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Land Use Issues and Institutional Controls Analysis

Purpose
With support from the EPA Superfund Redevelopment Initiative, contractor E² Inc. has developed the following analyses to assist EPA Region 8 officials and Anaconda-Deer Lodge County planning staff to integrate remedial planning efforts, institutional controls design, and future land use planning priorities in order to help ensure the continued protection of human health and the environment at the Anaconda Smelter Superfund site.

I. INTRODUCTION

The Anaconda Smelter Superfund site is located in Anaconda-Deer Lodge County, approximately 25 miles northwest of the City of Butte, Montana. The site includes portions of three Anaconda-Deer Lodge County (ADLC) communities: Anaconda, Opportunity, and Fairmont. Copper smelting wastes generated through a century of industrial operations at the Anaconda Mining Company’s two smelters have contaminated over 300 square miles of soil, ground water, and surface water resources in the City of Anaconda and Deer Lodge County, Montana.

The Anaconda Smelter site was listed on EPA’s National Priorities List in 1983. Following a consent decree with the EPA, the Anaconda Mining Company demolished the smelter and ancillary facilities in 1984. Initial investigations to characterize soils, surface water, ground water, and solid wastes revealed wide spread contamination. In 1988, remedial investigation/feasibility studies began on various operable units throughout the site.

The EPA’s remedial and removal actions at the Anaconda Smelter site have taken place over the past twenty years. Removal actions have been taken to address contaminants posing immediate threats to human health and the environment. Time-critical removals, involving yard replacements and a residential neighborhood buyout, have been completed. Further remedial actions at the former site of the Anaconda Mining Company’s Old Works facility have fostered recreational uses, including the Jack Nicklaus-designed Old Works Golf Course and an interpretive recreational trail system. Today, EPA’s remedial planning efforts at the Anaconda Smelter site are focused on developing a strategy for the site’s long-term stewardship.

Remedial Planning

In 1998, EPA issued a Record of Decision (ROD) for the final operable unit at the Anaconda Smelter site. The Anaconda Water, Waste, and Soils operable unit (ARWW&S) addressed all remaining contaminated water, wastes, and soils throughout the 300 square mile site. Currently, EPA Region 8 officials are in the process of developing an Explanation of Significant Differences (ESD) that will revise the land use assumptions developed prior to the 1998 ROD and establish a system of institutional control mechanisms for the site.

The ROD established the use of a contaminant remediation strategy based on reasonably anticipated or future land use. The 1998 ROD required remediation of all properties to their current land use (at the time of ROD) with institutional controls providing for additional remediation at the time of development. The potential for the future use of properties within the Anaconda Smelter site will depend heavily on the effective implementation of future remedial activities, as well as the design and administration of the institutional controls required to help maintain the protectiveness of the site’s remedy.

With EPA oversight, the site’s responsible party, Atlantic Richfield Company (ARCO), manages the construction of the site’s remedy components. The company is responsible for operations and maintenance of waste repositories as well as the ongoing construction of long-term remedies. ARCO has proposed to
enter into a third-party institutional controls management agreement with Anaconda-Deer Lodge County (ADLC), through which the company would reimburse the local government for the cost of administration, implementation and enforcement of the institutional control mechanisms at the Anaconda Smelter site. Should ADLC enter into the agreement as written, the local government would take on an expanded role in the maintenance of the remedy and stewardship of the Anaconda Smelter site.

II. SCOPE OF ANALYSES TO FOLLOW

Through the Superfund Redevelopment Initiative, E² Inc. has been working with officials from EPA Region 8 and Anaconda-Deer Lodge County to identify opportunities to integrate the Agency’s remedy implementation with ADLC’s future land use planning and reuse goals. Based on a series of site visits, workshops, and analyses, E² Inc. has developed a set of recommendations for Region 8 officials and ADLC planning staff to consider in their efforts to protect health and the environment through the site’s remedy. The findings from E² Inc.’s analyses are presented in three sections: Remedy and Reuse, Institutional Controls, and a Map Appendix.

Remedy & Reuse
The first section identifies a set of potential challenges that Anaconda-Deer Lodge County planning staff will need to address, should the local government choose to enter into an agreement with ARCO to manage institutional control administrative activities at the site. The analyses highlight potential gaps in the local government’s institutional capacity, and identify potential barriers to the future use of properties affected by smelter wastes. These analyses were based on a review of the site’s 1998 ROD, the 2005 Global Institutional Controls Agreement, draft Institutional Controls Management Plan, as well as existing land use planning tools, including Anaconda-Deer Lodge County’s Development Permit System, and Growth Policy documents.

Institutional Controls
The second section provides a preliminary evaluation of the institutional controls proposed for the site. The analysis evaluates the IC mechanisms proposed in the 2005 Global Institutional Controls Agreement, and draft Institutional Controls Management Plan based on recommendations set forth in the EPA guidance Institutional Controls: A Site Manager’s Guide to Identifying and Selecting ICs at Superfund and RCRA Cleanups. The recommendations identify potential institutional control challenges that may compromise the effectiveness of the site’s remedy.

Map Appendix
Also included in the document is an annotated map appendix, created to help Anaconda-Deer Lodge County planning staff and EPA Region 8 officials to identify the types of land use planning tools and cartographic resources that are available for future land use planning and institutional controls implementation. The maps illustrated in this section were generated from a Geographic Information System (GIS) database, which is also provided on the CD titled Anaconda Issues Analysis: Map Appendix. The GIS maps highlight existing land use controls at the Anaconda Smelter Site. A discussion of the methods used to generate the maps, and a set of key reuse and IC planning considerations also accompany the map set.
III. REMEDY AND REUSE

Remedy Implementation & the Proposed Global Institutional Controls Agreement
The remedial approach outlined in the 1998 ROD requires the use of institutional controls to help protect human health and the environment at the Anaconda Smelter site. Since 1992, ARCO has contracted with the ADLC planning staff to perform a specific set of institutional controls administrative functions at the site. Anaconda-Deer Lodge County planning staff have administered the Development Permit System, a set of zoning ordinances adopted in 1992 to help maintain the protectiveness of the site’s remedy while allowing for future land use changes and new development. The DPS applies to all new development and land use changes within a designated Superfund Planning Area Overlay District. The remedial design approach for arsenic contaminated soils serves to illustrate how the DPS is intended to help to maintain the protectiveness of the remedy.

The DPS requires that property owners follow additional sampling and materials handling protocols for all new development and land use changes within the Superfund Planning Area Overlay District.

1. Property owners must apply for a permit at the ADLC planning department.
2. Pre- and post-development tests are required to identify soil arsenic concentrations. Three categories of future uses have cleanup definitions for arsenic contaminated soils:
   - Residential 250 ppm
   - Commercial / Industrial 500 ppm
   - Open Space / Recreation 1000 ppm
3. If pre-development sampling reveals soil contaminant concentrations above the remedial action level for the desired land use, additional clean up is required.
4. Property owners can choose to contain contaminated soils on site or can haul the materials to the Opportunity Ponds waste repository.
5. Post-development sampling will be required to confirm that arsenic concentrations have been remediated to a level below the required threshold.

Through the 2005 Global Institutional Controls Agreement (Global IC Agreement), ARCO proposes to transfer to ADLC planning staff a number of significant long-term responsibilities, including the administration of the DPS and additional institutional control mechanisms, the operation and maintenance of mine waste repositories and restricted areas, and future remedial construction activities. However, it is the site's PRP ARCO that bears the responsibility for the site’s contamination, not Anaconda-Deer Lodge County. It is critical for ADLC planning officials to recognize that the local government is under no obligation to take on the responsibilities that ARCO has for the site’s contamination. The language in the Global IC Agreement seeks to transfer significant remedy management and implementation responsibilities to ADLC. As the following analyses highlight, ADLC does not currently have the capacity to carry out a broad range of institutional control management responsibilities. The local government may be in a position to continue performing certain administrative activities on ARCO's behalf, but the ADLC planning staff should not be in a position to take on significant responsibilities for the implementation of the institutional controls component of the remedy at the Anaconda Smelter site.

