dioxins persist over time because of their chemical stability and tendency to accumulate in the body's fatty tissue (The WHO estimates that the half-life in the body of dioxin is estimated to be 7 to 11 years.), given the fact that people are already exposed to dioxin and their toxic burden should not be increased and given the highly toxic nature of the dioxins (that cause problems of the reproductive and developmental systems, damage to the immune system and are a potent carcinogen) that will remain in the area of restricted use at the Montana Pole Plant, my concern is whether or not the capping that will be done will be adequate to protect public health and the environment. To that end, I have the following questions/concerns:

17. What design, construction and operation requirements will have to be met for the caps?
18. Will protection such as that provided by an active sorbent such as coke or activated carbon be provided? (With clay and AC treatments, bioaccumulation and leakage of dioxins was 67-91%

lower than at the uncapped reference fields. For example, without activated carbon, cap efficiencies drop by 46%. The use of AC decreased both the bioavailability of dioxins present below the cap and the bioaccumulation and leakage of dioxins entering the cap after placement. “Field Experiment on Thin-Layer Capping in Ornefjorden and Eidangerfjorden, Telemark: Functional Response and Bioavailability of Dioxins, 2009-2011,” Schanning, M.T. and I Allan. Norwegian Institute for Water Research, REPORT SNOP 6285-2012, 92 pp, 2012)

19. Could zeolite be used as the cap?
20. Will the soil be treated with cationic surfactants prior to capping?
21. How will the proposed capping of the restricted area at Montana Pole Plant be congruent with the provisions of 40 CFR 300.430?
22. How will the proposed capping of the restricted area at Montana Pole Plant be congruent with the provisions of 55 FR 8703, March 9, 1990?
23. How will the proposed capping of the restricted area at Montana Pole Plant be congruent with the provisions of 63 FR at 28621m May 26, 1998?
24. How will RCRA LDRs apply to the proposed capping of the restricted area?
25. How will the proposed capping of the restricted area at Montana Pole Plant be congruent with the provisions of 40 CFR Part 268?
26. How will the proposed capping of the restricted area at Montana Pole Plant be congruent with the provisions of 40 CFR 264?
27. What treatment will be provided after the site is capped?
28. What institutional controls will be mandated?
29. How will stormwater runoff over the restricted area be controlled?
30. What specific in-situ treatment modalities will be used?
31. To what extent will caps used be impermeable?
32. What will be done regarding the power and sewage lines that run under the plant?

Using capping as the Primary Method of Protection for Dioxin Contaminated Soils at the Pole Plant is very Problematic

Caps are not Permanently Protective of Human Health and the Environment.

27. Dioxin can be remobilized through bio-irrigation. (Dueri, Sibylle, et. al., University of Laval, Quebec, “Modeling the Transport of Heavy Metals through a Capping-Layer: The case Study of the Flood Sediments Deposited in the Saguenay Fjord, Quebec.”)
28. The long term efficacy of caps can be compromised by advection “related to consolidation, diffusion, chemical reactions, and the effect of . . . burrowing activity.” (*Ibid.*)
29. Desiccation can cause cracking of the cap cover. (David Daniel, Professor of Civil Engineering, University of Texas, *Geotechnical Practice for Waste Disposal*)
30. The freeze-thaw cycle can produce changes in the structure and fabric of the cover and a way that increases hydraulic conductivity. (*Ibid.*)
31. Caps are difficult to construct correctly. (*Ibid.*)
32. Caps are difficult to maintain and repair. (*Ibid.*)

33. Erosion is a serious problem. (Jack Caldwell, U.S. Department of Energy, *Principles and Practice of Waste Encapsulation*.)
34. Biointrusion can compromise the effectiveness of the cap. (*Ibid.*)
35. Differential settlement of the cap can cause cracking. (Oweis and Khera, New Jersey Institute of Technology, *Geotechnology of Waste Management*.)
36. Caps require regular and often expensive repair. (*Ibid.*)
37. Stabilization of the cap is a problem. (*Ibid.*)
38. Caps present long-term subsidence and settlement issues. (*Ibid.*)
39. Because of their susceptibility to “weathering, cracking and subsidence” caps have limited long term utility. “Wind, rain, and generalized erosion over time can severely damage even a well-designed . . . cover.” (U.S. Department of Energy, Office of Environmental Management, “Remediation Technology Descriptions: Containment.”) See also: Merritt, Frederick (ed.) *Standard Handbook for Civil Engineers*, McGraw-Hill, New York.

The extensive use of caps as a cleanup method for dioxin contaminated soils at the Montana Pole Plant would do nothing to reduce the toxicity and volume and mobility of dioxin. Caps do nothing to clean up a site. The extensive use of caps as a cleanup method for dioxin contaminated soils at Montana Pole Plant would not provide a permanent remedy. Research clearly indicates that caps may actually make dioxin more bioavailable. The extensive use of caps as a cleanup method for dioxin contaminated soils at Montana Pole would violate the Superfund mandate for treatment over containment. In short, the extensive use of caps for the dioxin contaminated soil would not be protective of human health and the environment.

Problematic Nature of Phytostabilization.

(The dioxin contaminated soil caps will use plants for stabilization and to maintain the integrity of the caps. Plant cover will be a major part of the remediation picture advocated for dioxin contaminated soils. The quality of the vegetation on the caps will directly determine the protective efficacy of the caps. So far vegetative cover for caps in Butte has been somewhat spotty.)

These following comments are meant to show the very problematic nature of phytostabilization, as advocated for the remediation of dioxin contaminated soils at Montana Pole Plant.

7. At a site in Dearing, Kansas that contained contaminants similar to those found at the Montana Pole Plant, only 50% of the plants survived after three years. Of course, those that died recontaminated. A site in Whitewood Creek, South Dakota had only a five percent survival rate with contaminants similar to those founding at the Montana Pole Plant area. (Schnoor, J. I. “Phytoremediation,” *Technology Overview Report, Ground Water Remediation Technologies Analysis Center, Series E, Vol, 1*), October 1997.) Existing caps on the Butte Hill have had similar problems with dying vegetation, most lasting only a season.
8. There is great concern over the permanence of phytostabilized dioxin. (“Clean Tailing Reclamation: Tailing Reprocessing for Sulfide Removal and Vegetation Establishment,” S.R. Jennings and J. Krueger.)
9. Phytosabilization techniques do not adequately take into account plant geochemistry. Failure to do so may actually produce a situation where plants increase the leaching of dioxin. Schwab, A.P., et. al. Kansas State University, “Fate and Transport of Heavy

Metals and Radionuclides in Soil: The Impacts of Vegetation.” The Great Plains/Rocky Mountain Hazardous substance Research Center.)

10. The long-term effectiveness of phytostabilization has not been established in the field. Some field studies show “that some plant species with good greenhouse development, but lower enzymatic activities recorded in their rhizosphere area, were not stable in time and perished after 1 year in the field.” (Petrisor, Ioana, et. al, University of Southern California, “Global Enzymatic Activities—Potential Tools in Assessment of Phytostabilization Strategies.” See also: Brown, Kathryn, “The Green Clean,” *BioScience*, Volume 45, No. 9, October 1995)
11. Droughts or floods can destroy plants. (See: Brown, *Ibid.*)
12. Regulatory Issues: “As of now phytoremediation is too new to be approved by regulatory agencies. Can it clean up the site below action levels? On what scale? Does it create any toxic intermediate or products? Is it cost effect as alternative methods? Does the public accept the technology?” (Zynda, Todd, Michigan State University, “Phytoremediation,” Hazardous Substances Research Center. Michigan State University)

The use of phytostabilization should be minimal compared to removal of contaminated waste to a safe repository. I hope that Dr. Robert Pal of Montana Tech will be involved in the design and implementation of phytostabilization at the Plant.

The Montana Pole Plant Cleanup Relies too Heavily on Institutional Controls that are an Inherently Flawed Approach to Superfund Cleanups.

Superfund’s goal is to clean up hazardous waste sites that pose a threat to human health and the environment. Superfund cleanups should provide a permanent remedy that, in part, reduces the toxicity, mobility, and volume of contaminants. Because Superfund has a strong preference for treatment, the use of institutional controls should normally not be a substitute for “more active measures (e.g. treatment and/or containment of source materials) as the sole remedy. . . .” (40 CFR 300.430(a)(1)(iii)(D). OSWER Directive 9355.0-69, EPA 540-R-97-013 makes essentially this same point that the use of institutional controls should be a remedy of last resort.

To the extent that contamination at a site is really cleaned up, the necessity for institutional controls is minimized. To the extent that institutional controls are used at a site to put waste off-limits, the extent of contamination cleanup is minimized. It is important to remember that the impetus for Superfund in the first place was a failure of institutional controls to prevent the contamination problems and resultant health effects at Love Canal where the institutional controls were not followed. Risk is a function of both toxicity of the materials on site and the degree of exposure to the hazardous waste. (*Effects of Future Land Use Assumptions on Environmental Restoration Decision Making*, DOE, Office of Environmental Policy and Assistance, RCRA/CERCLA Information Brief, DOE/EH-413/9810, July 1998, p.1) Institutional controls depend on limiting exposure to toxic materials and do nothing to lessen the toxicity of these materials. After institutional controls are implemented, the toxic materials that originally triggered the Superfund cleanup are still on site to threaten human health and the environment.

MDEQ’s solution to the problem of dioxin contaminated soils at Montana Pole Plant should be concerned about treating dioxin and, if treatment of the waste is technically impossible,

removing the hazardous waste to a repository where the waste will no longer threaten human health and the environment. “Our obligation is to free subsequent generations of the responsibility for care taking our hazardous residues, not to saddle them with housekeeping chores which, if neglected, will result in the re-pollution of the environment that we worked so hard to clean.” (Jack A. Caldwell and Charles C. Reith, *Principles and Practice of Waste Encapsulation*. Boca Raton: Lewis Publishing Co., 1993, p. 35.) Dioxin that is institutionally controlled is still a permanent threat to human health and the environment.

The cleaner a site is after remediation, the greater the potential land uses for that site. The more contamination left after remediation, the less the potential land uses are for the site. “Citizens have pushed for the highest cleanup standards, arguing that an unrestricted use would allow a wider range of future development at the site.” (Wernstedt, et. al., *Basing Superfund Cleanups on Future Land Uses: Promising Remedy or Dubious Nostrum?*, Resources for the Future, Discussion Paper 98-03, October 1997, p. 17) The institutional controls being supported for Montana Pole Plant by MDEQ would seriously limit productive land uses. The extensive reliance on institutional controls is also contrary to the Superfund mandate of preference for treatment and cleanup over institutional controls that restrict land use in perpetuity. If the goal is to encourage productive land uses after Superfund cleanup, a clean site affords the most encouragement. If the goal is to protect human health and the environment, dioxin must be treated and/or removed.

The thesis of my comments regarding institutional controls is that the use of institutional controls for the Montana Pole Pant site should be minimal. Instead of extensive use of institutional controls to deal with the dioxin contaminants, dioxin at the Montana Pole Plant should, to the greatest technically feasible extent, be removed to a safe repository and treated there using appropriate innovative technologies.

Consider the following detailed argument about the inadequacy of institutional controls.

Institutional Controls are not Effective

A. The EPA itself has found significant problems with the effectiveness of institutional controls. For example, in an article entitled “EPA, Think Tank Studies Show Superfund Land-use Controls Flawed, December 10, 2001” which summarizes “Superfund Report via Inside EPA.com” by Resources for the Future, we find the following conclusions:

1. Institutional Controls are not reliably implemented. The EPA study found that over half of the institutional controls implemented under EPA issued records of decision are mischaracterized and that half of the institutional controls were not implemented according to EPA plans.
2. Institutional Controls are dramatically underfunded.
3. Monitoring of institutional controls is poor. Another study of California Superfund sites entitled: “Analysis of Institutional Controls at California Superfund Sites” by Erwin Tam of the University of California—Berkley found that 30% of the sites had no inspection schedule as required by law and in 63% of the cases it was felt that compromise of the institutionally controlled site was likely.

4. Enforcement of institutional controls is poor.
5. ROD's tend to have "vague or inconsistent references" to institutional controls.

In a study done by English, et. al. of the University of Tennessee entitled *Institutional Controls at Superfund Sites*, (July 1997. Hereinafter cited as *Institutional Controls at Superfund Sites.*), which was funded in part by EPA; the EPA's remedial project managers admit the above listed problems (1-5) with institutional controls. The report concludes: "Perhaps most importantly, the results of this study point to a fairly strong sense of unease on the part of some RPMs with the efficacy of institutional controls. This finding is consistent with discussions in the literature on the efficacy of institutional controls." (p.67) No wonder noted engineers Jack A Caldwell and Charles C. Reith stated in their book *Principles and Practice of Waste Encapsulation*, that "Planners of long-term disposal systems have long recognized the difficulty of maintaining institutional control over property. . . ." (p. 35)

B. "To the extent that responsibility for selecting and maintaining the long-term effectiveness of the remedy will become contingent on the intent and actions of a more diffuse set of institutions—local government, private property laws, current and future property owners, land recordation offices, the courts—the ultimate effectiveness of a remedy to protect human health and the environment will become increasingly difficult to assess." (Hersh, et. al., *Linking Land Use and Superfund Cleanups: Uncharted Territory*, Center for Risk Management, 1997, p.49. Hereinafter cited as: *Linking Land Use.*) If institutional controls become the prime remedy for the dioxin contaminated soil at the Montana Pole Plant, the community will have to live with these controls, effective or not, in perpetuity.