Highlighted in following discussion are two critical issues related to local land use planning and site reuse that EPA and Anaconda-Deer Lodge County should consider in order to ensure effective long-term stewardship at the Anaconda Smelter site: government capacity to handle future stewardship responsibilities and remedy related reuse barriers.
Local Government Capacity: Increased Stewardship Responsibilities
The remedial strategy at the Anaconda Smelter site establishes the need for a long-term stewardship approach to reuse. As a result of the site’s size and the complexity of remedial activities, contaminated media will remain in place on many portions of the site. Institutional control (IC) mechanisms will be used to maintain the protectiveness of the remedy wherever waste is left in place. The institutional control mechanisms proposed in the draft Institutional Controls Management Plan for the site include:

- **Government Controls** – Land use controls based on a government’s police power, such as zoning maps and ordinances. ADLC’s Development Permit System and Growth Policy documents designate a Superfund Planning Area Overlay District and a specific set of DPS zoning regulations applicable to properties within the district. (See Maps 1-3 in the Map Appendix for more information)
- **Environmental Use Restrictions** - State-specific statutes in the form of several easements designed to deal directly with implementing ICs, often with the idea of conserving natural resources.
- **Permits** - Issued by a government agency to ensure compliance with laws and regulations, often used to establish enforceable requirements or authorize certain acts. The DPS, administered by Anaconda-Deer Lodge County planning staff, requires landowners, tenants, and other users to obtain a permit for new development, land use changes or construction on properties within the Superfund Planning Area Overlay District.
- **Groundwater Use Restrictions** - A specific classification system used to protect well water quality, usually operated through the state well permitting system. Local governments also restrict land and building uses to prevent contamination and may establish a groundwater permit system.
- **Dedicated Developments** - Areas with specific or dedicated land uses, which are not intended to change, often the land use is of a public nature. The Old Works Golf Course and Old Works Trail System are currently established as dedicated developments at the Anaconda Smelter site.
- **Community Information Dissemination** - Education, awareness, and outreach activities to increase the community’s knowledge about Superfund properties, relevant contaminants, and applicable regulations through correspondence, informational packets, and town meetings. These materials have not yet been developed for the Anaconda Smelter site.
- **Restrictive Covenants** - Promises made by a landowner in connection with a conveyance of property. This may include a promise by someone holding an interest in the land to refrain from using the property in a certain way. ARCO has conveyed numerous properties with covenants restricting future land uses. (See the analyses presented with Map 5 in the Map Appendix for further discussion of properties conveyed with restrictive covenants)
- **Other deed-based restrictions** - Deed notices are non-enforceable, informational provisions that alert anyone performing a title search to important information about that particular property. (See Map 5 in the Map Appendix for further discussion of properties conveyed with deed notices)

If ADLC accepts the terms outlined in the 2005 Global IC Agreement, the success of the remedial strategy at the Anaconda Smelter site will rely on ADLC’s ability to track, manage, and implement the proposed institutional control mechanisms. There are three specific areas that present challenges for local land use planning capacity: overlay district designations, land use tracking capacity, and future land use mapping gaps. ADLC will need to expand its capacity in these areas in order to integrate institutional control mechanisms into a countywide land use planning system.

**Challenge: Overlay Districts**

Current land use planning tools available to the local government include the recently adopted ADLC Growth Policy (a county-wide planning document equivalent to a comprehensive master plan) and the Development Permit System, which specifies countywide zoning regulations. The Growth Policy identifies planning goals for the City of Anaconda and Deer Lodge County at different scales and levels of resolution. Planning areas, overlay districts, and specific land use designations are identified throughout the county. Many
different planning areas overlap with existing contamination at the Anaconda Smelter site. For example, areas in the City and County affected by smelter related wastes are included in three different overlay districts: the Open Space Overlay, Waste Management Area, and Smelter Overlay Planning Area. Former growth policy documents had designated one Superfund Planning Area Overlay District, however ADLC planning officials found that this designation discouraged potential developers or future users. While certain steps need to be taken to address the stigma of the Superfund site designation, the proposed overlay district revision makes the existence of smelter related waste less explicit in the master-planning document and could potentially limit the government’s capacity to address the challenges of waste left in place throughout the site.

Solution: One Cohesive Overlay District

As ADLC officials approach the task of updating land use planning tools in the future, one clearly designated section of the comprehensive plan needs to establish the local government’s approach to contamination at the Anaconda Smelter site. In order for ALDC planning officials to determine which properties should be subject to DPS requirements, the Superfund Planning Area Overlay District must identify all of the properties affected by smelter related wastes. Within that Superfund Planning Area Overlay District, specialized overlay tools could be designed to help planning officials apply the specific DPS requirements necessary to implement the appropriate land use controls. For example, EPA Region 8 officials have recommended a revised set of overlay designations within the Superfund Planning Area Overlay District. These proposed changes envision a community overlay where redevelopment would be permitted, as well as a waste management overlay where redevelopment could occur within the structure of DPS land use controls. A third open space overlay would serve as tool to designate undeveloped properties requiring additional remediation prior to redevelopment. The overlay district name could simply be revised, in order to address local concerns about the stigma of the “Superfund Planning Area Overlay District.”

Challenge: Land Use Information Tracking Capacity

In order to administer the development permit system in a manner that ensures the protectiveness of the site’s remedy and allows for reuse, ADLC will need an adequate tracking system for parcel and land use information. Planning staff will need to track and manage complex information for all properties within the Anaconda Smelter site, including current ownership, remedial status, future land use designations, and applicable institutional controls. Currently, land use mapping information exists on paper maps and a separate branch of the ADLC government manages parcel data. ADLC’s current capacity to assume additional land use tracking and administrative responsibilities is limited.

Potential Solution: Geographic Information Systems Database

A countywide geographic information system (GIS) would provide ADLC with enhanced database management and mapping capabilities. GIS technology would have the capability to link spatial mapping information with parcel specific data, consolidating critical information in one place. This would allow staff to more effectively manage and track institutional control mechanisms, including the DPS requirements, permit history, environmental use restrictions, restrictive covenants, and deed-based restrictions. Such a system would require additional hardware, software, and GIS-trained staff members. (See the Map Appendix for further discussion of GIS-based IC tracking issues) An additional layer that could be added to the GIS system to strengthen it and provide support for the institutional controls managed through the GIS system would be implementation of a One-Call system. Participation in a One-Call system would ensure that ADLC planning staff receives notification prior to any excavation or drilling activities that might occur on the properties affected by the Anaconda Smelter Superfund site.
Challenge: Land Use Mapping Gaps

E² Inc.’s effort to identify future land use designations at the Anaconda Smelter site revealed significant gaps and inconsistencies in ADLC’s existing land use mapping. Detailed future uses are designated on maps for the City of Anaconda only. Many areas in Deer Lodge County do not have future use designations, and no single map shows how countywide uses are aligned. For example, the Anaconda Development Area, within the formerly defined Superfund Planning Area Overlay District, includes vacant land, commercial, industrial, and residential uses. ADLC officials and local stakeholders have expressed an interest in commercial uses for this area. However, current land use designations indicate that the area should be reserved for low-density residential uses. ADLC’s mapping could be refined to designate detailed future uses outside of Anaconda. Additionally, ADLC planning officials could benefit from a single map illustrating how overlay districts and general future use designations are aligned.

The current mapping gaps also present challenges for EPA’s efforts to identify reasonable anticipated future land uses. Overly narrow or inaccurate future land use assumptions may limit opportunities for reuse. According to the remedial strategy for the site, if EPA assumes that a property’s future use will be commercial, no remedial action will occur until a commercial demand for that property materializes. In the meantime, site owners may wish to use the land for recreational uses that require a lower level of remediation. If no commercial demand emerges and no remedial action occurs, the property would remain contaminated and the land use assumption driving the remedy would have prevented the property’s recreational reuse.

Potential Solution: Land Use Planning Process

EPA could support an effort by Anaconda-Deer Lodge County officials to engage key property owners, and community stakeholders in a dialogue about future land uses and reuse opportunities at the Anaconda Smelter site. EPA guidance from 2001, titled Land Use in the CERCLA Remedy Selection Process, suggests that local land use planning processes can be useful tools for helping develop future land use scenarios at Superfund sites (OSWER Memorandum 9355.7-04). The community involvement section of the land use directive provides specific guidance in this area: “Where there is substantial agreement among local residents and land use planning agencies, owners and developers, EPA can rely with a great deal of certainty on the future land use already anticipated for the site. For other NPL sites, however, the absence or nature of a local planning process may yield considerably less certainty about what assumptions regarding future use are reasonable” (OSWER 9355.7-04).

A local land use and reuse planning process could provide substantial benefits to both ADLC and EPA. Through a multi-stakeholder land use planning process, ADLC could obtain the public input necessary to update its local land use mapping. The process could provide a public forum to help the local government delineate the Superfund Planning Area Overlay District boundaries and sub-districts, and identify stakeholder goals for future uses in portions of the county where land uses are currently undetermined or uncertain. The process could also help EPA officials identify a range of realistic land use scenarios for targeted areas in the county. The areas of Opportunity and East Anaconda are two parts of the Anaconda Smelter site where realistic future use scenarios could be developed through a multi-stakeholder process.