C. The success of institutional controls will depend on changing the way people behave which is very difficult.

Managing human behavior is an extraordinarily difficult task. None of the institutional controls in use, or under consideration for future use, is foolproof. None can reduce to zero the risk of human or environmental exposure to hazardous substances left in place at a site. Nor is there a universal, all-purpose institutional control appropriate for all sites. (Environmental Law Institute, *Protecting Public Health at Superfund Sites: Can Institutional Controls Meet the Challenge*, 1999, p. 13. Hereinafter cited as *Protecting Public Health.*)

The risk of human exposure is considerably less if the toxics are treated to make them non-toxic or if they are removed to a repository where the public cannot come in contact with them.

D. The relationship between land use and toxic exposure is not well understood and can have a great deal of variation.

Institutional Controls have Inherent Limitations

A. Institutional controls do nothing to reduce the toxicity or volume of contaminants. Institutional controls, per se, are not that effective in reducing mobility of toxics off-site. To be protective of human health and the environment, institutional controls would have to last as long as the toxics last. "Substances such as lead, mercury, arsenic, and cadmium will not degrade at all and will remain potentially hazardous unless removed or treated. In order to effectively

protect against exposure to such long-lived risks, institutional controls would need to last essentially for as long as humans are expected to live on the planet.”

(*Protecting Public Health*, p. 13.) No institutional control has this needed level of permanence. If institutional controls are used instead of removal and/or treatment, these controls will have to work in perpetuity. Remember, toxic heavy metals such as those found at the BPSOU do not lose their toxicity over time. Yet, institutional controls are predicated on the designated land use of a sight existing in perpetuity—a flawed assumption. Land use changes are the most frequent changes in a locality.

B. Institutional controls also increase the likelihood that people will unknowingly be exposed to hazardous materials. Leaving contamination on site will always pose a threat of exposure if the institutional control fails. Predicting the long-term efficacy of an institutional control system is very problematic.

C. As we saw with regard to lead exposure, very often, as time passes, it is determined that the contamination in place is more dangerous to human health and/or the environment than originally thought. In such a situation, the in-place institutional controls may not be sufficiently protective of human health and the environment. “Questions then arise about who should be responsible for additional controls or remediation, and about whether residual contaminants should be allowed only if their risks and methods of containment are well understood.” (*Institutional Controls at Superfund Sites*, p. 36.) It is critical that we get the most protective remedy the first time around.

D. Since the implementation of institutional controls depends on people, human error or neglect is a constant problem. After a remedy is selected, the degree of interest in the implementation of the remedy does not match the degree of interest shown during the remedy selection process. “Residual hazardous substances are a classic example of a problem that is not readily apparent, and the tasks associated with implementing institutional controls are unlikely to be the focus of widespread public attention in many cases. Thus, decision makers should plan for a relatively high probability that the person charged with the responsibility to implement an institutional control will fail to do so because that task is not a high priority for that person or because it is a task without a specific deadline and can therefore be postponed indefinitely.” (*Protecting Public Health*, p. 103) The efficacy of an institutional control depends on human judgment and “the judgment of any individual may be questionable in a specific situation and a poor judgment about implementing institutional controls could cause people to be exposed to hazardous substances.” (*Protecting Public Health*, p. 105)

The Meaning and Understanding of Institutional Controls is Problematic.

A. What are the institutions that will be charged with controlling the toxics? How will these institutions coordinate their activities? Who will devise these institutional controls? Who will have enforcement responsibility? How will these controls be enforced? What is meant by controls? To what extent will the nature of these controls be the result of political processes rather than good protective environmental and scientific technology? Who will monitor the institutional controls? How often will the controls be monitored? How will they

be monitored? All of these questions must be satisfactorily answered before the public can have any confidence in the protectiveness of the controls. Yet, in far too many cases where EPA has extensively utilized institutional controls, these questions have never been answered. Nor is there any consensus as to how they should be answered.

B. “When we admit societal values, power, political leverage, and notions of rights and duties into the picture, it becomes difficult to see ‘controls’ as anything but contested, and hence problematic. For institutional controls are not stagnant features of a remedy but are made and unmade in the course of experience by regulatory statutes, by the acuity of government oversight, by negotiations at planning board meetings, by the attitudes of bankers, developers, and others involved in real estate, by the limitations of scientific understanding of the health risks posed by toxic chemicals, by the vast and evolving corpus of real property law, by public trust in government or the lack thereof, and, in a broader sense by the constellation of rights and responsibilities that inform a societal ethic.” (*Linking Land Use*, p. 52. See also: T. Beatley, *Ethical Land Use: Principles of Policy and Planning* (Baltimore, MD: Johns Hopkins Press, 1994 and R. Platt, *Land Use and Society: Geography, Law and Public Policy* (Washington, D.C.: Island Press, 1996)

Even if there were some agreement on the nature and role of institutional controls, that agreement would be fleeting.

Legal Issues Limit the Effectiveness of Institutional Controls

A. Another problem complicating the use of institutional controls are the courts. The courts can potentially play a significant role on land use decisions and land use decisions can be very litigious.

“Although the courts try not to make substantive zoning decisions, judicial attacks on local land use regulations are well documented in case law and in the planning literature and constitute yet another source of uncertainty to the effective working of institutional controls at Superfund sites. In view of the wide variation in the decisions of state and appellate courts concerning the limits of police power to regulate land use and the need for Constitutional protection for the individual, it is easy to envisage the possibility that an owner of a site that is encumbered with a use restriction may challenge and successfully invalidate an institutional control, such as a zoning restriction, on the grounds that the restriction will cause a severe burden and, as such, constitutes a taking of private property by the government.” (*Linking Land Use*, p. 64)

B. The NCP does not clearly specify the legal authority for institutional controls. Because there are no detailed statutory specifications of institutional controls, institutional controls are often left to the end of the remedy selection process where public input is minimal. Leaving them to the end is problematic in that: “If you leave institutional controls to the last and you can’t get them implemented, then you’re stuck. You’re at a dead end rather than the destination of the record of decision (ROD).” (Claudia Kerbawy, *op.cit.*, p. 53)

C. On a practical level, it is unclear who should monitor and enforce the institutional controls. RODs usually have little specificity regarding the implementation and monitoring of institutional controls. Often the specification of the nature and types of institutional controls is very general. Questions abound regarding what kind of monitoring will be performed, who will perform the monitoring, how and what type of enforcement will occur, what will be the frequency of the monitoring, and who is responsible for maintaining the protectiveness of the institutional control arrangements. The technical remedy is determined first and then institutional controls are developed to protect the remedy. Yet, it is often difficult to get acceptance by property owners or PRPs after the ROD is issued

D. Given that issues related to institutional land use/property control are not based in federal law but are based in state property laws or the local police power, federal control of institutional controls on the local level is very limited. CERCLA provides EPA with oversight authority over institutional controls that are part of the ROD remedy but CERCLA provides no mechanisms to enforce that control. Every five years, EPA can amend a remedy when contaminants are left in place, but during that five-year period the supervision of institutional controls is with the local government. Much to compromise a remedy can happen in five years. Moreover, there are serious proposals in Congress to remove the five-year review process. Hence, federal supervision of institutional controls is very problematic and could disappear altogether.

E. It is very problematic whether an institutional control on a current owner of a particular property would bind subsequent owners of that property. “Can third parties (for example, community groups or the local government) enforce a restriction at a site if the property owner fails to comply with the control and the holder of the easement, for example, (EPA, a PRP, the state government, or a local government if signatory to the agreement) fails to act properly? (*Linking Land Use*, p. 57) In *Environmental Regulation of Real Property*, N. Robinson comments that institutional control covenants are very complicated and that “they often defeat the attempts of parties to write covenants which will be enforceable against successors.” (pp. 6-16) For example, the form of future property ownership must be similar to the existing type of property ownership for an institutional control restriction to continue in force. Once a property is sold to a new owner, monitoring of what the new owner does on the property is diffuse if it exists at all.

What happens in a commercial venture if the purchaser of the property goes bankrupt? Who is responsible for the institutional control restrictions on the property? Who will enforce these restrictions? State laws regulating the use property are Byzantine.

“The common law tradition of different types of ownership could limit long-term effectiveness of (institutional controls’) reliability if they fail to bind third parties to the agreements worked out in the consent decree, and the question of authority—who holds an easement and on what legal basis can the government or some other entity challenge noncompliance with the easement or deed restriction—is, again, open to interpretation. These issues suggest that proprietary controls, negotiated between PRP/site owners and government (federal, state, local) may be insufficient by themselves to effectively ensure the long-term safety of the public from residual contamination. Their reliability hinges on how carefully they are devised, the authority and willingness of the party holding the rights to use them, and the willingness

of a property owner to comply.” (*Linking Land Use*, p. 58)

F. Multiple owners or multiple use of a site also compromise the ability of government to police institutional controls.

G. The “touch and concern” doctrine can limit the efficacy of real covenants in the institutional control process. “Equitable servitudes” also are limited in their effectiveness by the “touch and concern” requirement.

H. Liability under institutional controls is problematic.

“When institutional controls are created, it is important to determine who will be liable in the event they fail. Even if the EPA has entered into a consent decree at the time of the initial site remediation releasing PRPs from liability for residual contamination, questions remain about liability if the institutional controls are violated. For example: If the current property owners allow development that violates use restrictions, are they liable, are the original PRPs liable, or both? If people are harmed by such a violation, would they be able to sue the current property owners, the original PRPs or both?” (*Institutional Controls at Superfund Sites*, p. 34)

I. Another difficulty is that land use controls are “vulnerable to changing legal interpretations about the nature of property rights.” (Wernstedt, et. al., *Basing Superfund Cleanups on Future Land Uses: Promising Remedy of Dubious Nostrum?*, Resources for the Future, Discussion Paper 98-03, October 1997, p. 16) For example, if the courts expand the scope of takings decisions to increase the extent to which government regulations are viewed as a “taking” then the efficacy of institutional controls will be diminished.

Summary of the Problems with Institutional Controls

19. Institutional controls do not meet the Superfund mandate of really cleaning up a site. To clean up means to make free of contamination.
20. Institutional controls are not permanent remedies. Rather, institutional controls permanently leave pollutants in place.
21. Institutional controls do nothing to reduce the toxicity of the hazardous materials. Lead, arsenic, mercury, and cadmium don’t naturally attenuate over time, but keep their toxicity indefinitely.
22. Institutional controls are designed, implemented and monitored poorly.
23. Institutional controls have inherent enforcement problems.
24. Institutional controls have severe legal problems that work against effective reduction of the threats to human health and the environment posed by toxic materials.
25. Institutional controls are ineffective.

26. Institutional controls for a Superfund site are usually the result of a defective process that limits public participation and which leads to a haphazard development of institutional controls for a particular site.
27. Institutional controls are poorly understood and poorly defined.

Institutional Controls Problems Summary

The use of institutional controls at the Montana Pole Plant site should not be a substitute for real, permanent cleanup. Institutional controls do nothing to clean up a site. Because institutional controls rely on the flawed premise that the way to prevent human exposure to toxic substances is to remove humans from the toxic substance by attempting to change human behavior patterns rather than by removing the substance from the humans which would allow citizens to pursue their activities without being threatened by toxics, the extensive use of institutional controls is bound to fail. Institutional controls also have significant design, development, implementation, monitoring and enforcement problems. Institutional controls are not effective. Legal problems abound with institutional controls. Institutional controls are not a permanent solution to the toxics problem. To the maximum extent possible, the contaminants found Montana Pole Plant site should either be treated on site or, if on-site treatment is not possible, be removed from the area to a safe repository where they can be treated.

ATTACHMENT V.4

From: [REDACTED] <[REDACTED].com>

Sent: Tuesday, March 10, 2020 5:31 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment Montana Pole Plant

Health Effects

The dioxin TCDD, or [Mutagen: Talking Glossary of Genetic Terms](#), is a known cancer-causing agent, and other DLCs are known to cause cancer in laboratory animals. Additionally, dioxin exposure has been linked to a number of other diseases, including type 2 diabetes, ischemic heart disease, and an acne-like skin disease called chloracne, a hallmark of dioxin exposure.

Dioxins can cause developmental problems in children, lead to reproductive and infertility problems in adults, result in miscarriages, damage the immune system, and interfere with hormones.

Exposure to dioxins has widespread effects in nearly every vertebrate species, at nearly every stage of development, including in the womb.

National Institute of Environmental Health Science

Medical News Today

Problems that have been linked to dioxins exposure include:

- birth defects
- inability to maintain pregnancy
- decreased fertility
- reduced sperm count
- endometriosis
- learning disabilities
- immune system suppression
- lung problems
- skin disorders
- lowered testosterone levels
- ischemic heart disease
- type 2 diabetes

ATTACHMENT V.5

From: [REDACTED] <[REDACTED].com>

Sent: Tuesday, March 10, 2020 5:31 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment Montana Pole Plant

Dioxin is mobile in soils such as those at the Montana Pole Plant. The ROD itself says that it is possible for dioxin in soils to migrate. (Page 14) There are present in the Montana Pole Plant soils co-contaminants that can mobilize dioxin. In addition, the caps as presently proposed will not prevent surface water and other contaminants from leaching down and mobilizing dioxin. Given the problems of caps with bio-irrigation, advection, desiccation, erosion, weathering, bio-intrusion and stabilization, the dioxin in the soil will be mobilized. Only in a pure lab setting does dioxin remain non-mobile. Certainly the Montana Pole Plant is not a pure lab setting. (See: Dioxin reservoirs in southern Viet Nam--A legacy of Agent Orange by Divernychuk, et al in *Chemosphere* 47 (2002) 117-137. Similar findings are reported in the following:

- 1. Soil-Plant Transfer of Polychlorinated Dibenzo-p-dioxins and Dibenzofurans to Vegetables of the Cucumber Family (Cucurbitaceae)** Anke. Huelster , Jochen F. Mueller , Horst. Marschner *Environ. Sci. Technol.*, 1994, 28 (6), pp 1110–1115 **DOI:** 10.1021/es00055a021 **Publication Date:** June 1994 (Article: Indicates that dioxin is mobilized in soils as the result of plant activity. Given that there will only be a 16 inch cap over dioxin contaminated soils and the cap will have vegetative cover, the vegetative cover will absorb dioxin and bring it to the surface.)
- 2. Sorption of 2,3,7,8-tetrachlorodibenzo-p-dioxin to soils from water/methanol mixtures** Richard W. Walters , Annette. Guiseppi-Elie *Environ. Sci. Technol.*, 1988, 22 (7), pp 819–825 **DOI:** 10.1021/es00172a012 **Publication Date:** July 1988
- 3. Study by U.S. Dept. of Agriculture indicated that dioxin is only immobile in soils devoid of other organic material. If any organic co-solvents, as are present at the Pole Plant, are in the soil, mobility will occur.**
- 4. SUBSTANTIAL MIGRATION OF DIOXINS IN AGROCHEMICAL FORMULATIONS,** Grant, Sharon, Mortimer, Munro, Stevenson, Gavin, Malcolm, Don and Gaus, Caroline, The University of Queensland (National Research Centre for Environmental Toxicology (EnTox)), **39** *However, the presence of co-contaminants can act as transport facilitators for otherwise low mobility organic compounds (LMOCs) These results highlight that the paradigm of LMOCs being non mobile in soils should be considered carefully together with application specific and environmental factors which may have the ability to considerably change the predicted environmental fate of these chemicals.*
(This article supports the above mentioned study by the U.S. Department of Agriculture that if, as we find at the Pole Plant, co-contaminants are present, dioxin does become mobile in soil.

The point is that since the remedy for the Pole Plant was changed from one of active treatment to containment, co-contaminants that will make dioxin mobile in soil will be present.

5. *Assessment of Dioxin Contamination at Sawmill Sites: A Report to the Ministry for the Environment by Tonkin & Taylor Ltd and SPHERE, Prepared for the New Zealand Ministry for the Environment*

October 2008 (conclusions are similar to the one's I included in my earlier email to you today, i.e. that dioxin is mobile in both soil and water.

Also, data presented by the MDEQ at a CTEC meeting indicated that dioxin is present in the recovery trenches at the Pole Plant. If dioxin isn't mobile in soil at the Pole Plant, how did the dioxin get in the recovery trenches? Another point that was made at the CTEC meeting: MDEQ is in charge of the cleanup in Missoula of the White Pine Sash site. This site was a wood treatment facility similar to Montana Pole. The MDEQ acknowledges at this site that dioxin can be mobile in soils. Why not acknowledge the same at Montana Pole? Finally, the dioxin levels that we are now seeing in groundwater at the Montana Pole Plant were not supposed to have been reached until 200,000 years from now according to MDEQ. Why, if dioxin is not mobile, are we seeing dioxin now that we should not have seen for 200,000 years?

ATTACHMENT V.7

From: [REDACTED] <[REDACTED].com>

Sent: Tuesday, March 10, 2020 5:31 AM

To: [REDACTED] <[REDACTED]@mt.gov>; [REDACTED] <[REDACTED]@epa.gov>

Cc: [REDACTED] <[REDACTED]@yahoo.com>; [REDACTED] <[REDACTED]@mt.gov>

Subject: [EXTERNAL] Additional Public Comment Montana Pole Plant

Reliance on Caps and Institutional Controls is Inadequate to Protect Human Health at the Montana Pole Plant

[REDACTED]
Butte, Montana

Caps are not Permanently Protective of Human Health and the Environment.

Problems with caps:

40. Toxics can be remobilized through bio-irrigation. (Dueri, Sibylle, et. al., University of Laval, Quebec, "Modeling the Transport of Heavy Metals through a Capping-Layer: The case Study of the Flood Sediments Deposited in the Saguenay Fjord, Quebec.")
41. The long term efficacy of caps can be compromised by advection "related to consolidation, diffusion, chemical reactions, and the effect of . . . burrowing activity." (*Ibid.*)
42. Desiccation can cause cracking of the cap cover. (David Daniel, Professor of Civil Engineering, University of Texas, *Geotechnical Practice for Waste Disposal*)
43. The freeze-thaw cycle can produce changes in the structure and fabric of the cover and a way that increases hydraulic conductivity. (*Ibid.*)
44. Caps are difficult to construct correctly. (*Ibid.*)
45. Caps are difficult to maintain and repair. (*Ibid.*)
46. Erosion is a serious problem. (Jack Caldwell, U.S. Department of Energy, *Principles and Practice of Waste Encapsulation.*)
47. Biointrusion can compromise the effectiveness of the cap. (*Ibid.*)
48. Differential settlement of the cap can cause cracking. (Oweis and Khera, New Jersey Institute of Technology, *Geotechnology of Waste Management.*)
49. Caps require regular and often expensive repair. (*Ibid.*)
50. Stabilization of the cap is a problem. (*Ibid.*)
51. Caps present long-term subsidence and settlement issues. (*Ibid.*)
52. Because of their susceptibility to "weathering, cracking and subsidence" caps have limited long term utility. "Wind, rain, and generalized erosion over time can severely damage even a well-designed . . . cover." (U.S. Department of Energy, Office of Environmental Management, "Remediation Technology Descriptions: Containment.") See also: Merritt, Frederick (ed.) *Standard Handbook for Civil Engineers*, McGraw-Hill, New York.

The extensive use of caps as a cleanup method for Montana Pole Plant would do nothing to reduce the toxicity and volume and mobility of contaminants. Caps do nothing to clean up a site. The extensive use of caps as a cleanup method for Montana Pole Plant would not provide a permanent remedy. The extensive use of caps as a cleanup method for Montana Pole Plant would violate the Superfund mandate for treatment over containment. In short, the extensive use of caps for the Montana Pole Plant would not be protective of human health and the environment.

Institutional Controls—The Public should be concerned about too great a Reliance on Institutional Controls for the ESD as currently being proposed for Montana Pole Plant.

Institutional controls per se do nothing to reduce the mobility, toxicity, or volume of contaminants. Institutional controls do nothing to clean up a site. The institutional controls being considered for Montana Pole Plant would seriously limit productive land uses and greatly compromise the property rights of owners to use their land as they determine. The extensive reliance on institutional controls is also contrary to the Superfund mandate of preference for treatment over restricted land use. Institutional controls do nothing to treat a site. The EPA's own document "Rules of Thumb for Superfund Remedy Selection" states that the law mandates a clear preference for treatment over all other approaches. "EPA expects to use treatment to address the principal threats posed by a site. . . ." [40 CFR 300.430(a)(1)(iii)(A)]. The above document also notes: "Institutional controls. . . generally shall not substitute for more active measures. . . ." (pp. 12-13)

The EPA itself has found significant problems with institutional controls at its other sites. In an article entitled "EPA, Think Tank Studies Show Superfund Land-use Controls Flawed, December 10, 2001" which summarizes "Superfund Report via Inside EPA.com" by Resources for the Future, we find these conclusions, *reached by the EPA itself*, which due to their significance, I will quote at length:

"EPA and environmental think tank studies have shown that the federal and state governments' land-use restrictions at Superfund sites, known as institutional controls (IC), are seriously flawed, with an agency study showing the controls are not reliably implemented and the think tank report finding the controls are dramatically under-funded."

"During a November 27 land use control summit, sponsored by the International City/County Management Association (ICMA), EPA officials and the Environmental Law Institute (ELI), outlined numerous shortcomings they have found with EPA's IC monitoring and enforcement efforts nationwide. While EPA released the results of a study showing EPA has failed to ensure Superfund ICs are reliably implemented, and ELI study indicates that EPA's ICs are dramatically under-funded."

"Bruce Means, of EPA's Federal Facilities Restoration and Reuse Office, told attendees that preliminary studies show that half of the ICs implemented under Superfund records of decisions (ROD) were mischaracterized. During a study of RODs conducted during 1999 and 2000, the

agency found that half of the ICs established under RODs were not implemented as the agency had planned.”

“And Jay Pendergrass of ELI outlined the preliminary findings of ELI’s study of state’s IC programs, which showed that the programs are severely under-funded.”

“In a draft version of the report, Pendergrass found that state environmental programs are underfunded and as a result the sites allocate very little time on IC implementation. The funding and staffing shortfall ‘raises concerns about whether [ICs] are implemented as intended and [are] as protective as intended.’”

“An ICMA source agrees that EPA has serious problems with its IC program, saying that the agency has many RODs with vague or inconsistent references to such controls.”
(pages 1-2)

The greater the cleanup of the Montana Pole Plant the more the site can be used productively. The less cleanup of the Montana Pole Plant, the less the site can be used for residences and recreational uses. Given the EPA’s admission that institutional controls have failed it in the past, it is amazing that the remedies listed in the ESD for Montana Pole Plant call for such extensive use of institutional controls.

Other Problems with Institutional Controls:

- aa. There is a tendency not to implement institutional controls as time passes. Frequently institutional control mandates are not carried to completion.
- bb. The effectiveness of institutional controls usually depends upon the ability, personnel and resources of the local government to implement. Often local governments do not have the personnel or resources to devote to the implementation and monitoring of institutional controls. Given the national administration’s proposed cutbacks in Superfund allocations, resources will be increasingly unavailable on the national level to monitor implementation and effectiveness of institutional controls. Certainly the financial capacity of Butte’s local government to implement and monitor institutional controls is greatly limited. Nowhere does the EPA’s comprehensively address the above issue.
- cc. “Institutional controls rely heavily on humans to implement, oversee, and administer them. It is human nature to ignore tasks that no one else seems to care about or where the purpose is not readily apparent. Residual hazardous substances are a classic example of a problem that is not readily apparent.” (“Protecting Public Health at Superfund Sites: Can Institutional Controls Meet the Challenge?” Environmental Law Institute, p. 2)
- dd. Although EPA must review the remedy every five years, the frequency of this review process may be insufficient to detect the failure of institutional controls.
- ee. The use of education as part of the institutional controls strategy is a substantial part of the EPA’s approach to implementing institutional controls. Research of previous remedies under Superfund indicates that education programs fail to materialize.
- ff. “In addition to the direct costs of implementing institutional controls, their use can impose substantial indirect costs on communities, property owners, prospective purchasers and developers by limiting the ways a site may be used. The burden of the restrictions on use of the site falls on the property owner and the community, with the owner reaping potentially lower profits from use of the property and the community

receiving lower social benefits from the allowed uses than would have been possible if no restrictions existed.” (ELI, *Ibid.*)

- gg. Because the sites where institutional controls will be implemented will not be cleaned up and will present a continuing potential threat to human health, these sites will be off limits to development in perpetuity. It is difficult to see how the use of institutional controls meshes with the goals of the EPA’s Superfund Redevelopment Initiative.
- hh. It is impossible to determine future possible land uses for the site nor is it possible to predict unanticipated land uses. (See: “Linking Land Use and Superfund Cleanups: Uncharted Territory,” by Probst, Hersh, Wernstedt and Mazurek, *Summary of Findings*, RFF, p. 1)
- ii. “Institutional controls have more problems than just risk miscalculation. Breaches in the site because of future construction, or even animals may cause the control to fail. The lack of a required contingency plan, would not account for new remedies, new information, or failed institutional controls negatively impacts the effectiveness of the treatment. Institutional memory loss was well is an important factor. This memory loss occurs when a party decides to breach the original institutional control without its own knowledge. In fact, in the ICMA (International City/County Management Association) study, the majority of respondents (63%) said that breaches in the institutional controls on a site were highly or somewhat likely. Following up on that question, 30% of the respondents reported that no formal inspection schedule was set up to evaluate the site as require by law.” (Erwin Tam, Environmental Science and Economics, UC Berkeley, “Analysis of Institutional Controls at California Superfund Sites.”)
- jj. “Concern has been expressed about the long-term viability of institutional controls as a remediation tool. For example, they may be forgotten; enforcement agencies may not effectively review properties or land users’ actions; or land users simply may take their chances. Decision makers should weigh the full costs of such options, including capital costs, costs of long-term sampling and analysis, and costs of replacing equipment, as well as concerns about potential long-term risks associated with contaminants left in place, against the cost options that would remove the contaminants completely. Many local governments do not yet have the capacity and resources necessary to meet the challenges of long-term stewardship.” (“Understanding the Role of Institutional Controls at Brownfields Sites: Major Concepts and Issues.”)
- kk. Because institutional controls leave large amounts of contaminants in place, institutional controls will have to be perpetual. Who is to say what anticipated land uses come up for an institutionally controlled area? For example, fifty years after the record of decision for Montana Pole Plant is implemented, the contaminants will still be there threatening human health and the environment, but will the will be there to restrict land uses in order to prevent the release of contaminants. “Institutional controls ‘work’ only if they are complied with. And while this is true of any site remedy, institutional controls require monitoring and enforcement over long time periods.” (“Linking Land Use and Superfund Cleanups: Uncharted Territory, Probst, et al., Resources for the Future Center for Risk Management.) Will the will to enforce institutional controls exist fifty to a hundred years in the future?
- ll. Legal, social and political pressures limit the effectiveness of institutional controls. (*Ibid.*)
- mm. The long-term effectiveness of institutional controls is unknown. “There has, however, been little investigation of what happens at sites on the National Priorities List

(NPL) when land use plays a prominent role in the remedy selection process. There also has been little analysis of what institutions are involved in making land use decisions and maintaining land use restrictions over time. It is unclear what legal mechanisms are most effective, what institutions will be responsible for enforcing institutional controls, and who's going to pay for these additional responsibilities. We need to be able to answer these questions if land use-based remedies are to be protective over the long term." (*Ibid.*)

"Planners of long-term disposal systems have long recognized the difficulty of maintaining institutional control over property. . . ." (Jack A. Caldwell and Charles C. Reith, *Principles and Practice of Waste Encapsulation*, 1993, p. 35)

More on the inadequacy of Institutional Controls

Superfund's goal is to clean up hazardous waste sites that pose a threat to human health and the environment. Superfund cleanups should provide a permanent remedy that, in part, reduces the toxicity, mobility, and volume of contaminants. Because Superfund has a strong preference for treatment, the use of institutional controls should normally not be a substitute for "more active measures (e.g. treatment and/or containment of source materials) as the sole remedy. . . ." (40 CFR 300.430(a)(1)(iii)(D). OSWER Directive 9355.0-69, EPA 540-R-97-013 makes essentially this same point that the use of institutional controls should be a remedy of last resort.