EPA is currently in the process of assembling an Anaconda-Deer Lodge County land use map to guide its revised future land use assumptions to be documented in the forthcoming ESD. As EPA makes its future land use assumptions about properties at the Anaconda site, it will be necessary to carefully consider interim uses as well as long-term future uses. EPA’s reuse assessment guidance specifies that, “Large sites, or sites with several operable units and potentially different future use scenarios, may benefit from multiple reuse assessments, or an iterative approach to developing land use assumptions” (OSWER Memorandum 9355.7-06P). In the near future, the Agency should obtain additional input from a broad-based stakeholder group to verify its land use assumptions and to develop a set of realistic reuse possibilities.
Potential Reuse Barriers

As EPA moves forward with its decision making at the Anaconda Smelter site, it will be important for Region 8 officials to identify remedy related barriers to the future use of properties. The following section highlights the challenges that EPA and local officials face in identifying and addressing these potential reuse barriers. Outlined below is a set of communication strategies that could be employed in order to limit the constraints to both public and private sector-driven reuse opportunities.

Challenge: Resolving Differing Perceptions of Reuse Barriers

Initial feedback from Anaconda-Deer Lodge County and the Anaconda Local Development Corporation officials suggested that there was a significant amount of developer interest in portions of the Anaconda Smelter site. Officials suggested that contamination at the site had deterred potential buyers and was limiting the community’s economic development capacity. In response to this input, E² Inc. proposed to assist EPA in its efforts to identify potential reuse barriers at the Anaconda Smelter site through a series of interviews with prospective developers and a team to address prospective purchaser inquiries.

A lack of comprehensive information on developer interest in redeveloping parcels within the Anaconda Smelter site has limited the extent to which reuse barriers can be fully characterized. Local economic development officials were unable to provide contacts for potential property buyers, and the prospective purchaser inquiry rapid response team received only one call from an interested developer. The prospective purchaser was interested in obtaining funding through the Brownfields program for an economic development initiative at the Anaconda Smelter site. The rapid response team provided assistance to the individual, clarifying that the Anaconda Smelter site is a Superfund site not a Brownfield site. Further, the rapid response team clarified that EPA’s authority to support redevelopment efforts at Superfund sites is far more limited than it is at Brownfield sites. It was also noted that properties within the Anaconda Smelter Superfund site could become eligible for Brownfield funding, only after the site has been deleted from EPA’s National Priorities List. There is a need to provide adequate and accessible information about the scope of EPA’s involvement at the Anaconda Smelter site.

While there are no easy solutions or clearly prescribed steps to address all the challenges presented here, there is a need to resolve the differing perspectives on the affects of the Anaconda Smelter site’s contamination on developer interest in Anaconda-Deer Lodge County. Below is a set of questions that will be important to consider in addressing these challenges:

- Are there prospective developers interested in properties within the Anaconda Smelter site?
- Is the limited redevelopment of the site so far attributable to residual contamination or waste left in place at the Anaconda Smelter site?
- Is there an adequate system for disseminating information to prospective purchasers about the scope of EPA’s involvement at the Anaconda Smelter site, the availability of federal funding for redevelopment at the site, and other relevant site information?
- What mechanisms for follow through exist or can be created to ensure that developer interest leads to redevelopment?

Challenge: Waste In Place

The remedial strategy proposed for the Anaconda Smelter site allows unconsolidated waste to remain in place at properties outside of the Anaconda City limits where future uses are currently undetermined. If agreed to by the local government, the 2005 Global IC Settlement Agreement would transfer responsibility to ADLC for managing remedial activities such as soil removals, contaminant consolidation and sampling. Ultimately, this means that land owners wishing to change land uses in the future or redevelop properties will need to know where waste exists, which mechanisms are available to help remove contaminants, how remediation services would be paid for, and which permits are required. According to EPA’s guidance for determining
reasonably anticipated future land uses, “CERCLA does not prevent them [landowners] from conducting such a cleanup as long as protectiveness of the remedy is not compromised.” At the Anaconda Smelter site, issues of site size and complexity will require an adequate system to ensure that landowners can safely and effectively remediate properties in a way that does not create unnecessary barriers for reuse.

The 2005 Global IC Agreement proposes for the development permit system and a developer’s information packet to serve as the primary mechanisms for informing land owners and tenants about site contamination and explaining the required steps that land owners and tenants must take when developing, working on or changing land uses at affected properties. A clear and accessible communication system needs to accompany the DPS to provide landowners and other property users with relevant information about Superfund liability, required development permits, and an appropriate protocol for addressing future remedial work. The following information needs to be available:

- What liability protection provisions are available to prospective purchasers? Currently, there is uncertainty over the impact that the remedial approach might have on the Bona Fide Prospective Purchaser limitations established in the 2002 Brownfields Amendment. Further analysis of the ‘s impacts could potentially help to resolve this uncertainty.
- What permits are required for new development within the Superfund Planning Area Overlay District? How can landowners obtain the appropriate permits?
- How should landowners handle contaminated media during construction?
- What options are available to ensure that contaminated media removed from a property is handled safely and consolidated in an appropriate facility?
- Is funding available for future remedial actions? If so, what do landowners need to do to take advantage of this opportunity?

Potential Solution: An effective model for the Development Permit System

Developing an integrated institutional controls system managed by a single agency and funded entirely by the PRP with clear procedures; free permits and removals; and regular and transparent information dissemination could be the answer. This is the strategy employed at the Bunker Hill site in Idaho. That community spent seven years planning for and designing the Institutional Controls Management Plan (ICMP) currently in place, which includes a local ordinance that makes compliance with ICs legally enforceable, prohibits digging without a permit, makes mandatory the licensing of all local contractors, offers 24/7 availability of an approved disposal site for contaminated soils, provides a full time inspector, and makes available the free removal of certain quantities of contaminated soil and its free replacement with clean fill. This ordinance is integrated with a One-Call system and a permit system run by the same regional health agency.

This integrated IC system has now been in place for ten years and has not needed to take a single enforcement action. The transparency of the ICs and the proactiveness of the community set the bankers and developers at ease and have helped ensure economic growth, attracting a multimillion-dollar ski resort to the area. Through the ICMP that the Community Task Force helped create, they designed a remedy that saved the mining companies $160 million and saved EPA $70 million in remediation and other costs. The site’s remedy was designed and implemented in a way that limited the potential barriers to local economic development.

As EPA and Anaconda-Deer Lodge County move forward with ongoing remedial work and long-term stewardship planning at the Anaconda Smelter site, it will be necessary for the Agency and local government representatives to address the gaps in local land use planning capacity as well as the potential reuse barriers highlighted in this section.
IV. INSTITUTIONAL CONTROLS

This section focuses on the proposed institutional controls (ICs) for the Anaconda Smelter site as they are presented in the Draft 2000 Institutional Controls Management Plan and the proposed 2005 Global Institutional Controls Agreement between the county and ARCO. Well-designed and implemented ICs can be key to preventing or overcoming some of the potential reuse barriers discussed above. The various ICs listed in the introduction are assessed against the nine factors CERCLA requires for evaluating remedial options and the recommendations set forth in the EPA guidance *Institutional Controls: A Site Manager's Guide to Identifying and Selecting ICs at Superfund and RCRA Cleanups*. The ICs at the Anaconda site have implications for local government capacity, consent decree negotiations, future remedial activities, and the protectiveness of the remedy.

The two indispensable factors that must be met for these ICs to be eligible for selection include protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). Five additional factors should be balanced against one another to create an optimal mix of attributes in the proposed ICs:

- long-term effectiveness and permanence;
- reductions of toxicity, mobility, or volume through treatment;
- short-term effectiveness;
- implementability;
- and cost.

Finally, two factors that should be used to modify that optimal mix are State and community acceptance of the proposed ICs. These nine factors are outlined in guidance on requirements for selecting remedies in CERCLA and the NCP (§ 121 and 40 CFR 300.430), which also stress the importance of evaluating ICs as rigorously as any other remedial alternative.

EPA made extensive comments on the 2000 ICMP provided by ARCO, and as of December 2005, this incomplete document provided the only official record of institutional controls proposed for the site. However, ARCO also developed the 2005 Global Institutional Controls Agreement (Agreement), which spells out in much more detail than the 2000 ICMP how the ICs for Anaconda might be implemented by both ARCO and ADLC. Several of the provisions of the Agreement on ICs for the Anaconda site impact the various factors listed above. A few representative provisions of the Global ICs Agreement are presented below under the most appropriate CERCLA factor along with that provision’s challenges for the effectiveness of the ICs. This analysis of the implications of the Agreement on the Anaconda site’s ICs could be applied to similar provisions in a revised ICMP. Many of the provisions below affect multiple CERCLA factors.

**Long-term Effectiveness**

Long-term effectiveness is one of the most important factors at a site like Anaconda Smelter, which will rely on delayed remediation and institutional controls to protect human health and preserve reuse options. The *Site Manager's Guide* lists the “political and fiscal constraints that may affect the ability of the state or local government to enforce” ICs as the primary areas to evaluate for this factor. Many of the provisions that affect long-term effectiveness also have a direct impact on the total cost of the chosen mix of remediation and ICs over the long term.

*Provision:* The Agreement upholds the 1994 conveyance terms and covenants, which give ARCO enforcement authority for the restrictive covenants.