To the extent that contamination at a site is really cleaned up, the necessity for institutional controls is minimized. To the extent that institutional controls are used at a site to put waste off-limits, the extent of contamination cleanup is minimized. It is important to remember that the impetus for Superfund in the first place was a failure of institutional controls to prevent the contamination problems and resultant health effects at Love Canal where the institutional controls were not followed. Risk is a function of both toxicity of the materials on site and the degree of exposure to the hazardous waste. (*Effects of Future Land Use Assumptions on Environmental Restoration Decision Making*, DOE, Office of Environmental Policy and Assistance, RCRA/CERCLA Information Brief, DOE/EH-413/9810, July 1998, p.1) Institutional controls depend on limiting exposure to toxic materials and do nothing to lessen the toxicity of these materials. After institutional controls are implemented, the toxic materials that originally triggered the Superfund cleanup are still on site to threaten human health and the environment.

Superfund should be concerned about treating hazardous wastes so that they are no longer toxic and, if treatment of the waste is technically impossible, removing the hazardous waste to a repository where the waste will no longer threaten human health and the environment. "Our obligation is to free subsequent generations of the responsibility for caretaking our hazardous residues, not to saddle them with housekeeping chores which, if neglected, will result in the repollution of the environment that we worked so hard to clean." (Jack A. Caldwell and Charles C. Reith, *Principles and Practice of Waste Encapsulation*. Boca Raton: Lewis Publishing Co., 1993, p. 35.) Wastes that are institutionally controlled are still a permanent threat to human health and the environment.

The cleaner a site is after remediation, the greater the potential land uses for that site. The more contamination left after remediation, the less the potential land uses are for the site. "Citizens have pushed for the highest cleanup standards, arguing that an unrestricted use would allow a wider range of future development at the site." (Wernstedt, et. al., *Basing Superfund Cleanups on Future Land Uses: Promising Remedy or Dubious Nostrum?*, Resources for the Future, Discussion Paper 98-03, October 1997, p. 17) The institutional controls being considered in the ESD for Montana Pole Plant would seriously limit productive land uses and greatly compromise the property rights of owners. The extensive reliance on institutional controls is also contrary to the Superfund mandate of preference for treatment and cleanup over institutional controls that restrict land use in perpetuity. If the goal is to encourage productive land uses after Superfund cleanup, a clean site affords the most encouragement. If the goal is to protect human health and the environment, these toxic materials must be treated and/or removed.

The thesis of my comments is that the use of institutional controls for Montana Pole Plant should be minimal. Instead of extensive use of institutional controls to deal with the Montana Pole Plant contaminants be removed to a safe repository
The reasons for this conclusion are:

28. Institutional controls do not meet the Superfund mandate of really cleaning up a site. To clean up means to make free of contamination.
29. Institutional controls are not permanent remedies. Rather, institutional controls permanently leave pollutants in place.
30. Institutional controls do nothing to reduce the toxicity of the hazardous materials. Lead, arsenic, mercury, and cadmium don't naturally attenuate over time, but keep their toxicity indefinitely.
31. Institutional controls are designed, implemented and monitored poorly.
32. Institutional controls have inherent enforcement problems.
33. Institutional controls have severe legal problems that work against effective reduction of the threats to human health and the environment posed by toxic materials.
34. Institutional controls are ineffective.
35. Institutional controls for a Superfund site are usually the result of a defective process that limits public participation and which leads to a haphazard development of institutional controls for a particular site.
36. Institutional controls are poorly understood and poorly defined.

Institutional Controls are not Effective

A. The EPA itself has found significant problems with the effectiveness of institutional controls. For example, in an article entitled "EPA, Think Tank Studies Show Superfund Land-use Controls Flawed, December 10, 2001" which summarizes "Superfund Report via Inside EPA.com" by Resources for the Future, we find the following conclusions:

1. Institutional Controls are not reliably implemented. The EPA study found that over half of the institutional controls implemented under EPA issued records of decision are mischaracterized and that half of the institutional controls were not implemented according to EPA plans.
2. Institutional Controls are dramatically underfunded.

3. Monitoring of institutional controls is poor. Another study of California Superfund sites entitled: “Analysis of Institutional Controls at California Superfund Sites” by Erwin Tam of the University of California—Berkeley found that 30% of the sites had no inspection schedule as required by law and in 63% of the cases it was felt that compromise of the institutionally controlled site was likely.
4. Enforcement of institutional controls is poor.
5. ROD’s tend to have “vague or inconsistent references” to institutional controls.

In a study done by English, et. al. of the University of Tennessee entitled *Institutional Controls at Superfund Sites*, (July 1997. Hereinafter cited as *Institutional Controls at Superfund Sites.*), which was funded in part by EPA; the EPA’s remedial project managers admit the above listed problems (1-5) with institutional controls. The report concludes: “Perhaps most importantly, the results of this study point to a fairly strong sense of unease on the part of some RPMs with the efficacy of institutional controls. This finding is consistent with discussions in the literature on the efficacy of institutional controls.” (p.67) No wonder noted engineers Jack A Caldwell and Charles C. Reith stated in their book *Principles and Practice of Waste Encapsulation*, that “Planners of long-term disposal systems have long recognized the difficulty of maintaining institutional control over property. . . .” (p. 35)

B. “To the extent that responsibility for selecting and maintaining the long-term effectiveness of the remedy will become contingent on the intent and actions of a more diffuse set of institutions—local government, private property laws, current and future property owners, land recordation offices, the courts—the ultimate effectiveness of a remedy to protect human health and the environment will become increasingly difficult to assess.” (Hersh, et. al., *Linking Land Use and Superfund Cleanups: Uncharted Territory*, Center for Risk Management, 1997, p.49. Hereinafter cited as: *Linking Land Use.*) If institutional controls become a prime remedy for the Montana Pole Plant, the community will have to live with these controls, effective or not, in perpetuity.

C. The success of institutional controls will depend on changing the way people behave which is very difficult.

Managing human behavior is an extraordinarily difficult task. None of the institutional controls in use, or under consideration for future use, is foolproof. None can reduce to zero the risk of human or environmental exposure to hazardous substances left in place at a site. Nor is there a universal, all-purpose institutional control appropriate for all sites. (Environmental Law Institute, *Protecting Public Health at Superfund Sites: Can Institutional Controls Meet the Challenge*, 1999, p. 13. Hereinafter cited as *Protecting Public Health.*)

The risk of human exposure is considerably less if the toxics are treated to make them non-toxic or if they are removed to a repository where the public cannot come in contact with them.

D. The relationship between land use and toxic exposure is not well understood and can have a great deal of variation.

Institutional Controls have Inherent Limitations

A. Institutional controls do nothing to reduce the toxicity or volume of contaminants. Institutional controls, per se, are not that effective in reducing mobility of toxics off-site. To be protective of human health and the environment, institutional controls would have to last as long as the toxics last. “Substances such as lead, mercury, arsenic, and cadmium will not degrade at all and will remain potentially hazardous unless removed or treated. In order to effectively protect against exposure to such long-lived risks, institutional controls would need to last essentially for as long as humans are expected to live on the planet.” (*Protecting Public Health*, p. 13.) No institutional control has this needed level of permanence. If institutional controls are used instead of removal and/or treatment, these controls will have to work in perpetuity. Remember, toxics such as those found at the Montana Pole Plantme do not lose their toxicity over time. Yet, institutional controls are predicated on the designated land use of a sight existing in perpetuity—a flawed assumption. Land use changes are the most frequent changes in a locality.

B. Institutional controls also increase the likelihood that people will unknowingly be exposed to hazardous materials. Leaving contamination on site will always pose a threat of exposure if the institutional control fails. Predicting the long-term efficacy of an institutional control system is very problematic.

C. As we saw with regard to lead exposure, very often, as time passes, it is determined that the contamination in place is more dangerous to human health and/or the environment than originally thought. In such a situation, the in-place institutional controls may not be sufficiently protective of human health and the environment. “Questions then arise about who should be responsible for additional controls or remediation, and about whether residual contaminants should be allowed only if their risks and methods of containment are well understood.” (*Institutional Controls at Superfund Sites*, p. 36.) It is critical that we get the most protective remedy the first time around.

D. Since the implementation of institutional controls depends on people, human error or neglect is a constant problem. After a remedy is selected, the degree of interest in the implementation of the remedy does not match the degree of interest shown during the remedy selection process. “Residual hazardous substances are a classic example of a problem that is not readily apparent, and the tasks associated with implementing institutional controls are unlikely to be the focus of widespread public attention in many cases. Thus, decision makers should plan for a relatively high probability that the person charged with the responsibility to implement an institutional control will fail to do so because that task is not a high priority for that person or because it is a task without a specific deadline and can therefore be postponed indefinitely.” (*Protecting Public Health*, p. 103) The efficacy of an institutional control depends on human judgment and “the judgment of any individual may be questionable in a specific situation and a poor judgment about implementing institutional controls could cause people to be exposed to hazardous substances.” (*Protecting Public Health*, p. 105)

The Meaning and Understanding of Institutional Controls is Problematic.

A. What are the institutions that will be charged with controlling the toxics? How will these institutions coordinate their activities? Who will devise these institutional controls? Who will have enforcement responsibility? How will these controls be enforced?

What is meant by controls? To what extent will the nature of these controls be the result of political processes rather than good protective environmental and scientific technology? Who will monitor the institutional controls? How often will the controls be monitored? How will they be monitored? All of these questions must be satisfactorily answered before the public can have any confidence in the protectiveness of the controls. Yet, in far too many cases where EPA has extensively utilized institutional controls, these questions have never been answered. Nor is there any consensus as to how they should be answered.

B. “When we admit societal values, power, political leverage, and notions of rights and duties into the picture, it becomes difficult to see ‘controls’ as anything but contested, and hence problematic. For institutional controls are not stagnant features of a remedy but are made and unmade in the course of experience by regulatory statutes, by the acuity of government oversight, by negotiations at planning board meetings, by the attitudes of bankers, developers, and others involved in real estate, by the limitations of scientific understanding of the health risks posed by toxic chemicals, by the vast and evolving corpus of real property law, by public trust in government or the lack thereof, and, in a broader sense by the constellation of rights and responsibilities that inform a societal ethic.” (*Linking Land Use*, p. 52. See also: T. Beatley, *Ethical Land Use: Principles of Policy and Planning* (Baltimore, MD: Johns Hopkins Press, 1994 and R. Platt, *Land Use and Society: Geography, Law and Public Policy* (Washington, D.C.: Island Press, 1996)

Even if there were some agreement on the nature and role of institutional controls, that agreement would be fleeting.

The Effectiveness of Institutional Controls is Compromised by a Dependency on Local Government.

A. It is impossible for local government to predict future land uses. Most land use planning is done in a very piecemeal, incremental fashion. One of the great faults of incremental decision-making is its inability to predict accurately or to plan for possible future events that differ from the present.

B. Often the development of institutional controls occurs after the record of decision has been determined. This later development limits public participation and limits local government input into the design and implementation of institutional controls. If institutional controls are imposed on local government after secret consent decree negotiations, local governments may well see no compelling reason to be pro-active in enforcing or monitoring these controls.

C. Often the development of specific institutional controls is more of a political process rather than a technical or scientific process. The essence of the political process is compromise which compromises may not be protective of human health and the environment. “When institutional controls are used to assure protection of human health and the environment, the technical adequacy of the remedy becomes dependent on a number of non-technical factors over which EPA has little influence. These include: the efficacy of local government administration; the

consistent application of zoning ordinances; the ability of private property restrictions (such as easements and restrictive covenants) to bind both current and successive users of the sites; and prompt enforcement.” (*Linking Land Use*, p. 7.) Land use planning on the local level is often not systematic but results from the compromises that are endemic to the political process. Often land use planning decisions represent the interests of developers, bankers, real estate agents, and etc. rather than the interests of the general public.

D. The lack of consistency in developing and applying land use controls on the local level means that institutional controls are not very dependable or reliable. “In no area of American law are there such frequent requests for amendments to the law (rezoning requests) or minor revisions to the law under the guise of an administrative actions (variance, special exemptions, and so forth.” (*Linking Land Use*, p. 61) In fact changing zoning is the most common form of land use action which local government takes. (*Ibid.*, p. 62) E.D. Kelly in “Zoning” states this process is inherently “unpredictable and unfair.” (Found in *The Practice of Local Government Planning*, 2nd ed., ed. F.S. So and J. Getzels (Washington, D.C.: ICMA Training Institute, 1988) Variances are also frequently given. B. Collingsworth in *The Political Culture of Planning* notes: “Various studies have convincingly shown that boards of adjustment (or appeal) commonly operate according to their own sense of what is right, with little regard to the law, or even their local planning department.” (New York: Routledge, 1993, p. 7) English, *et. al.* conclude in *Institutional Controls at Superfund Sites* that: “local governments can repeal or modify any ordinance that they create. In no other area of American law are there such frequent requests for amendments to the law, and decisions about land use have been among the most controversial and contested issues in many communities. Furthermore, some zoning ordinances place few locational constraints on residential construction, and, especially if a local government does not agree with the proposed Superfund remedy, it may be unwilling to cooperate by amending its zoning ordinance.” (Energy, Environment, and Resources Center, University of Tennessee, July 1997. Hereinafter cited as: *Institutional Controls at Superfund Sites*.) For example, most restraints on local governments ability to change zoning regulations are procedural not substantive.

E. Local governments also face serious problems regarding the long term, permanent application of institutional controls. Enforcement of institutional controls by local government has been called “the weakest link of the chain.” (Claudia Kerbawy, telephone interview with Robert Hersh, November 1995. Kerbawy is Chief of 307, Environmental Response Division, Michigan Department of Environmental Quality, Lansing, Michigan quoted in *Linking Land Use*, p. 65.) E.D. Kelly in *Enforcing Land Use Controls* calls local enforcement and monitoring of institutional controls “a planner’s paradise but an enforcement nightmare.” (Planning Advisory Service, Report Number 409 [Chicago: American Planning Association, 1988], p. 4)

F. The effective use of institutional controls demands coordination between and among several levels of government—a difficult, if not impossible, task. Several government agencies may be charged with selecting and implementing the institutional controls. The lack of coordination and cooperation between these agencies can doom institutional controls to failure. So often in the past, institutional controls have been selected on the federal level and the local government has been charged with implementation. Yet, often the local government does not have the authority, funding, interest in or commitment to the institutional controls imposed on it. Coordination and

commitment problems can mean that the institutional controls will not be implemented as planned and will not be effective. “The entities responsible for implementation and operation of institutional controls must support the controls selected and have the authority, resources and commitment to enforce them. Because institutional controls may be essentially an unfunded mandate and can conflict with other interests of a locality or state, such as economic development, local acceptance is particularly important.” (*Protecting Public Health*, p. 98)

G. The often-poor record keeping of the land use conditions that have been imposed on a Superfund site also compromise enforcement. Even conscientious developers may not be able to ascertain what restrictions have been placed on a piece of property they wish to develop.

H. Problems with local funding also limit the enforcement of institutional controls.

“The long term efficacy of institutional controls must be based on regular monitoring, PRP or site owner compliance, and prompt enforcement; yet funding for environmental monitoring and enforcement at the local level has been reduced, and noncompliance with property-based restrictions can be difficult to detect. With deep funding cuts for environment enforcement activities at both the federal and state levels, there is a strong possibility that noncompliance with institutional controls will go unnoticed. Institutional controls work only if they are complied with. While this is true of any site remedy, institutional controls require monitoring and enforcement over long time periods and are thus more problematic. If we define a right to exist only when there is a system to protect the holder of the right from action or claims of another, to what extent should we see the increased use of institutional controls as a process that reduces the rights of nearby residents or workers on remediated sites while privileging those of past polluters? ” (*Linking Land Use*, p. 68)

I. Local and state governments experience great turnover of staff. Institutional knowledge about the institutional controls is lost when there is a constant turnover of knowledgeable personnel.

Legal Issues Limit the Effectiveness of Institutional Controls

A. Another problem complicating the use of institutional controls is the courts. The courts can potentially play a significant role on land use decisions and land use decisions can be very litigious.

“Although the courts try not to make substantive zoning decisions, judicial attacks on local land use regulations are well documented in case law and in the planning literature and constitute yet another source of uncertainty to the effective working of institutional controls at Superfund sites. In view of the wide variation in the decisions of state and appellate courts concerning the limits of police power to regulate land use and the need for Constitutional protection for the individual, it is easy to envisage the possibility that an owner of a site that is encumbered with a use restriction may challenge and successfully invalidate an institutional control, such as a zoning restriction, on the grounds that the restriction will cause a severe burden and, as such, constitutes a taking of private property by the government.” (*Linking Land Use*, p. 64)

B. The NCP does not clearly specify the legal authority for institutional controls. Because there are no detailed statutory specifications of institutional controls, institutional controls are often left to the end of the remedy selection process where public input is minimal. Leaving them to the end is problematic in that: “If you leave institutional controls to the last and you can’t get them implemented, then you’re stuck. You’re at a dead end rather than the destination of the record of decision (ROD).” (Claudia Kerbawy, *op.cit.*, p. 53)

C. On a practical level, it is unclear who should monitor and enforce the institutional controls. RODs usually have little specificity regarding the implementation and monitoring of institutional controls. Often the specification of the nature and types of institutional controls is very general. Questions abound regarding what kind of monitoring will be performed, who will perform the monitoring, how and what type of enforcement will occur, what will be the frequency of the monitoring, and who is responsible for maintaining the protectiveness of the institutional control arrangements. The technical remedy is determined first and then institutional controls are developed to protect the remedy. Yet, it is often difficult to get acceptance by property owners or PRPs after the ROD is issued

D. Given that issues related to institutional land use/property control are not based in federal law but are based in state property laws or the local police power, federal control of institutional controls on the local level is very limited. CERCLA provides EPA with oversight authority over institutional controls that are part of the ROD remedy but CERCLA provides no mechanisms to enforce that control. Every five years, EPA can amend a remedy when contaminants are left in place, but during that five-year period the supervision of institutional controls is with the local government. Much to compromise a remedy can happen in five years. Moreover, there are serious proposals in Congress to remove the five-year review process. Hence, federal supervision of institutional controls is very problematic and could disappear altogether.

E. It is very problematic whether an institutional control on a current owner of a particular property would bind subsequent owners of that property. “Can third parties (for example, community groups or the local government) enforce a restriction at a site if the property owner fails to comply with the control and the holder of the easement, for example, (EPA, a PRP, the state government, or a local government if signatory to the agreement) fails to act properly? (*Linking Land Use*, p. 57) In *Environmental Regulation of Real Property*, N. Robinson comments that institutional control covenants are very complicated and that “they often defeat the attempts of parties to write covenants which will be enforceable against successors.” (pp. 6-16) For example, the form of future property ownership must be similar to the existing type of property ownership for an institutional control restriction to continue in force. Once a property is sold to a new owner, monitoring of what the new owner does on the property is diffuse if it exists at all.

What happens in a commercial venture if the purchaser of the property goes bankrupt? Who is responsible for the institutional control restrictions on the property? Who will enforce these restrictions? State laws regulating the use property are Byzantine.

“The common law tradition of different types of ownership could limit long-term effectiveness of (institutional controls’) reliability if they fail to bind third parties to the agreements worked out in the consent decree, and

the question of authority—who holds an easement and on what legal basis can the government or some other entity challenge noncompliance with the easement or deed restriction—is, again, open to interpretation. These issues suggest that proprietary controls, negotiated between PRP/site owners and government (federal, state, local) may be insufficient by themselves to effectively ensure the long-term safety of the public from residual contamination. Their reliability hinges on how carefully they are devised, the authority and willingness of the party holding the rights to use them, and the willingness of a property owner to comply.” (*Linking Land Use*, p. 58)

F. Multiple owners or multiple use of a site also compromise the ability of government to police institutional controls.

G. The “touch and concern” doctrine can limit the efficacy of real covenants in the institutional control process. “Equitable servitudes” also are limited in their effectiveness by the “touch and concern” requirement.

H. Liability under institutional controls is problematic.

“When institutional controls are created, it is important to determine who will be liable in the event they fail. Even if the EPA has entered into a consent decree at the time of the initial site remediation releasing PRPs from liability for residual contamination, questions remain about liability if the institutional controls are violated. For example: If the current property owners allow development that violates use restrictions, are they liable, are the original PRPs liable, or both? If people are harmed by such a violation, would they be able to sue the current property owners, the original PRPs or both?” (*Institutional Controls at Superfund Sites*, p. 34)

I. Another difficulty is that land use controls are “vulnerable to changing legal interpretations about the nature of property rights.” (Wernstedt, et. al., *Basing Superfund Cleanups on Future Land Uses: Promising Remedy of Dubious Nostrum?*, Resources for the Future, Discussion Paper 98-03, October 1997, p. 16) For example, if the courts expand the scope of takings decisions to increase the extent to which government regulations are viewed as a “taking” then the efficacy of institutional controls will be diminished.

APPENDIX B

APPENDIX B

PUBLIC COMMENTS SUBMITTED TO AND ANSWERED IN THE 2016 5-YEAR REVIEW

There are 18 emails; each email was assigned a unique letter identifier (“A” through “R”). Individual comments in each email were sequentially numbered (i.e. 1, 2, 3, 4...). For this compilation, each email comment is referred to by a unique alphanumeric code; for example, the 5th comment in email “C” is noted as comment “(C5).” This system of nomenclature allows easy access back to the exact location of the original comment.

Comments were organized by topic as shown in Table 1 below. Email comments associated with a particular topic were paraphrased and sequentially numbered (1 to 32) as shown below. The alphanumeric codes for all email comments [i.e. “(C5)”) were listed below each of the 32 paraphrased comments listed in Table 1.

Typographical errors in the original email comments have not been corrected. For consistency, comments have been compiled using a uniform font, font size, style, and margin settings. Many of the emails contained multiple attachments containing multiple pages of comments; all attached comments are included in this compilation. Many email comments were similar in nature, or were repeated verbatim several times (sometimes even in the same email, or in the attachments to an email). Every comment in every email has been included in the compilation of comments below.

**TABLE 1
TOPICS AND PARAPHRASED COMMENTS**

Topic	Comments (Paraphrased)	Comments Submitted to the ESD
Agency Accountability	1-2	G8, G6, G15, G9
Community Involvement	3-5	G8, G15
Dioxin (and other COCs)	6-13	K4, E5, G1, G8, G12, G13, G16, J5, D1, H2, G9
Cleanup and Cleanup Levels	14-16	G2, G1, G8, G13, G15, G17, G9
Storm Water and Erosion	17	E5, J5, G15, D1, G14, H2, H4, G5, G11
Remedy - Institutional Controls	18	G8, J5, G15, D1, H2, H4, D2, D3, D4, D5, D6, D8, D9, D10, D11, G4, H11, H5, V.1-18
Remedy - Capping	19-20	K4, E5, G8, G13, G16, J5, G15, D1, G3, G14, H2, H4, K3, G17
Five-Year Review	21-24	G6
Reuse of the Site	25	G8, G7
Air Quality	27-29	G9

Agency Accountability

Comments submitted to the ESD [G8, G6, G15, G9]

1. The agencies are not as accountable to the public as they should be. The agencies ignore public comments. There is a lack of transparency in the cleanup process and decision making process. EPA and DEQ do not take existing threats to human health and the environment seriously.
(A1), (D1), (D6), (D14), (D29), (D56), (D61), (D65), (D71), (D72), (F19), (F24), (F25), (J1), (M21), (M26), (M27), (O6), (O11), (O12), (P3), (P4), (R1), (R18)

Department of Environmental Quality (DEQ) Response: This year DEQ finalized a new Community Involvement Plan that specifically addresses concerns regarding transparency in the cleanup and decision-making processes. The public outreach tools found in the Community Involvement Plan will be important as DEQ rolls out the Five-Year Review and the subsequent Explanation of Significant Difference that will propose changes to the Record of Decision. DEQ will also use the public outreach tools to aid with the public comment process for the Explanation of Significant Difference. Finally, the public outreach tools will be used to communicate different aspects of the final off-load construction design, which includes consolidating all waste under an engineered cap, and run-on and run-off storm water management, , and ongoing consideration of land use and related institutional controls.

2. The Five-Year Review is biased because (1) DEQ selects the people who will be interviewed, (2) the agencies conduct its own assessment without third-party or independent oversight, and public notice or misleading, and (3) public involvement in the Five Year Review process has been minimal. Aspects of the process appear clandestine completed in secrecy.
(A7), (B10), (B13), (C1), (C3), (C6), (D13,) (D14), (D61), (E10) (J2), (J3), (O5), (P2), (R16), (R18), (R21)

DEQ Response:

(1) DEQ initiated the interview process for the fourth five-year review by selecting what it believed to be a representative cross-section from the Butte community. After further input, DEQ advertised that it would conduct additional interviews to anyone who wished to participate. The notice, which included solicitation for interviews, appeared in the Montana Standard on February 29, 2016, March 1, 2016, March 6, 2016, April 14, 2016, and April 17, 2016.

(2) Per the Environmental Protection Agency's (EPA) Office of Superfund Remediation and Technology Innovation, independence in a five-year review is achieved through the varying levels of review required by individuals who have no connection to the site in question, even though they are employed by the Agencies. The "Comprehensive Five-Year Review Guidance" (OSWER 9355.7-03B-P, June 2000) indicates that the project manager is part of the review team conducting a five-year review at any site. While the agencies can use contracted services or other agencies to provide assistance in conducting five-year reviews, EPA and/or DEQ are ultimately responsible for making the determination whether the remedy is protective as required by the CERCLA law. The participation of the project manager in the five-year review is standard practice.

(3) DEQ is working to increase public involvement overall for the Montana Pole and Treating Plant (Montana Pole) site and specifically with regard to the Five-Year Review process. DEQ just completed a new Community Involvement Plan for MPTP. The planned rollout of the Five-Year Review will include a summary that is tailored towards the general public; an article in the Montana Standard as well as announcements of the release of the Fourth Five-Year Review;

presentations to Citizens Technical Environmental Committee (CTEC), Butte-Silver Bow (BSB) Council of Commissioners, and other public meetings; plus other outreach strategies.

Community Involvement

Comments submitted to the ESD [G8, G15]

3. Community involvement for the Five-Year Review process and for the project in general, has been inadequate and ineffective; nor does it follow relevant guidance. What steps will be taken in the future to include the public in the decision-making process?