*Challenge:* Sole enforceability by ARCO of ICs restrictions could have detrimental consequences for their long-term effectiveness. The persistence of a company can never be assured and should the capacity or will of the company to enforce these covenants diminish in the future no other agency would be able to step in.
As written, EPA may not be able to pursue infractions of the covenants, which could hamper the Agency’s ability to ensure their long-term effectiveness.

OSRE guidance from 2004 entitled “Institutional Controls: Third-Party Beneficiary Rights in Proprietary Controls” offers a possible solution to this situation. The guidance states, “Regions should consider the third-party beneficiary approach whenever a proprietary control is used.” The third-party beneficiary arrangement allows one party, such as the State or PRP, to hold title to a piece of real property, while the easement or covenant specifically grants third-party beneficiary rights of enforcement to EPA. The site attorney must examine whether the State 1) recognizes third-party beneficiary doctrine and 2) whether State law indicates if third-party beneficiary interests are considered an interest in real property. This research is necessary to ensure that EPA complies with the limitations on holding title to real property set forth in CERCLA § 104(j). The guidance asserts however, that the “Regions may use this approach under any circumstance where EPA enforcement may help ensure the reliability of the control.” Modification of the covenants pertaining to properties within the Anaconda Smelter site, such that EPA is included as a third party beneficiary, would make the covenants enforceable by the government as well as by ARCO, enhancing their long-term effectiveness.

**Short-term effectiveness**

Certain provisions of the Agreement create the possibility for situations that could hinder the short-term effectiveness of the Anaconda site’s ICs. The single most important way to guarantee the short-term effectiveness of the site’s ICs is expansion of ADLC’s capacity to oversee and implement its new responsibilities for the proposed ICs. Current county capacity would not be able to effectively implement the activities and responsibilities outlined in the Agreement for ADLC.

**Provision:** The terms of the General Trust state that ARCO’s approval is required for any ADLC expenditure in excess of a 5% increase over expenditures in the previous year.

**Challenge:** Implementation of the proposed ICs would be impossible with current ADLC capacity, both in terms of budget and staff. ADLC needs additional technical capacity to manage the GIS system and additional staff to oversee the extensive array of ICs described in the ICMP. Funding for training and additional staff will exceed a 5% increase over the previous year’s budget. Should ARCO fail to approve increases for these or other staff needs, the immediate effectiveness of the ICs would be seriously impaired by current staff’s inability to manage the proposed ICs workload. The beginning of the county’s responsibility for ICs may be a period prone to difficulties due to the high proportion of new staff and their learning curve for managing the ICs. This might be a time when the county could benefit from additional assistance with oversight and implementation of the various ICs.

**Implementability**

The Site Manager’s Guide defines implementability as the “administrative feasibility of activities that need to be coordinated with other agencies.” The Guide urges consideration of the responsible entity’s “jurisdiction, authority, willingness, and capacity to establish, monitor, and enforce ICs.” Implementability directly influences the effectiveness of the proposed ICs. However well designed a control is, if it cannot be implemented, it cannot serve its purpose. This factor also links closely to cost; EPA comments on the ICMP state that, “funding for ADLC will be critical to ensure they implement the ICs properly.” Proper implementation of the ICs will also be critical to the success of any future reuse of the contaminated parcels where exposure pathways will be controlled by ICs. Some of these linkages are explored briefly below.

**Provision:** The Agreement stipulates that ADLC will be responsible for O&M activities for a variety of properties including the 1994 Conveyances, the Mine Waste Repository, and the SPAOD properties.

**Challenge:** O&M activities are more predictable in terms of cost than remedial activities, making them easier to plan for and implement. However, a shortage of funds in the General Trust Account, or emptying it entirely (which is one of ARCO’s options in case of default), would seriously impair the ability of ADLC to carry out the O&M and IC maintenance duties outlined in the Agreement.
Provision: The General Trust includes a provision that passes unlimited liability for remediation and maintenance of all Superfund properties from ARCO to ADLC after Trust funds are exhausted.

Challenge: Some properties to be conveyed have not been characterized, such as the Airport property, which is to be conveyed without any remediation or investigation to determine if remediation might be necessary. Even a small number of remedial actions could seriously deplete the funds in the Protective Use Trust account, and any number of remedial actions that became necessary after Trust funds are gone would bankrupt the county. Insufficient Trust funds combined with chronic ADLC budget constraints could seriously impair the implementability of the ICs due to ADLC’s inability to comply with their implementation and monitoring responsibilities. This could require additional EPA involvement in the future to address pressing IC effectiveness problems.

Provision: The Agreement does not mention anywhere how the problem of attic dust will be handled.

Challenge: Similar to the Airport property, the lack of a full characterization of this problem leaves ADLC with potentially significant remediation or IC implementation obligations that have not been specified in the Work Plan or budgeted for in the Trust accounts.

Cost
A full accounting of the long-term costs of ICs activities at the Anaconda site is needed to secure an adequate level of long-term financial assurance. A great need still exists for substantive, realistic cost assumptions to inform further negotiations and evaluate options at this site. In conjunction with deferred remediation, the Agreement contains several provisions proposing cost sharing structures that rely on some payment by ARCO, some future financial liability for ADLC, and some cost to property owners. For trails, ARCO is responsible for construction, while ADLC is solely responsible for maintenance and may not use Trust funds for this activity. The cost sharing structure for weed control on the other hand is: 50% ARCO, 25% ADLC, and 25% property owners. A main concern for implementability and long-term effectiveness is what would occur when the Trust Accounts run out of money. If Trust funds are insufficient to cover necessary work, and the parties responsible for that work (ADLC and property owners) are unable to fund it themselves, implementing these ICs becomes impossible. EPA comments on the ICMP state in the Design Objectives that “ICs should not be used to shift liability from named PRPs to other landowners.” Such a situation could necessitate resumption of negotiations between EPA and ARCO over funding for remedial/IC activities necessary to maintain the protectiveness of the remedy. ICMP comments continue, stating, “EPA will not enforce independent agreements between ARCO and landowners. If ARCO obligations are not fulfilled, EPA will enforce against ARCO, regardless of third party landowner agreements that discuss such obligations.” If EPA intends to hold ARCO ultimately responsible for the remediation and long-term stewardship of the Anaconda site, it is unclear how this cost sharing structure meets that goal.

Provision: The Agreement stipulates that ADLC will fund 25% of the cost of weed control by obtaining grants from State/federal programs. If ADLC cannot fund its 25%, those costs pass to the property owner, who then becomes responsible for 50% of these costs.

Challenge: Considering county capacity to generate or obtain funding and the low probability of ADLC obtaining sufficient grants to fund their contributions to weed control and trail maintenance every year for the next 25 years, the implementability of these provisions appears minimal. The community will most likely not find this costing structure to be acceptable over the long-term.

Provision: The Agreement specifies that the funds in the General Trust can be used for three things: actions described in the Work Plan, O&M for the 1994 properties, and the salaries and benefits of ADLC staff.

Challenge: Financial assurance is of paramount importance at this site due to the delayed remediation and long-term stewardship requirements of the site. How the Trust accounts are defined and established is critical to ensuring that all appropriate IC actions may be funded under their auspices. Since the actions described in the Work Plan were not included in the Global IC Agreement, it appears that allowing the General Trust to fund Work Plan actions covers the funding of IC implementation and monitoring actions for the Anaconda
site. However, knowledge of the specific actions defined in the Work Plan will be necessary in order to confirm that all appropriate IC actions will be able to receive funding from the General Trust account.

**Community Acceptance**

Community acceptance is a modifying factor that becomes increasingly important as the role of the community in implementing the remedy becomes significantly expanded. EPA comments on the 2000 ICMP state that, “public acceptance of ICs is a major design consideration. ICs are less likely to be heeded and enforced if the community does not accept them. ICs accepted by the public must consider such attributes as public confidence and understandability.” It is unclear what, if any, input the community had in designing the Agreement that outlines many new duties and financial burdens for ADLC. Lack of ADLC input into the Agreement cannot facilitate community acceptance of its provisions. The Agreement relies explicitly on cooperation, collaboration, and negotiating in good faith between ARCO and ADLC. Yet these characteristics have been notably absent in their recent relationship. Should the present lack of trust remain unchanged, the necessary negotiations and collaboration between ARCO and ADLC would not be possible.

*Provision:* The language of the proposed Agreement states that ADLC “must” share sampling data with ARCO, but that ARCO “may” share sampling data with the county.

*Challenge:* This kind of language is at least partially responsible for the current lack of trust between ARCO and ADLC. Lack of information sharing diminishes a sense of collaboration and the chance for acceptance of the Agreement. A standardized sampling protocol and increased data sharing would help ameliorate current asymmetric information, which hinders trust and could endanger human health and the environment if information on the location and degree of contamination were not disseminated in a timely manner.