(A2), (A7), (B1), (B10), (B13), (C1), (C2), (C5), (C6), (C7), (D1), (D3), (D6), (D14), (D29), (D72), (E11), (J2), (M39), (O12), (O19), (P1), (P2), (P3), (P4), (P6), (Q8), (R2), (R12), (R18), (R21)

DEQ Response: No community involvement activities during the five-year review are mandated in CERCLA or addressed in the National Contingency Plan. However, at a minimum, the Comprehensive Five-Year Review Guidance recommends the following:

- *Inform the community and other potentially interested parties that a five-year review will be conducted, using the most appropriate communication method or activity for the specific community.*
- *Inform the community and other potentially interested parties that a five-year review was conducted at the site.*
- *Prepare a brief summary of the results, inform the community that the five-year review report is complete and available for review, post the report on a site webpage, and make the report and the summary available to the public in the information repository.*

A public notice was published in the Montana Standard notifying the public that the Five-Year Review was being conducted and provided contact information for DEQ and EPA should anyone wish to provide comments. The notice was published on February 29, 2016, March 1, 2016, March 6, 2016, April 14, 2016, and April 17, 2016. An open house was held on April 27, 2016, at the fire station in the Boulevard neighborhood adjacent to the site.

Nearby residents, local officials and other interested parties were interviewed in order to document any perceived problems or successes with the remedy that has been implemented to date. The Five-Year Review includes interview summary forms and key themes or items identified.

The planned community outreach for the release of the Five-Year Review includes a summary of the results, public service announcements and other notifications that the report is complete, and posting the report online and making it available in the information repository.

Additionally, the Montana Pole Community Involvement Plan was updated in 2016. Interviews were held with community members and local officials to determine the best methods of communication for the site. DEQ takes these comments seriously and is dedicated to working closely with the community and providing timely and accurate information to the public.

4. Newspaper announcements should better define the scope of public meetings and public review periods; outreach also needs to be directed toward neighborhoods.
(A2-A6), (B12), (D60), (J2), (P2), (P5), (R3), (R17)

MDEQ Response: Notices were published in the Montana Standard (see question #3 for specific dates). One provided notification that a Five-Year Review was to be conducted, per the Comprehensive Five-Year Review Guidance. After receiving feedback, DEQ published a second notice specifically inviting people in the area to provide information they may have about the site, including some examples of things DEQ was interested in knowing about. Examples provided included:

- *Ways the cleanup at the site has helped or hurt the neighborhood;*
- *Broken fences, unusual odors, dead plants, materials leaving the site or other problems;*
- *Buildings or land around the site being used in new ways;*
- *Any unusual activity at the site such as dumping, vandalism or trespassing.*

A notice was also placed regarding the open house which was held during the public input period for the five year review. It included the date, time, location, and format, with contacts for additional information.

A newsletter was also sent to all contacts listed in the DEQ MPTP hard copy and email mailing lists, including everyone in the surrounding Boulevard and Williamsburg neighborhoods. The newsletter provided notification that the open house was to be conducted. The Montana Standard wrote an article that mentioned the open house.

After updating the Community Involvement Plan update, DEQ recognizes that there are other ways that the community could have been informed of the Five-Year Review and open house. Some future avenues of notification could include and are not limited to:

- *Utilizing BSB's social media;*
- *Press releases;*
- *Email notifications and reminders separate from newsletters.*

5. Meetings are generally a one-way flow of information that attempts to “sell the cleanup” rather than solicit input from the public. The public is excluded from meaningful involvement and two-way communication at public meetings.
(A1), (A2), (B2), (B13), (D60), (J2), (R21)

DEQ Response: In regards to the 4th Five Year Review, DEQ held an open house on April 27, 2016. The open house included information stations staffed by experts working on the cleanup that allowed for people to talk about and obtain information on various aspects of the site. A short presentation was held in the middle of the open house to provide additional information for people that preferred that format. People were encouraged to talk directly with staff about their concerns and to ask questions. This format allowed members of the public to be able to ask their questions to the most qualified staff members.

Over time, DEQ has also met informally with members of the surrounding neighborhoods to discuss the Montana Pole site, as well as provided information and updates at the CTEC meetings.

In the future and based on feedback for the Community Involvement Plan, DEQ will take into consideration different venues and formats for conducting meetings and the potential for holding multiple meetings at different times to allow for a greater number of people to attend.

Dioxin (and other COCs)

Comments submitted to the ESD [K4, E5, G1, G8, G12, G13, G16, J5, D1, H2, G9]

6. Dioxin cleanup levels for soil, groundwater, and plant discharge water at the Montana Pole and Treating Plant (MPTP) site are not being met and will not be met in the near future, presenting a continuing threat to human health and the environment.
(B3), (B4), (B6), (B7), (C2), (D16), (D18), (D32), (D37), (D39), (D41), (D51), (D56), (E2), (F16), (F17), (F20), (J6), (M10), (M11), (M18), (R6)

DEQ Response: With respect to soil, DEQ agrees that the cleanup level for dioxin is not being met by the biological treatment at the land treatment unit. This issue is identified in this Fourth Five-Year Review, which states:

“Leaving soils with dioxins above Record of Decision soil cleanup standards may be appropriate when implemented with appropriate engineering controls (e.g., soil cover designed in compliance with Applicable or Relevant and Appropriate Requirements, as well as appropriate storm water management) and institutional controls. However, this was not a remedy identified in the Record of Decision. A decision document is needed to sufficiently address placement of soils on-Site with dioxin concentrations above the Record of Decision standard; the decision document should occur prior to the final design and implementation of the offload and cover.”

The Five-Year Review recommends that a decision document be prepared to address placing treated soil on-site that contains dioxins above cleanup levels, before final design and implementation of the remaining land treatment unit offload and placement of cover. The decision document will address protectiveness and other requirements of the Superfund law with respect to soil left on-Site with dioxin concentrations above cleanup levels, such as requirements for capping, storm water management, and any other pertinent engineering and institutional controls.

With respect to groundwater and plant discharge water, the Fourth Five-Year Review discusses in detail that there is a need to update cleanup levels for dioxin. For groundwater, the Record of Decision cleanup level of 30 picograms/liter (pg/L) is higher than the current DEQ-7 standard of 2 pg/L. For plant discharge water, the Record of Decision standard of 10 pg/L is higher than the current DEQ-7 standard in surface water of 0.005 pg/L. However, the Five-Year Review also explains that this issue is complicated because the average dioxin TEQ for laboratory method blanks (laboratory-grade distilled water using clean, laboratory-grade glassware) from 2009 to 2015 using the DEQ-7 methodology (2.04 pg/L) is greater than DEQ-7 dioxin standard for groundwater or surface water. An assessment of observed concentrations in groundwater or plant discharge water to cleanup levels is not meaningful until these cleanup levels for dioxin are clarified, especially the surface water cleanup level. Therefore, the Fourth Five-Year Review identifies updating cleanup levels (including dioxin in groundwater and plant discharge water) as an issue and recommends these cleanup levels be clarified in a decision document.

Despite these issues, the following observations are pertinent:

- With respect to groundwater, there is no evidence of a mobile groundwater plume of dioxin. As stated in the Fourth Five-Year Review, “there are no obvious trends in [dioxin]*

concentration over time at any particular well location, and there is no discrete 'dioxin plume' or plume boundary that can be inferred from the data." This statement is true regardless of whether the groundwater cleanup level is 30 pg/L or 2 pg/L. The Five-Year Review further states: "The conceptual model of the Site is that dioxin is not mobile in groundwater. It is possible that some dioxins are adhered to very fine particles and thus may at times be detected in liquid matrix samples that exhibit relatively high turbidity, and it is also possible that some dioxins are introduced to the trenches in sheens of oils, though in recent years observations of sheens have been limited to just a few instances at the near-highway recovery trench and are not commonplace." If dioxin were mobile in groundwater, there would be consistent detections in numerous monitoring wells, as is the case with pentachlorophenol, but consistent dioxin detections are not observed for dioxin in groundwater.

- With respect to plant discharge water, the Fourth Five-Year Review indicates that "the dioxin Toxic Equivalents effluent concentration in the last five years has been below 1 pg/L (using Record of Decision methodology), well below the Record of Decision discharge limit of 10 pg/L." If these same dioxin concentrations in plant discharge had been calculated using the DEQ-7 methodology, the dioxin Toxic Equivalents values would have been as follows: 2010 - 2.9 pg/L; 2011 - 4.7 pg/L; 2012 - 1.4 pg/L; 2013 - 1.2 pg/L; 2014 - 2.0 pg/L; 2015 - 1.7 pg/L; 2016 - 1.0 pg/L. These values have a minimum of 1.0 pg/L, a maximum of 4.7 pg/L, and an average of 2.1 pg/L. These statistics are almost identical to the dioxin Toxic Equivalents statistics calculated for laboratory method blanks (as discussed in Attachment 5 of the Fourth Five-Year Review), which yielded a minimum dioxin Toxic Equivalents of 0.7 pg/L, a maximum of 4.5 pg/L, and an average of 2.0 pg/L. In other words, using the DEQ methodology, the plant discharge water has similar dioxin Toxic Equivalents values as the laboratory method blanks (distilled water). Comparison of plant discharge to a DEQ-7 standard of 0.005 pg/L is not meaningful if the average value from laboratory blanks using the DEQ-7 methodology is approximately 2 pg/L. Furthermore, the surface water sampling in Silver Bow Creek (upstream of, adjacent to, and downstream for the MPTP Site) does not indicate any degradation of surface water quality caused by dioxin from plant discharge water. The Fourth Five-Year Review states the following with respect to surface water sample in the last 5 years: "The highest dioxin Toxic Equivalents level [in Silver Bow Creek] was at upstream location SW-09 in 2013, when the concentration was 1.86 pg/L. That location is upstream from the Site and suggests the higher concentration at that location is not related to the dioxins associated with MPTP. All other dioxin Toxic Equivalents values at these surface water sampling locations in the last five years were less than 0.5 pg/L, and typically less 0.1 pg/L." Again, all of these values are below the average value detected from laboratory method blanks from 2009 to 2015 (2.04 pg/L).
- With respect to soil and groundwater, institutional controls, including the Site fence and the Controlled Groundwater Area, prevent people from contacting and being exposed to contaminated soils and groundwater, and these institutional controls will be maintained (see response to Comment #7).

Based on the items discussed above, DEQ and EPA do not agree that the levels of dioxin in soil,

groundwater, and plant discharge present a continuing threat to human health and the environment as long as adequate engineering and institutional controls are implemented and maintained. These issues will be addressed for the long-term in the forthcoming decision document and associated design.

7. Dioxin is a highly toxic and deadly carcinogen for which there are no safe exposure levels. Other Site contaminants (furans, PCPs and PAHs) also pose serious risks.

(D8), (D17), (D26), (D50), (D67), (E2), (F8), (F15), (F21), (G2), (I4), (I9), (I12), (I13), (J7), (K2), (M8), (M22), (M37), (O6), (O7), (O24), (R4)

DEQ Response: Cleanup levels for dioxin and other Site contaminants were established in the Record of Decision, some of which will be updated in a forthcoming decision document per the Fourth Five-Year Review. These cleanup levels consider risks based on potential exposure to specific concentrations of contaminants. As part of the remedy, risks to receptors from contaminants can also be addressed with engineering and institutional controls that prevent exposure to contaminants that exceed the cleanup levels. The Fourth Five-Year Review concludes in the Protectiveness Statement that “The remedy for Operational Unit-1 (the only operational unit for this Site) currently protects human health and the environment because exposure pathways that could result in unacceptable risk are being controlled by soil containment, hydraulic capture of impacted groundwater, access controls, and a Controlled Groundwater Area (an institutional control).” The Five-Year Review also recommends certain additional actions to ensure protectiveness is maintained for the long term. Specifically, the Five-Year Review recommends the following for the remedy to remain protective in the long-term:

- “Prepare a decision document, prior to final design and implementation of the remaining land treatment unit offload and placement of cover, to document and/or incorporate the following: 1) Placing treated soil on-Site that contains dioxins above cleanup levels; 2) Updating Record of Decision cleanup or discharge standards; 3) Identifying objectives and performance standards for cover [on treated soils] and [the associated] ICs; 4) Finalizing points of compliance for surface water and groundwater; and 5) Clarifying other remedy items as needed or appropriate (e.g., potentially remaining sources of pentachlorophenol beneath the Interstate or elsewhere on the Site).*
- “Develop and implement permanent institutional controls including deed restrictions and/or environmental covenants for all appropriate areas to prevent future on-Site residential use, and restrict land use where waste is left in place above levels that allow for unlimited use/unrestricted exposure. The institutional controls should also address protection of remedy components such as the [Corrective Action Management Unit] facility that is planned [for the on-Site management of treated soils impacted by dioxin]. These efforts are currently in progress.”*

8. Dioxin will remain in soils and dioxin cleanup levels for soil are not being met; dioxin will continue to contaminate Silver Bow Creek.

(B3), (D8), (D18), (D42), (D62), (D63), (E2), (F2), (F9), (G1), (I5), (I6), (I11), (M9), (M10), (M17), (M24)

DEQ Response: See response to comment #6.

9. The current dioxin discharge from the MPTP Site into Silver Bow Creek does not meet water quality standards; discharge is 100 times the water quality standard.

(B4), (B6), (D19), (D21), (D28), (D56), (D57), (D69), (F16), (F17), (F23), (M17), (M18), (M24), (O9), (O32), (O33), (R7), (R9)

DEQ Response: See response to comment #6.

10. Treatment of dioxin-contaminated soil using white rot fungi, or an alternate proven active biological treatment technology should be considered (instead of encapsulation of waste in place). (D36), (D45), (F4), (J8), (M3), (M34), (O20), (O21)

DEQ Response: White-rot fungus has been used to remediate organic soil contaminants, including dioxins. A major limitation of the fungal remediation is the sensitivity to biological process operations; white-rot fungus does not grow below 50 °F, and no significant growth rate occurs between 86 ° and 102 °F (<http://www.hawaii.edu/abrp/Technologies/fungus.html>). The temperature limitations are problematic for on-site application in Butte; when combined with the lack of published pilot-scale or full-scale application of white-rot fungi remediation of dioxins to the Site Record of Decision standard, this technology is not considered to be applicable to the Site. The EPA website Clu-In (<https://clu-in.org/techfocus/default.focus/sec/Bioremediation/cat/Overview/>) identifies that the structure of dioxins is resistant to chemical or biological degradation; many of the accepted dioxin remedial techniques rely on thermal destruction. The Record of Decision soil remedy of excavation and ex situ biological treatment was selected, in part, based on the Butte public opposition to incineration.