*Provision:* The Agreement does not explicitly state the amount of funds to be made available in the Trusts.

*Challenge:* A well designed Memorandum of Understanding (MOU) or ICMP can serve to link state environmental regulations and local land use policies and practices. An MOU could outline the roles and responsibilities of the local government, PRP, state government, EPA, and/or other stakeholders in the long-term implementation and management of the ICs for the Anaconda site. For example, the city and county of Denver and the State of Colorado tailored a model MOU to fit their specific site, relevant regulatory frameworks, and the other stakeholders involved in ICs. The model MOU in place in Denver helps minimize exposure risks, engender local acceptance, and ensure effective remedies for the long term. An MOU that codifies the activities and obligations of each stakeholder could help ameliorate current information asymmetry and create a more collaborative process. ADLC officials however, expressed resistance to signing any MOU that does not contain substantive cost estimates for all the activities outlined in the Agreement.
V. CONCLUSIONS AND NEXT STEPS

As EPA and Anaconda-Deer Lodge County move forward with the remedy, future land use decisions, and final consent decree negotiations, the considerations presented in these analyses will become increasingly important. ADLC has identified several of the local government capacity gaps presented here as critical issues to address in the immediate future. Local government officials have also discussed the need for an additional land use planning process. EPA Region 8 officials are currently developing future land use designations for the Anaconda site, and working with ARCO to approve an ICMP.

The following points illustrate steps EPA Region 8 could take in order to implement these recommendations:

- **Local Government Capacity**: In the near future, a new block of funding will become available to Anaconda-Deer Lodge County. The Agency could assist ADLC planning officials in maximizing the benefits from these additional funds by targeting gaps in IC planning tools and capacity building. Revising the existing growth policy and development permit system or providing new GIS capabilities with an integrated land use management database could be two priority areas.

  E² Inc. has developed the Map Appendix in this document to help enhance local land use mapping resources. These maps provide Agency officials with accurate information for its future land use assumptions. The Appendix offers updated mapping resources for ADLC to use in assessing its capacity to perform future IC related administrative activities.

- **Addressing Potential Reuse Barriers**: For EPA, short-term efforts could be directed towards building local considerations into remedial planning, in order to avoid the potential reuse barriers discussed above. Additional considerations could include: obtaining community input to identify both short and long-term future land use goals and to characterize the costs to landowners and ADLC of leaving waste in place as part of the remedial strategy. Community input could help the Agency refine its reasonably anticipated future land use assumptions and cost quantification efforts. The community input could be invaluable assets to EPA as it plans for final consent decree negotiations with ARCO.

- **Separation of Remediation from O&M Responsibilities**: The county has expressed willingness to oversee O&M activities for the institutional controls, but prefers not to be responsible for remediation. Within the O&M responsibilities contemplated for ADLC an important distinction lies in county management of O&M for institutional controls versus O&M for engineered components of the remedy. Institutional controls, such as zoning and the DPS, lie within the purview of local government responsibilities, while O&M for the Mine Waste Repositories essentially converts a local government into the operator of a hazardous waste disposal facility.

- **Ensure Sufficient Funds for any Trust Accounts**: The county’s willingness to help oversee the ICs for the Anaconda Smelter site, even assuming expanded county capacity, can extend only as far as the resources they are provided with to do that job. If the protectiveness of the remedy relies on ADLC implementation and oversight of crucial components of the remedy, such as ICs and O&M, then the county must be funded appropriately to be able to carry out those important responsibilities. Ensuring sufficient funding for any proposed ADLC duties will be essential for EPA to keep in mind during upcoming Consent Decree negotiations with ARCO. Only with adequate funding can ADLC help ensure the protectiveness of the remedy.
VI. MAP APPENDIX & GIS DATABASE

Purpose
Contractor E² Inc. has developed the following GIS database and map set to help EPA Region 8 officials and Anaconda-Deer Lodge County planning staff identify the status of existing land use and property ownership information at the Anaconda Smelter Superfund site.

Introduction
The maps presented in this appendix suggest one possible approach to developing an integrated property information system for Anaconda-Deer Lodge County (ADLC). EPA and ADLC will find the materials useful to consider as the local government evaluates the range of institutional control (IC) activities it may choose to administer on ARCO’s behalf at the Anaconda Smelter Superfund site. The purpose of the appendix is to demonstrate how land use controls can be tracked and managed through a Geographic Information System database.

The maps presented here are based on the best available information and do not constitute a complete set of all existing land use controls.¹ Two categories of existing land use controls at the Anaconda Smelter Superfund site are presented: 1) Zoning designations / overlay districts (Government Controls), and 2) Restrictive covenants and deed based restrictions (Proprietary Controls).

Government Controls
Anaconda-Deer Lodge County’s Development Permit System establishes local land use designations and regulations, including zoning districts, development districts, and overlay districts. Within the proposed system of institutional controls at the Anaconda Smelter Superfund site, the local government’s ability to regulate the use of private property rests on zoning district regulations and overlay districts. While EPA will have no role in determining how ADLC makes its local land use decisions, in order to protect human health and the environment at the Anaconda Smelter, the Agency requires that properties affected by smelter wastes have the necessary controls in place to limit public exposure to site contaminants and to ensure that the site’s remedy remains effective over the long-term.

Map 1: Anaconda Development Districts
The DPS designates detailed zoning districts within the Anaconda city limits. These are presented in Map 1. Outside of the Anaconda city limits, all land is designated low density residential. The Anaconda Development Districts Map is linked to the Anaconda-Deer Lodge County Parcel Database, and within the database the field “Zone_Dist” shows the designated zoning district associated with each parcel.²

¹ Existing land use designations were scanned from paper maps and overlaid on a set of aerial photographs of Anaconda Deer Lodge County. The land use designations were then entered into an existing parcel database provided by the State of Montana Cadastral Mapping Program. For more information on source and methodology, please see the GIS dataset and accompanying metadata.
² The Anaconda-Deer Lodge County Parcel Database is a publicly available listing of all properties within the City of Anaconda Deer Lodge County. The database contains attributes pertaining to each property including, ownership information, address, tax information, etc… This database is part of a statewide property information system called the Montana Cadastral Mapping Program, managed and regularly updated by the Montana Department of Administration and available on-line at: http://gis.mt.gov/
Key considerations:
EPA Region 8 officials are in the process of determining the reasonably anticipated future land uses for properties throughout the Anaconda Smelter site. EPA will use the current land use designations of all properties within the Anaconda city limits as the basis for determining appropriate cleanup levels. The Anaconda Development Districts shown on this map may be useful for EPA and ADLC to consider in planning for future uses.
The development district designations shown here express ADLC’s goals for future uses of the land. Accordingly, a vacant property may be designated for medium or low density residential land uses. ADLC and EPA officials will need to coordinate remedial and land use planning efforts to ensure that EPA’s remedial plans reflect the local government’s reasonably anticipated future land uses. The current use designations that property owners list on their property taxes are another method of determining current land use. However, these stated uses do not necessarily represent reasonably anticipated future land uses.

Map 2: Superfund Planning Area Overlay District
ADLC’s DPS and Growth Policy prescribe a set of zoning overlays, which represent an additional layer of land use control to complement, and in some cases to override, established zoning districts. The Superfund Planning Area Overlay District (SPAOD), discussed earlier in the Issues Analysis, is highlighted in Map 2.³ The purpose of the SPAOD is to define the areas of Deer Lodge County and the City of Anaconda affected by smelter wastes. A specific set of additional DPS regulations applies to properties within the SPAOD to protect landowners from exposure to waste left in place and to ensure that remedial structures are not damaged during construction. An additional set of specific land use classifications has also been established within the SPAOD. Brief descriptions of the overlay districts within the SPAOD are provided below.⁴

Overlay Districts within the Superfund Area Overlay District:

Waste Management Areas: Three Waste Management Areas are designated at the Opportunity Ponds, Anaconda Ponds, and Smelter Hill waste repositories to limit land use to the storage of mining and smelting related wastes.

Open Space: Open Space Areas allow for limited recreational uses in designated areas.

Anaconda Development District: The Anaconda Development District encompasses properties within the City of Anaconda that have a prior zoning designation, including portions of the East Anaconda Yards and the Industrial Park.

Airport Overlay: The Airport Overlay is primarily limited to the municipally owned airport northeast of Anaconda.


Heavy Industrial: A single Heavy Industrial zone designated within the SPAOD includes ARCO owned property to the south of MT Route 1 and east of Mill Creek Road.

³The Superfund Planning Area Overlay District boundaries and sub areas were delineated from a paper map titled “Superfund Overlay Area: Anaconda-Deer Lodge County, Montana.” Butte-Silver Bow GIS developed this map for Anaconda-Deer Lodge County in August 2004.
⁴ For more information on Anaconda-Deer Lodge County’s development districts, overlay districts, and comprehensive planning goals, see the following documents: Anaconda-Deer Lodge County Development Permit System (2002 and the Anaconda-Deer Lodge County Growth Policy (2004).
Agriculture, Grazing, and Recreational Areas: This additional category allows for rural lands affected by mining related wastes to remain undeveloped, but accessible for a range of open space uses.

The SPAOD Map, like the Anaconda Development Districts Map, is linked to the Anaconda-Deer Lodge County parcel database. The “Overlay” field designates any existing overlay districts associated with each parcel.

Key Considerations:
The SPAOD’s regulations spatial boundaries will be important components of the institutional control system at the Anaconda Smelter Superfund site. The specific restrictions within each overlay districts must be designed to address site-specific contaminants and waste left in place. The boundaries of the SPAOD will be the primary means of delineating properties subject to the specific DPS regulations and will also need to include all of the land affected by contamination at the Anaconda Smelter site.

The extent of the SPAOD shown on Map 2 corresponds to existing parcel boundaries. Accordingly, any property partially contained within the SPOAD has been considered a part of the SPAOD. This method of designating the SPAOD boundary would allow ADLC planning officials to easily determine whether a specific property would be subject to additional DPS requirements. However, if the SPAOD boundary needs to be drawn precisely, a different mapping method would need to be used, as the method used here would result in a larger total area for the SPAOD.

Map 3: Anaconda Development Districts / Superfund Planning Area Overlay
This map combines the Anaconda Development District designations illustrated in Map 1, with the Superfund Planning Area Overlay District (SPAOD) highlighted in Map 2. The area where the SPAOD and Anaconda Development Districts overlap is shown in the hatched pattern. Note that only four of the seven sub districts within the SPAOD appear on the portion of the map surrounding the City of Anaconda.

Key Considerations:
Local planning officials have targeted the overlapping area, known as the East Anaconda Development Area, as a priority area for redevelopment. EPA’s remedial plans for addressing residual contamination at properties within the East Anaconda Development Area will need to consider ADLC’s land use planning priorities. Currently, the East Anaconda Development Area districts designate light industrial, medium density residential and commercial future land uses. However, many of the properties designated for future land uses in the East Anaconda Development Area are currently vacant. EPA and ADLC will need to carefully consider the anticipated future uses for these properties; short-term and long-term future land uses scenarios may be important to develop for these vacant properties.

The approximate acreage of properties within the East Anaconda Development Area is summarized in the table below. Note the difference between the acres in development district designations and the acres in current land uses. The East Anaconda Development Area has a total of approximately 316 acres that are included in designated development districts (residential, commercial / industrial, or open space). Only 8 of the 51 acres zoned for residential uses are currently occupied; 20 of the 51 acres in residential development districts are currently vacant, and 23 are in recreational uses. Of the 258 acres zoned for commercial/industrial uses, 66 are currently in use, and 192 are vacant.

<table>
<thead>
<tr>
<th>Anaconda Development Area / Anaconda Development District Overlay Acreage</th>
<th>Acres in Development Districts</th>
<th>Acres in Current Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>51 acres</td>
<td>8 acres</td>
</tr>
<tr>
<td>Commercial / Industrial</td>
<td>258 acres</td>
<td>66 acres</td>
</tr>
<tr>
<td>Open Space / Recreation</td>
<td>7 acres</td>
<td>30 acres</td>
</tr>
<tr>
<td>Vacant</td>
<td>0 acres</td>
<td>212 acres</td>
</tr>
<tr>
<td>Total</td>
<td>316 acres</td>
<td>316 acres</td>
</tr>
</tbody>
</table>
**Proprietary Controls**

One of the challenges of implementing institutional controls at the Anaconda Smelter site will be ensuring that site remedies remain protective of human health and the environment over time and through the transfer of multiple properties. Since the Anaconda Mining Company ceased operations at the Old Works and Washoe Reduction Works facilities in the 1980’s, the company, and its successor ARCO, have sold significant real estate assets, some of which have been affected by smelter wastes.

In drafts of the Institutional Control Management Plan for the Anaconda Smelter site, ARCO has proposed the use of both proprietary and informational deed-based restrictions to control access and land use and protect the community and the environment. Proprietary controls are agreements based on real property law that use a variety of mechanisms to prohibit certain activities or restrict future land uses that could result in unacceptable risk to human health or the environment. Examples of proprietary controls include covenants, easements, servitudes, and state-specific environmental use restrictions, all of which can be enforced by the party who holds title and sometimes other entities as well if third party beneficiary rights are granted. Informational controls on the other hand are unenforceable and serve only to provide information or notification that residual contamination may remain on site or that a property may be subject to a number of other governmental or proprietary controls. Informational controls for the Anaconda site include efforts such as the Community Protection Program (sp?), deed notices, and public notice/advisories provided through the owner and developer informational packets.

**Map 4: Property Ownership**

Map 4 shows the parcels owned by Anaconda-Deer Lodge County, ARCO, and the State of Montana. This map also shows properties currently owned by ADLC, which the local government has acquired from ARCO or the Anaconda Mining Company. This map was created using a combination of parcel ownership information, a publicly available database obtained through the State of Montana’s Cadastral Mapping Program, and legal conveyance agreements provided by Anaconda-Deer Lodge County planning staff.

**Key Considerations**

As EPA oversees the implementation of the institutional controls system at the Anaconda Smelter site, the Agency will need to ensure that sufficient regulations are in place on all properties affected by site contamination, in order to prevent future risks of exposure or further contamination of the environment. IC mechanisms will need to help ensure that remedial structures, designed to consolidate waste-in-place, are not disturbed by current or future uses of the land. In many cases legal restrictions on the use of property will be required to help achieve these objectives.

In the draft Global Institutional Controls Agreement, ARCO proposes that ADLC will monitor and enforce a number of property-based restrictions that remain attached to specific properties regardless of ownership, including deed notices, and restrictive covenants. In order for these property-based restrictions to remain protective of the site’s remedy, property owners, as well as prospective purchasers must be aware that these restrictions exist. Anaconda-Deer Lodge County may chose to perform a number of tasks to support the implementation of the property-based IC mechanisms, which could involve tracking, monitoring, and enforcing the covenants and deed notices.

Interviews with Anaconda-Deer Lodge County planning staff, economic development officials, and EPA Region 8 officials revealed the need for a comprehensive property information tracking system. While it is outside the scope of these analyses to develop such a system, the GIS database and map set presented here will help to demonstrate how Anaconda-Deer Lodge County could track the status of restrictive covenants and deed-based restrictions that ARCO has placed on the properties previously transferred to the local government.
Map 5: ARCO Conveyed Properties
Map 5 separates the properties that ADLC has acquired from ARCO into two categories: 1) properties conveyed in 1986 without restrictive covenants, and 2) properties conveyed in 1994 with restricted covenants. The parcel ownership information shown here was obtained through a review of the 1986 and 1994 conveyance agreements, including the individual quitclaim deeds for each property. As with the previous maps, Map 5 is linked to the Anaconda-Deer Lodge County parcel database, the “Covenants” field associates each of the properties shown here with either the 1986 or 1994 ARCO Conveyance Agreements.

Key Considerations
While this map shows the ADLC-owned properties conveyed by ARCO, it does not include all of the properties that ARCO has conveyed to private property owners. However, the Anaconda-Deer Lodge County parcel database includes a field where ARCO conveyed properties could be recorded and tracked. Map 6 shows how the map and parcel database can be used to easily track this information.

Should ADLC choose to monitor and enforce the restrictive covenants and deed-based restrictions on ARCO’s behalf, the local government should request that ARCO provide information about all property conveyances in a GIS database similar to the Anaconda-Deer Lodge County parcel information system discussed here.

Map 6: GIS Database Demonstration
This map illustrates how the parcel map and tabular GIS data are linked together. The parcel highlighted in yellow is the East Anaconda Yards property. Note that both the parcel and the associated record in the table are highlighted in yellow. The tabular data indicate that the East Anaconda Yards property is owned by ADLC, zoned for light industrial uses, lies within the SPAOD / Anaconda Development Area, and was conveyed in 1994 with property use restrictions. This system would allow ADLC planning staff to identify all the use controls that apply to a particular property by simply highlighting a parcel on a map and reviewing the related data in an attribute table.

Key Considerations
One advantage of tracking multiple layers of regulatory information in one parcel database is that it allows an administrator to easily identify the controls that apply to a piece of property. However, it would be necessary for a local government administrator to manage and update the system regularly. The parcel database that was used as the framework for this map set was designed to be periodically updated by Montana’s Cadastral Mapping Program. In order for ADLC to maintain the most up to date records, an administrator would need to manage the process of obtaining new parcel information from the state program’s website and updating a database similar to this one with that new information.

In order to manage, track and administer land use and information through the GIS database effectively, planning staff would need to receive training in the use of Geographic Information System software.