Comment D45 states "... an article entitled: 'Treatment of Dioxin Contaminated Soils,' Standberg, et al., published in November 2011 by the Swedish Environmental Research Institute provides compelling evidence of the efficacy of active biological treatment on wastes similar to those found at the Montana Pole and in a climate similar to Butte's climate." However, the cited article presents information only for biological treatment to remediate polycyclic aromatic hydrocarbons; there is no discussion regarding biological treatment of dioxins.

11. Does the Butte Alluvial and Bedrock Controlled Ground Water Area (BABCGWA) adequately protect the public and environment from drinking PCP- or dioxin-contaminated water? (D40)

DEQ Response: The Butte Alluvial and Bedrock Controlled Ground Water Area (Controlled Groundwater Area) was established on October 30, 2009, by the Montana Department of Natural Resources and Conservation in accordance with §§ 85-2-506 & 507, Montana Code Annotated, in response to a petition submitted by the BSB County Health Department. The Controlled Groundwater Area prohibits new groundwater wells in the alluvial and bedrock aquifers without review and approval by the BSB Board of Health, EPA, and DEQ. Any owner proposing a new or replacement water well for limited irrigation or industrial use within the Controlled Groundwater Area must supply data to the BSB Water Quality District indicating that the uses will not be detrimental to the environment or to human health. There are no known water wells used for human consumption that are impacted by MPTP contaminants, and the Controlled Ground Area effectively prohibits the development of new domestic use wells, at least until safe levels of contamination are achieved in the MPTP groundwater. The Controlled Groundwater Area includes all impacted areas of the Montana Pole facility, but the boundaries of the Controlled Groundwater Area may be amended if degradation of groundwater expands, based on continued monitoring. DEQ believes that the Controlled Groundwater Area adequately

protects the public from consumption of groundwater containing pentachlorophenol or dioxin above current established human health levels.

12. Dioxin is mobile in soil and groundwater. If dioxin isn't mobile, how did dioxin get into the recovery trenches? If it is not mobile, why is it present in groundwater? What are background levels of dioxin in groundwater at other urban areas? What is the long-term fate of dioxin in groundwater at the MPTP Site?

(D39), (D41), (D46), (D47), (D48), (D49), (F5), (F6), (F7), (M4), (M6), (M7), (M32), (M33), (O22), (O23)

DEQ Response: As discussed in the response to Comment #6, the conceptual model of the Site is that dioxin is not mobile in groundwater. It is possible that some dioxins are adhered to solids that are present in liquid matrix samples that exhibit relatively high turbidity (i.e. solids with strongly sorbed dioxin are not mobile but can enter the monitoring well during sampling), and it is also possible that some dioxins are introduced to the trenches in sheens of oils. However, in recent years observations of sheens have been limited to just a few instances at the near-highway recovery trench and are not commonplace. The literature also suggests potential for dioxin transport via transport of colloids (one substance dispersed through another substance). However, if dioxin were mobile in groundwater, there would be consistent detections in numerous monitoring wells, as is the case with pentachlorophenol, but consistent dioxin detections are not observed for dioxin in groundwater. Dioxin sampling in groundwater has been limited relative to pentachlorophenol sampling, but a good example is provided by wells 10-01 and 10-02, located near Silver Bow Creek (see Table 3 in Attachment 5 of the Fourth Five-Year Review for concentration data). Pentachlorophenol concentrations in those wells are between 10 and 20 times the pentachlorophenol standard, but do not appear to be affected by dioxin because the dioxin concentrations are similar to those found in laboratory method blanks. These data points, coupled with the lack of dioxin impacts in surface water (see response to Comment #6), support the conceptual model that dioxin is not mobile in groundwater.

Dioxins are no longer produced or used commercially in the United States; dioxins are formed in the production of some chlorinated organic compounds. Additionally, dioxins are produced during combustion processes, including waste incineration (commercial, municipal, and backyard), burning fuels, and forest fires. DEQ has not identified federal or state government databases with background dioxin groundwater concentrations; therefore "a comparison of dioxin levels in groundwater at Montana Pole with background levels of dioxin in groundwater at other urban areas" is not possible.

Comment D46 states that page 14 of the Record of Decision "says that it is possible for dioxin in soils to migrate." This statement is not correct; instead, the Record of Decision states "The [dioxin] compounds adhere tightly to soil particles and do not migrate readily or leach into groundwater or surface water unless the contaminated soil particles themselves migrate via erosion processes (Freeman, 1989)" (p. 8).

Even though some solids with sorbed dioxin (below the water table) adjacent to monitoring well screens may be contained in samples along with groundwater, this sorbed dioxin is not mobile over any significant distance. While colloidal transport is conceptually possible, there is no current evidence of a discrete or mobile dioxin plume. Dioxin transport in oils is believed to be the most likely mechanism for dioxin impacts in the extraction trenches. The Fourth Five-Year Review notes that "within the last two years there have been several observations of minor oil sheens in the near-highway recovery trench." However, the Five-Year Review also notes that "when

coupled with the observation that floating product (free oil) was not detected in any monitoring well during any sampling conducted in calendar years 2010 through 2015, these observations suggest that significant ongoing transport of free-phase light oil is not a major concern at Montana Pole...” Similarly, it is anticipated that dioxins in land treatment unit soils (to be offloaded) would not be mobile because carrier oils are no longer present in this material. Thus, the long-term fate of dioxin in groundwater at the Montana Pole Site is to remain in the subsurface, adhered strongly to soil particles (including below the water table) for a very long period of time. As remaining oils continue to bioremediate, the minor transport of dioxin via oils (such as to the recovery trenches) will diminish over time and any remaining dioxin from those oils will sorb to the soil matrix.

13. DEQ acknowledges that dioxin can be mobile in soils at the White Pine Sash Site, so why would dioxin not be mobile at the MPTP Site? There was gross misuse of comparisons at the public meeting where this was discussed.
(D49), (D53), (F7), (F12), (M7), (M12), (O23), (O28)

DEQ Response: The Record of Decision for the White Pine Sash site does not discuss in detail the mobility of dioxin in soil or groundwater, but notes that dioxin is a recalcitrant constituent that is difficult to treat, and that the selected active remedies for soil and groundwater at that site may not achieve cleanup standards for dioxin. The Record of Decision for that site further indicates that subsequent monitoring will be used to assess long-term attenuation of dioxin that remains after active remediation efforts (i.e. attenuation through naturally occurring processes), in conjunction with institutional controls. A similar approach is likely to apply to the Montana Pole Site (to be determined in the forthcoming decision document).

Cleanup and Cleanup Levels

Comments submitted to the ESD [G2, G1, G8, G13, G15, G17, G9]

14. Some ROD cleanup levels are less protective than national or DEQ-7 standards for certain COCs; meeting these lax ROD cleanup levels does not protect human health or the environment. The Five Year Review does not explain how the need to meet current DEQ-7 standards was evaluated, or the rationale for not adopting the current national or DEQ-7 standards. The original remedy may need to be revisited to address the more protective standards.
(B5), (B6), (B7), (C9), (D20), (D23), (D38), (D39), (D52), (E7), (E8), (F11), (J5), (J12), (M11), (M36), (M39), (O16), (O19), (O27), (R8)

DEQ Response: As part of the fourth Five-Year Review, cleanup levels were evaluated against DEQ-7 standards and EPA preliminary remediation goals, as well as undergoing new risk evaluation based on the most current toxicity data and risk assessment guidance. All proposed changes to cleanup levels will be presented in the decision document. The proposed cleanup levels, combined with post-treatment dioxin concentrations which will not reach the dioxin cleanup goal, will require changes to the original remedy, which will be detailed in the decision document.

15. The overall cleanup at the Site is ineffective; the Site is not safe; DEQ clings to a failed remedy; cleanup standards are not being met; contaminants are being released; and the remedies being considered are not protective. How can DEQ honestly claim that the Site is remediated and not pose a threat to human health or the environment? As currently being implemented, the remedy fails to

provide a permanent, comprehensive cleanup that reduces the toxicity and mobility of contaminants.

(B9), (C2), (C9), (D4), (D5), (D6), (D7), (D8), (D9), (D16), (D18), (D23), (D25), (D28), (D41), (D52), (D56), (D60), (D62), (D66), (D70), (D74), (E1), (E2), (E6), (E13), (F1), (F9), (F16), (F23), (F26), (H1), (I1), (I2), (I7), (J4), (M9), (M10), (M11), (M28), (O1), (O9), (O14), (O26), (O32), (O33), (P2), (R8), (R11), (R15), (R19)

DEQ Response: DEQ and EPA disagree with these statements and questions for the following reasons. The cleanup of Montana Pole, as mandated by the Record of Decision, is not complete. As the various phases of the cleanup are implemented, engineering controls (e.g., fencing, earthen caps) and institutional controls are used to protect human health and mitigate exposure to on-site contaminants until the cleanup is completed. The final off-load design and construction, including a permanent cap, will complete the cleanup for the southern portion (all property south of the interstate) of the Montana Pole site.

Groundwater cleanup is a long, slow process and the water treatment at Montana Pole is no different. The water treatment plant is undergoing further evaluation in an effort to enhance the effectiveness and streamline the cost of the water treatment process. Regardless, water treatment is expected to continue for at least another 50 years. Nevertheless, the discharge of treated groundwater to surface water is protective of human health.

The northern portion (all property north of the interstate) of the Montana Pole site will also undergo additional investigation, design, and construction to complete the non-groundwater remediation for the northern property. In the meantime, the engineering controls will serve to protect against human exposure to on-site contaminants.

16. There is concern that DEQ has decided not to adhere to the cleanup standards in the ROD for the MPTP Site, and will waive them.

(B7), (D22), (E5), (R10)

DEQ Response: The Montana Pole cleanup will follow the cleanup standards put forth in the Record of Decision and as revised in the forthcoming decision document. Cleanup standards will either remain as they are in the Record of Decision or be revised in the decision document to a lower concentration.

Storm Water and Erosion

Comments submitted to the ESD [E5, J5, G15, D1, G14, H2, H4, G5, G11]

17. The threats to the Site remedy from storm water and erosion need to be better addressed. How will storm water be controlled? How will soil erosion be controlled? Long-term storm water runoff and soil erosion plans are needed.

(B8), (C2), (D12), (D41), (D43), (D46), (D54), (D59), (D62), (D63), (E9), (F2), (F6), (F13), (G1), (G2), (H1), (I6), (I11), (I14), (J9), (J10), (K2), (M13), (M14), (M29), (O2), (O3), (O22), (O29), (Q5), (R13), (R14)

DEQ Response: DEQ and EPA agree with this comment. The Fourth Five-Year Review notes the following: "Phase 6 [of the remedy] is currently in the planning state, and will consist of removal and disposal of the soil treatment facilities on the south side of the Site, final engineering controls (soil cover, storm water management), re-vegetation of all disturbed areas, and implementation of appropriate institutional controls to maintain protectiveness of the remedy.

In conjunction with these efforts, modeling was performed to estimate the floodplains at the Site...the previous land treatment unit offloads were not placed within the illustrated floodplain. Design of the final land treatment unit offload will need to consider the modeled floodplain locations and potential storm water management approaches to ensure the soils with dioxins are not within areas where flooding is expected. An update to storm water management planning and documentation is currently underway, and needs to consider locations of soils containing dioxins above Record of Decision cleanup standards (previous and planned).” Note that the Fourth Five-Year Review presumes a soil cover for treated soils, but the forthcoming decision document and associated design documents could incorporate a synthetic cover.

The Five-Year Review also notes that the treatment plant operator stated that storm water does not flow off the Site, even during large storms such as occurred in 2011.

It is anticipated that storm water management plan will be developed to manage storm water during construction of the soil cover. Post-construction erosion controls will be designed to reduce sheet flow velocity and flow concentration which will prevent erosion of the cover. The controls will be used until the vegetation or other surface features are established. Final Site grading will be designed to provide erosion control; as an example, slopes will be kept at a minimum. Storm water originating on-Site will be retained on-Site and will evaporate or infiltrate to groundwater that is collected and treated in the water treatment plant.

Storm water originating off site or originating on-Site and not in contact with the cover over the contaminated soil will collect only in areas that have not been filled with treated soils from the LTU that contain dioxins (and in areas that are otherwise not suspected to contain soil that could result in impacts to groundwater). This will eliminate the potential for groundwater contamination beneath the ponded areas.

It is also anticipated that the soil cover will be stabilized with native vegetation, which is unlikely to result in mobilization of dioxins. There are limited data on plant uptake of dioxins, but the majority of plants evaluated have shown the uptake from soil and translocation into edible parts of the plant to be very low, with the main pathway for contaminants into the plant being atmospheric deposition. Data on uptake of dioxins from soil have been identified for green vegetables, root vegetables, and tuber vegetables. The vegetation used to stabilize the soil covers will not include vegetables.

The forthcoming decision document will address protectiveness with respect to soil left on-Site with dioxin concentrations above cleanup levels, such as requirements for capping, storm water management, and any other pertinent engineering and institutional controls. Appropriate monitoring and maintenance actions, public access control, and other institutional controls will be needed to ensure that the integrity of the final cover and the site storm water conveyance system is not disturbed.