Map 7: Anaconda Smelter Superfund Site Remedial Design Units
Map 7 was developed for a workshop with Anaconda-Deer Lodge County and EPA Officials in September 2005. The purpose of this resource is to delineate the different remedial components of the Anaconda Smelter Superfund Site. The legend identifies generalized remedial components, including Upland Areas, Lowland Areas, Waste Management Areas, the Anaconda Development Area, and the Old Works Area. Bulleted text in the key describes the remedial approach developed by ARCO and EPA Region 8 for each

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5 This map was created using a combination of parcel ownership information, a publicly available database obtained through the State of Montana’s Cadastral Mapping Program, and legal conveyance agreements provided by Anaconda-Deer Lodge County planning staff.
area. These site characteristics were compiled based on the best available information provided in the work plans for each remedial design unit. For more detailed information on the remedial design approach for these areas, see Table 1: Preliminary Analysis of Land Use Issues, and Table 2: Remedial Sequencing at the Anaconda Superfund Site.

Key Considerations
This map was created from existing paper maps, which were scanned and overlaid on a USGS topographic map of Anaconda-Deer Lodge County. GIS information for the remedial design units at the Anaconda Smelter Superfund site has been developed by ARCO. While it is outside the scope of this analysis to provide a GIS database with all existing spatial and attribute data on the Anaconda Smelter site, the GIS shape files and attribute tables for site boundaries and remedial design units would be useful for Anaconda-Deer Lodge County to have included in future GIS databases.

In addition to the remedial design units, the extent of existing contamination has also been developed in a GIS database. The precise locations of waste-in-place and waste management areas would also be critical components for a future Anaconda-Deer Lodge County GIS database.
<table>
<thead>
<tr>
<th>Remedia Design Unit</th>
<th>Superfund Considerations</th>
<th>Land Use Planning Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opportunity Ponds (8)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tailings Pond</td>
<td>Waste Repository:</td>
<td>Planning Area: Waste Management Overlay / East Valley Planning Area</td>
</tr>
<tr>
<td>Triangle Waste</td>
<td>• Opportunity Ponds receives contaminated media from remedial activities throughout the Anaconda Smelter Superfund Site.</td>
<td>Ownership: ARCO owned until 2012, at which point ADLC will assume ownership, operation and maintenance responsibilities.</td>
</tr>
<tr>
<td>South Lime Ditch</td>
<td>• Long term storage of mining wastes.</td>
<td>Access: Waste management areas require access for transportation of contaminated media.</td>
</tr>
<tr>
<td><strong>Remedial Issues:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Stabilize waste material</td>
<td>Reuse Considerations: Adjacent trail system to become part of larger greenway.</td>
</tr>
<tr>
<td></td>
<td>• Limit groundwater percolation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Contain surface water</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Close facility</td>
<td></td>
</tr>
<tr>
<td><strong>Institutional Controls:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Access restricted to operation &amp; maintenance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Adjacent areas are dedicated to greenway trail system – access restricted</td>
<td></td>
</tr>
<tr>
<td><strong>Smelter Hill Facilities (14)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste Repository:</td>
<td>Planning Area: Waste Management Overlay / Anaconda and Mill Creek Planning Areas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Smelter Hill has received contaminated media from removal and remedial actions.</td>
<td>Ownership: ARCO owned until 2012, at which point ADLC will assume ownership, operation and maintenance responsibilities.</td>
</tr>
<tr>
<td></td>
<td>• Soils throughout area are contaminated with heavy metals resulting from aerial fallout from smelter.</td>
<td>Reuse Considerations:</td>
</tr>
<tr>
<td></td>
<td><strong>Remedial Issues:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Stabilize waste material</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Limit groundwater percolation</td>
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<td></td>
<td>• Contain surface water</td>
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<tr>
<td></td>
<td>• Close facility</td>
<td></td>
</tr>
<tr>
<td><strong>Institutional Controls:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Access restricted to operation &amp; maintenance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Adjacent areas are dedicated to recreational use and mining heritage interpretive trail system – access restricted.</td>
<td></td>
</tr>
</tbody>
</table>
### Remedial Design Units

<table>
<thead>
<tr>
<th>Old Works (13)</th>
<th>Remedial Issues:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation of arsenic contaminated soils and replacement is ongoing.</td>
<td></td>
</tr>
<tr>
<td>Soil arsenic concentration remediated according to three land use designations: Residential – 250 ppm</td>
<td></td>
</tr>
<tr>
<td>Commercial/Industrial – 500 ppm</td>
<td></td>
</tr>
<tr>
<td>Open Space – 1000 ppm</td>
<td></td>
</tr>
</tbody>
</table>

**Institutional Controls:**
- Commercial & industrial properties may have residential use restrictions.
- DPS review and restrictions applicable to all properties.
- Dedicated developments are in place (e.g. Old Works trail system and golf course).

**Planning Area:** Smelter & Waste Management Overlay / Anaconda and East Valley Planning Areas

**Reuse Considerations:**
- Coordination is needed between ADLC development districts and the land use designations in the Old Works remedial design and IC work plan.
- Industrial Park is a priority area for new commercial and industrial development.

<table>
<thead>
<tr>
<th>Slag Piles (12)</th>
<th>Removal Considerations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Slag</td>
<td>100% or 50% excavation of slag.</td>
</tr>
<tr>
<td>Landfill Slag</td>
<td>Old Works Golf Course to retain 40,000 cubic yards.</td>
</tr>
<tr>
<td>Main Slag</td>
<td></td>
</tr>
</tbody>
</table>

**Institutional Controls:**
- Restrictive covenants
- DPS review and restrictions

**Planning Area:** Smelter and Waste Management Overlay / Anaconda Planning Areas.

**Reuse Considerations:**
- Potential for commercial or industrial reuse.
- Coordination needed between work plan and ADLC development designations.

<table>
<thead>
<tr>
<th>Anaconda Ponds (4)</th>
<th>Remedial Considerations: Currently designated as a waste management area.</th>
</tr>
</thead>
</table>

**Institutional Controls:**
- Access restricted to Operation & Maintenance.

**Planning Area:** Waste Management & Smelter Overlay / Anaconda Planning Area

**Reuse Considerations:**
- Future of Anaconda Ponds?

<table>
<thead>
<tr>
<th>Railroad Beds (5)</th>
<th>Remedial Considerations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>RARUS - active</td>
<td>Engineered covers proposed for all contaminated railroad bed material.</td>
</tr>
<tr>
<td>West Valley RR - inactive</td>
<td>Reconstruction of active RARUS line.</td>
</tr>
<tr>
<td></td>
<td>Rail removal and re-grading for inactive West Valley RR bed.</td>
</tr>
</tbody>
</table>

**Institutional Controls:**
- Private trespassing laws
- Restrict access to active railroad bed from adjacent residential areas with barrier.

**Reuse Considerations:**
- Future recreational reuse potential of West Valley railroad
- Coordination of remedial plans with railroad yard activities
<table>
<thead>
<tr>
<th>Remedial Design Units</th>
<th>Superfund Considerations</th>
<th>Land Use Planning Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stucky Ridge (1)</strong></td>
<td>Remedial Considerations:</td>
<td>Planning Area: Stucky Ridge RDU lies within both Anaconda &amp; Lost Creek Planning Areas</td>
</tr>
<tr>
<td></td>
<td>• Land reclamation techniques to reduce soil arsenic concentrations: tilling, pH adjustments &amp; liming.</td>
<td>Reuse Considerations: Anaconda Planning Area envisions a range of residential uses requiring clean up levels &lt; 250 ppm arsenic concentration. Lost Creek planning area calls for agricultural &amp; residential uses with limited utility extensions. Any new development will require municipal water &amp; sewer utility extensions. Steep slopes may prevent residential level remediation and restrict development options.</td>
</tr>
<tr>
<td></td>
<td>• Storm water &amp; erosion controls.</td>
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<tr>
<td></td>
<td><strong>Institutional Controls:</strong></td>
<td></td>
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<tr>
<td></td>
<td>• DPS restrictions,</td>
<td></td>
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<tr>
<td></td>
<td>• Community Protective Measures program</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Property owner info packages &amp; developer's package</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Mt. Haggin (3) &amp; Smelter Hill (15)</strong></th>
<th>Remedial Considerations:</th>
<th>Planning Area: Smelter &amp; Open Space Overlay / Mill Creek Planning Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Land reclamation techniques to reduce soil arsenic concentrations: tilling, pH adjustments &amp; liming.</td>
<td>Reuse Considerations: Steep slopes may prevent development and residential level remediation.</td>
</tr>
<tr>
<td></td>
<td>• Storm water &amp; erosion controls.</td>
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<td></td>
<td><strong>Institutional Controls:</strong></td>
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<tr>
<td></td>
<td>• Technically Impractical (TI) well zone</td>
<td></td>
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<tr>
<td></td>
<td>• DPS restrictions</td>
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</tbody>
</table>

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<thead>
<tr>
<th><strong>South Opportunity (6)</strong></th>
<th>Remedial Issues:</th>
<th>Planning Area: Smelter &amp; Waste Management Overlay / Mill Creek Planning Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Lowland and flood plain soil stabilization and land reclamation</td>
<td>Current Land Use: rural residential, agricultural and wild life management areas.</td>
</tr>
<tr>
<td></td>
<td>• Residential yard remediation</td>
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<td></td>
<td><strong>Institutional Controls:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• DPS restrictions</td>
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<td>Remedial Design Units</td>
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<td>Land Use Planning Implications</td>
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</tr>
<tr>
<td><strong>Fluvial Tailings (9)</strong></td>
<td><em>Remedial Issues:</em></td>
<td><em>Planning Area:</em> Open Space Overlay / Mill Creek, East Valley Planning Areas</td>
</tr>
<tr>
<td></td>
<td>• Lowland and flood plain soil stabilization and land reclamation</td>
<td><em>Reuse Considerations:</em> Recreational trail system, development envisioned for Yellow Ditch area</td>
</tr>
<tr>
<td></td>
<td><em>Institutional Controls:</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Technically Impractical (TI) well zone</td>
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<td></td>
<td>• Property owner info packages &amp; developer's package</td>
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</tr>
<tr>
<td><strong>Lost Creek (2)</strong></td>
<td><em>Remedial Issues:</em></td>
<td><em>Planning Area:</em> Open Space Overlay / Lost Creek Planning Area</td>
</tr>
<tr>
<td></td>
<td>• Lowland and flood plain soil stabilization and land reclamation</td>
<td><em>Current Land Use:</em> rural residential, agricultural and wildlife management areas</td>
</tr>
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<td></td>
<td>• Storm water and erosion controls</td>
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<td><em>Institutional Controls:</em></td>
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<tr>
<td>Actions</td>
<td>Description</td>
<td>Operable Unit / RDU</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Arbiter Non-time Critical Removal Action</td>
<td>Removed 275,000 cubic yards of arsenic and beryllium wastes from Arbiter Plant, deposited in Smelter Hill Repository.</td>
<td>Old Works / East Anaconda Development Area OU</td>
</tr>
<tr>
<td>Old Works Stabilization Removal Action</td>
<td>Riparian sediments in Red Sands area stabilized adjacent to Warm Springs Creek to contain surface water contamination.</td>
<td>Old Works / East Anaconda Development Area OU</td>
</tr>
<tr>
<td>Mill Creek Time Critical Removal Action</td>
<td>Action included: permanent relocation of residents (8 homes) from properties with significant arsenic deposition, stabilization of soils, consolidation of wastes and debris, fencing, and deed restrictions.</td>
<td>Old Works / East Anaconda Development Area OU</td>
</tr>
<tr>
<td>Actions</td>
<td>Description</td>
<td>Operable Unit / RDU</td>
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<tr>
<td>----------------------------------------------</td>
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</tr>
<tr>
<td><strong>Old Works East Anaconda Area Remedial Action</strong></td>
<td>Remedy selected in 1996 addressed smelter wastes deposited throughout the Old Works and East Anaconda areas, including: Red Sands Floodplain Wastes (Jig Tailings), Heap Roast Slag, Miscellaneous Waste Piles (including Waste Piles 1-8), Upper and Lower Works, Demolition Debris, Flue Debris, Railroad Beds, and Mixed Wastes. The major components of the remedy include constructing engineering covers and/or revegetation over waste materials in recreational and potential commercial/industrial areas exceeding arsenic levels of 1,000 parts per million (ppm), and covering or treating soils exceeding arsenic levels of 500 ppm in current commercial/industrial areas.</td>
<td>Old Works / East Anaconda Development Area OU</td>
</tr>
<tr>
<td><strong>Community Soils Remedial Action</strong></td>
<td>Remedy selected in 1996 for CS OU RA. The Community Soils OU addresses all residential and commercial/industrial soils throughout the Anaconda Smelter site. It includes the communities of Anaconda, Opportunity, Fairmont, Galen, and Warm Springs. Removal of contaminated soil, replacement with clean soil, and placement of a vegetative or other protective barrier, as well as treatment or other measures where removal proved infeasible. Remediation of future residential soils to be completed at the time of development, and Implementation of institutional controls.</td>
<td>Community Soils OU</td>
</tr>
<tr>
<td>Actions</td>
<td>Description</td>
<td>Operable Unit / RDU</td>
</tr>
<tr>
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<td>---------------------</td>
</tr>
<tr>
<td>Anaconda Regional Water, Waste &amp; Soils Remedial Action</td>
<td>ROD issued in 1998 for 15 remedial design units—construction is underway at several RDUs.</td>
<td>ARWW&amp;S OU 4</td>
</tr>
<tr>
<td><strong>Land Reclamation</strong></td>
<td>Soil covers &amp; treatments to reduce COC concentrations Revegetation</td>
<td></td>
</tr>
<tr>
<td><strong>Ground Water Remedial Actions</strong></td>
<td>Monitored Natural Attenuation Source Removal (surface water &amp; sediments) Groundwater Standard Waived</td>
<td></td>
</tr>
<tr>
<td><strong>Surface Water</strong></td>
<td>Soil reclamation to stabilize COCs Storm water controls to reduce COC migration via overland runoff Source removal Stream bank stabilization</td>
<td></td>
</tr>
<tr>
<td>Opportunity Ponds</td>
<td>Mine waste repository to receive contaminated fill, surface water, solid wastes from other removal and remedial actions throughout the site.</td>
<td>Opportunity Ponds (ARWW&amp;S OU - RDU #8)</td>
</tr>
<tr>
<td>Anaconda Ponds</td>
<td>Waste Management Area Mine waste repository has historically received contaminated wastes from throughout the site.</td>
<td>Anaconda Ponds (ARWW&amp;S OU - RDU #4) Waste Management Overlay</td>
</tr>
<tr>
<td>Smelter Hill Repository / Disturbed Area</td>
<td>Mine waste repository to receive contaminated fill, solid wastes from removal and remedial actions throughout the site.</td>
<td>ARWW&amp;S OU - RDU #14</td>
</tr>
</tbody>
</table>
Legend

Zoning Districts
- CBD (Central Business District)
- CBD / MSOD (Main Street Overlay District)
- HC (Highway Commercial)
- HDR (High Density Residential)
- HI (Heavy Industrial)
- IOD (Institutional Overlay District)
- LI (Light Industrial)
- LDR (Low Density Residential)
- MDR (Medium Density Residential)

Map 1: Anaconda Development Districts

Anaconda, MT
February, 2006
Legend
Superfund Overlay (SPAOD) Districts
- SPAOD / Agriculture Grazing Recreation
- SPAOD / Airport Light Industrial
- SPAOD / Anaconda Development Area
- SPAOD / Heavy Industrial
- SPAOD / Open Space
- SPAOD / Opportunity Ponds WMA
- SPAOD / Opportunity Rural Residential
- SPAOD / Smelter Hill WMA

Map 2: Superfund Planning Area Overlay District
Anaconda, MT
February, 2006
Legend
Zoning Districts
- CBD (Central Business District)
- CBD / MSOD (Main Street Overlay District)
- HC (Highway Commercial)
- HDR (High Density Residential)
- HI (Heavy Industrial)
- IOD (Institutional Overlay District)
- LDR (Low Density Residential)
- LI (Light Industrial)
- MDR (Medium Density Residential)
- SPAOD (Superfund Overlay)

Superfund Overlay (SPAOD)
- Agriculture Grazing Recreation
- Open Space
- Smelter Hill WMA
- Anaconda Development Area
- Overlaps areas within Zoning District: HC, HDR, MDR, and LI

Map 3: Anaconda Development Districts/ Superfund Planning Area Overlay District

Anaconda, MT
February, 2006
Map 5: ARCO-Conveyed Properties

Anaconda, MT
February, 2006

Legend

Formerly ARCO Owned Property

Restrictied Covenants - 1994 ARCO Conveyance Agreement

Unrestricted Covenants - 1986 - ARCO Transfer

Railroad

Roads
Map 6: Anaconda-Deer Lodge County Property Information GIS Database Tracking System Demonstration
Generalized Remedial & Land Use Considerations

Upland Areas
- Land Reclamation
- Well Restrictions
- Steep Slopes

Lowland Areas
- Land Reclamation
- Surface water & Sediment Remediation
- Rural Residential & Open Space

Waste Management Areas
- Mine Waste Storage
- Portions are Access Restricted
- Limited Recreational Uses
- Adjacent Residential Areas

Anaconda Development Area
- Soil contaminant remediation
- Commercial, Industrial and Residential Uses
- Priority Redevelopment Area

Old Works
- Old Works Golf Course
- Old Works Trail System
- Restricted to Recreational Uses