Remedy - Institutional Controls

Comments submitted to the ESD [G8, J5, G15, D1, H2, H4, D2, D3, D4, D5, D6, D8, D9, D10, D11, G4, H11, H5, V.1-18]

18. Institutional controls have not be adequately formulated for the site; also, there are documented significant issues associated with the use of institutional controls at hazardous waste sites. [see comments (D64), (G3), (K3), (L1), and (N2) for very detailed lists of concerns regarding use of ICs.]

There are legal issues associated with the use of institutional controls [see comment (K4) for details]. How do use of institutional controls relate to site redevelopment? (C2), (C6), (D11), (D27), (D32), (D33), (D36), (D56), (D64), (D68), (E4), (F15), (F22), (G2), (G3), (H2), (I16), (J11), (K1), (K2), (K3), (K4), (L1), (M16), (M23), (M38), (N1), (N2), (O4), (O8), (O18), (O31), (Q6), (Q7)

DEQ Response: Institutional controls are generally established at the close of remedial action to ensure that they are appropriate to protect the remedy as implemented. Some institutional controls, such as deed restrictions on property owned by the Atlantic Richfield Company and the Controlled Groundwater Area, are already in place. As part of the remedial design process for the Montana Pole land treatment unit offload and closure, an Institutional Controls Implementation and Assurance Plan will be developed to describe the controls that will be necessary to protect the final remedy at the Site. By developing additional institutional controls as part of the closure design process, DEQ and EPA will be able to complete detailed discussions with BSB and other parties responsible for implementing, maintaining, and enforcing institutional controls. Other relevant stakeholders will be included in this process as appropriate.

Additional permanent institutional controls to be developed and implemented include deed restrictions and/or environmental covenants for all appropriate areas to prevent future on-Site residential use, and restrict land use where waste is left in place above levels that allow for unlimited use/unrestricted exposure. The institutional controls should also address protection of remedy components such as the Corrective Action Management Unit facility that is proposed for the on-Site management of treated soils impacted by dioxin. These efforts are currently in progress.

The institutional controls to be developed and implemented will take into consideration the current and future use of the Montana Pole property, and stakeholders as well as land owners will be included in this effort. At Montana Pole, it is anticipated that once the remedy is complete, the property will be transferred to BSB; therefore, BSB representatives will be heavily involved in and consulted during the development of institutional controls.

Remedy – Capping

Comments submitted to the ESD [K4, E5, G8, G13, G16, J5, G15, D1, G3, G14, H2, H4, K3, G17]

19. The proposed minimalist/shallow soil cap is not protective; and in addition, there are many documented problems with the use of caps. [see comments (D63), (G2), and (K2) for very detailed lists of concerns regarding capping.] There are long-term maintenance issues and leaching through caps can occur; thus, it is questionable whether a cap can protect human health and the environment. Containment is also contrary to the Superfund mandate that treatment is to be preferred over leaving waste in place. The ROD calls for active treatment as the primary cleanup method, not containment (capping). The ROD should be amended to address treatment (or removal) of contaminated soils rather than containment; biological treatment of site contaminants has been shown to work.
(C2), (D10), (D27), (D30), (D34), (D41), (D44), (D46), (D47), (D54), (D56), (D59), (D62), (D63), (D68), (E3), (F4), (F13), (F15), (G2), (I5), (I7), (I8), (I10), (I14), (I15), (J9), (K1), (K2), (M2), (M5), (M13), (M31), (O2), (O7), (Q4), (R14)

DEQ Response: The remedy at the Montana Pole Site has included extensive active remediation, including excavation, biological treatment of soil at the land treatment unit, and the ongoing

groundwater extraction and treatment. Active remediation has been, and continues to be, the primary cleanup method employed at the Site.

Excavation and treatment of soils over large parts of the site was effective at remediating pentachlorophenol and polycyclic aromatic hydrocarbons contamination in soils. Treatment was not fully effective at remediating dioxin contamination. Incinerating soils was one option evaluated prior to the Record of Decision during the early 1990s that could have remediated dioxin. However, "land farming" treatment was selected over incineration partly in response to public opposition to incineration. Dioxin remains in treated soils at the site, and although the dioxin will eventually break down, that will take a considerable amount of time. It is anticipated that the forthcoming decision document will include placement of treated soils on-Site with appropriate engineering controls (such as capping and storm water management) and institutional controls, so that the dioxin is not released at concentrations which would present a hazard to people or the environment.

The Superfund Remedy Report, Fourteenth Edition (EPA 542-R-13-016, November 2013), states "Treatment, on-Site containment, and off-Site disposal of contaminated source media and groundwater were selected at nearly the same rate [for FY 2009 to 2011] as in the previous timeframe evaluated (FY 2005 to 2008). Overall, remedies include a mix of approaches, primarily treatment; on-Site containment; off-Site disposal; monitored natural attenuation (MNA) or recovery (MNR); and institutional controls (ICs)." The remedy at the Montana Pole Site includes a mix of active remediation and containment, plus engineering and institutional controls, consistent with most Superfund site remedies.

Comment F4 states "... an article entitled: "Treatment of Dioxin Contaminated Soils," Standberg, et al., published in November 2011 by the Swedish Environmental Research Institute provides compelling evidence of the efficacy of active biological treatment on wastes similar to those found at the Pole Plant and in a climate similar to Butte's climate." However, the cited article presents information only for biological treatment to remediate polycyclic aromatic hydrocarbons; there is no discussion regarding biological treatment of dioxins. As noted in Response #10, the EPA website Clu-In identifies that the structure of dioxins resists chemical or biological degradation.

20. The Record of Decision for MPTP promised that the dioxins, furans, PCPs and PAHs found at the site would be biologically treated and the site cleaned up. Biological treatment does work. Contrary to the promise of cleanup, the DEQ and EPA have reneged on this promise. MDEQ and EPA have abandoned treatment in favor of containment, leaving the threat in place. (D27), (D41), (D44), (D45), (D47), (D56), (D68), (F3), (F4), (F6), (F15), (F22), (M2), (M3), (M6), (M15), (M23), (M33), (O7), (O8), (O20), (O21), (O22), (O31)

DEQ Response: See Response to Comment #19. Biological treatment has successfully remediated Site soils for pentachlorophenol and polycyclic aromatic hydrocarbons; however, biological treatment has not achieved the Record of Decision cleanup level for dioxin in soils. The Record of Decision selected remedy "uses treatment technologies and permanent solutions to the maximum extent practicable and will be cost effective" (Record of Decision p.38). As noted in the response to Comment #6, the Fourth Five-Year Review recommends that a decision document be prepared to address placing treated soil on-Site that contains dioxins above cleanup levels, before final design and implementation of the remaining land treatment unit offload and placement of cover. The decision document will address protectiveness with respect to soil left on

site with dioxin concentrations above cleanup levels, such as requirements for capping, storm water management, and any other pertinent engineering and institutional controls.

Five Year Review

Comments submitted to the ESD [G6]

21. The Five Year Review needs to be more than a perfunctory process, the DEQ evaluated its own work in the process, and the process does not conform to EPA's Five Year Review Policies. There is mischaracterization of the purpose and scope of a Five Year Review. The public needs to be more involved in the Five Year Review process.

(C1), (C3), (C6), (C8), (C9), (E1), (E12), (J1), (J12), (R20)

DEQ Response: Standard practice in the Superfund program is for the EPA project manager for site remediation to conduct the Five-Year Review. Under the National Contingency Plan regulations, the lead agency (DEQ at this site) is required to conduct the Five-Year Review (Title 40 Code of Federal Regulations [CFR] § 300.430). This Five-Year Review was prepared by DEQ (with contractor assistance) in coordination with EPA Region 8. The Five-Year Review was also reviewed by the EPA Region 8 Branch Chief and EPA headquarters. Additionally, CERCLA law itself identifies the implementing agency as the entity which conducts five year reviews.

The project manager does not act in a vacuum when he or she conducts such a review; these additional reviews by individuals who have no routine connection to the Site provide for independent review. The "Comprehensive Five-Year Review Guidance" (OSWER 9355.7-03B-P, June 2000) indicates that the project manager is part of the review team conducting a Five-Year Review at any site. While EPA (and DEQ) can use contractor services or other agencies to provide assistance in conducting the Five-Year Reviews, EPA is ultimately responsible for making the determination whether the remedy is protective.

The public was involved in the Five-Year Review process through interviews and a public meeting.

22. The current Five Year Review of the MPTP Site remedy refuses to independently review the quality of the cleanup. Conclusions and decisions need to be independently verified/corroborated.

(D13), (D61), (E10), (I1), (I16), (J3), (J12), (O5)

DEQ Response: Please refer to Response #21 above.

23. The Five Year Review needs to evaluate if cleanup levels for dioxin in groundwater are adequate given the new lower standards. A comparison of dioxin levels in groundwater at MPTP with background levels of dioxin in groundwater at other urban areas would be helpful for the public to understand the magnitude of dioxin levels. Evaluation of long-term fate of dioxin in groundwater needs to be incorporated into the evaluation of dioxin cleanup levels to meet current water quality standards.

(D31), (D39)

DEQ Response: See response to Comment #6 (and also the response to Comment #12 for a discussion of the lack of databases with background dioxin groundwater concentrations in urban areas).

24. Why does it appear that the recommendations given in the last Five Year Review of the MPTP Pant have been ignored; have they been ignored? Please provide a detailed discussion of which of the

recommendations have been ignored, why they have been ignored, and what will be done to implement them including with a timeframe for implementation.

(Q3)

DEQ Response: The Third Five-Year Review included the following five recommendations:

- 1. Modify the existing Controlled Groundwater Area established in October 2009 to address significant increases in groundwater withdrawals from existing infrastructure that are planned in the vicinity of the Site.*
- 2. Remove pentachlorophenol contaminated soil beneath power poles.*
- 3. Clarify the points of compliance for groundwater to reflect the current configuration of Silver Bow Creek, the current pentachlorophenol plume distribution, and the updated conceptual site model.*
- 4. Develop and implement permanent institutional controls to prevent future on-Site residential use and restrict land use where waste has been left in place above levels that allow for unlimited use/unrestricted exposure.*
- 5. Through the appropriate decision document, adopt the August 2010 DEQ-7 chronic value for cadmium as a cleanup standard. The revised chronic standard does not require a change to the selected remedy because it meets the modified chronic value for cadmium, as well as the standard identified in the Record of Decision.*

Recommendations 1 and 2 have been implemented. Recommendations 3, 4, and 5 are partly complete or underway, as described below.

- Recommendation 3: A monitoring plan revision implemented in 2013 revised compliance points for current monitoring. DEQ will finalize compliance points once system equilibrium is established after the BSB wastewater treatment plant dewatering is completed.*
- Recommendation 4: Stakeholder discussions regarding developing and implementing permanent institutional controls to prevent future on-Site residential use and restrict land use where waste has been left in place above levels that allow for unlimited use/unrestricted exposure have occurred, but there has been no final resolution. DEQ prefers to finalize these institutional controls in conjunction with final design of the land treatment unit offload and protective cover. Once the design is finalized, a final determination of land use will be made so the institutional controls can be customized as needed.*
- Recommendation 5: Final documentation of a changed Applicable or Relevant and Appropriate Requirement will be noted in the appropriate decision document regarding an updated standard for cadmium and benzo(a) pyrene (and potentially other parameters).*

Reuse of the Site

Comments submitted to the ESD [G8, G7]

25. There is a rush to reuse the MPTP Site before it is safe; partly because this is a cash out site. Any talk of reuse of this land is premature until the threat to Butte's health and environment from the Plant is eliminated.

(B11), (C4), (D2), (D7), (D15), (D55), (F14), (H1), (M14), (O30), (R5)

DEQ Response: The Record of Decision defined the reasonably anticipated future use as recreational. The final remedial action for the site is planned to meet Record of Decision requirements and subordinate goals. Other future uses may be allowed, following an evaluation

of that use and the exposure anticipated, as controlled by the local land use and permitting process as well as deed restrictions.

Air Quality

Comments submitted to the ESD [G9]

27. Agencies should summarize for the layperson and distribute to the public the review findings for air monitoring health risks.
(D58), (D73), (F18), (F26), (M19), (M28), (O13), (O34)

DEQ Response: Although the Record of Decision does not require air monitoring, DEQ has conducted air monitoring around the land treatment unit in response to community concerns regarding odors and to ensure that contaminated materials were not “leaving the site” and causing a health concern. Air monitoring data indicated that the concentrations of volatile and semivolatile organic contaminants of concern that would be expected to be associated with air in the vicinity of the site (primarily pentachlorophenol) are below EPA Region 9 Regional Screening Levels (EPA, 2010). Not all compounds detected at concentrations greater than regional screening levels (benzene and acetaldehyde) can be directly attributable to contaminated soils at the Site; these compounds are not listed as contaminants of concern in the Site Record of Decision. The primary contaminant associated with the Site is pentachlorophenol; this compound has not been detected in the air monitoring samples. The compounds detected in the air monitoring samples are not exclusive to those at the Site, which makes it difficult to determine the source or sources of these compounds.

28. Local residents have had to endure tremendous odor problems caused by the MDEQ’s waste in place remedy.
(D28), (D70), (F23), (M25), (O10)

DEQ Response: Most of the Butte residents interviewed in 2016 identified that odor and dust associated with the land treatment unit operation had previously been a very significant issue in the community, but none of those interviewed identified odors or dust as an issue within the last 5 years. The lack of comments on the odors and dust issue corresponds to reduced activity at the land treatment unit over the last 5 years (i.e. discontinuation of tilling and less frequent application of irrigation water with the intention to reduce the volume of water stored in the land treatment unit retention pond). Those who discussed this issue during the interviews were notified that a final offload is being planned for the land treatment unit that could result in short-term odors or other impacts. Several of those interviewed indicated a need for timely notification of those potentially affected before such activities are initiated.

29. Why is the MPTP Site still out of compliance with emission standards for dioxin?
(D73), (F26), (M28), (O13)

DEQ Response: See response to Comment #6.