



Idaho Department of Environmental Quality
 Kellogg Bunker Hill Superfund Site Program Office
 1005 West McKinley Avenue
 Kellogg, Idaho 83837



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION 10 – Hanford/INL Project Office
 309 Bradley Boulevard, Suite 115
 Richland, Washington 99352

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MEMORANDUM

Bruce Schuld *Craig Cameron*

FROM: Bruce Schuld (IDEQ) and Craig Cameron (USEPA)

TO: Rob Hanson (IDEQ) and Bill Adams (EPA)

RE: Analysis of Remedial Actions and Recommended Risk Management Approaches for Public Unpaved Roads, Large and/or Flood-prone Properties, and Recreational Areas Covered by the OU 3 Record of Decision

General

The remedy options for human health were defined in the Feasibility Study and ROD. The Basin Human Health Risk Assessment (HHRA) prepared by IDHW and IDEQ under a Memorandum of Agreement with EPA in 1999 identified increased risk from residential and incremental recreational exposures. The intent of the Basin Property Remediation Program (BPRP) is to focus on the most sensitive population and remediate residential properties that pose an increased risk to lead exposure.

As defined by the Record of Decision (ROD), remedial actions can include sampling, barrier installation and contaminated soils removal on residential yards, street and road rights-of-way, commercial properties, common use areas, developed recreation sites, and dust suppression during work. This list is not all inclusive. In Operable Unit (OU) 3, contamination has been transported through the region by flooding, railroad spillage, or use of contaminated materials for fill or gravel cover. These activities resulted in a patchwork of contamination between geographic areas, within communities, and within individual properties. As a result, yard soil is not assumed to be representative of an entire property (as it was in OU 1) during sampling and remediation, so discrete areas (including driveways, parking areas, play areas, flower gardens, vegetable gardens, rights-of-way, and other areas) are sampled at the same time as the yard at each property. Remedial actions in OU 3 have been specific to each sampled area; discrete actions are applied, when necessary, remedial action occurs on select portions of each property.

It is important to understand the difference between the terms “parcel,” “property,” and “yard” in the context of the OU 3 cleanup. A “parcel” is defined as a piece of land owned by a person or entity that is assigned a 12 digit number and taxed by the assessor. A “property” is the portion of land that is sampled or remediated as a unit. It may or may not contain a dwelling, and may be residential, commercial, or a common use area (CUA). A property may consist of multiple

parcels owned by the same person or, alternatively, there may be multiple properties on one parcel (such as a trailer park). A “yard” is nomenclature that has been used in OU 1 and was typically used interchangeably with the term “residential property.” In OU 3, a yard typically refers to the maintained lawn area within a property. Due to size, varying elevations, and use, some properties contain multiple yards. These distinctions have been made as cleanup moved to the Basin because more discrete areas on properties were sampled and remediated in OU 3 than OU 1.

Table 12.1 in the ROD indicates the estimated number of residences in the Basin with lead concentrations in yard soil. It was estimated that there are 4,597 properties in the Basin and 30 percent have a yard soil lead concentration that exceeds 700 mg/kg, with 20 percent exceeding 1,000 mg/kg (requiring removal), for a total of 1,379 properties requiring remedial action (USEPA, 2002). This estimate was based on sampling results in the Basin from 1996 -1999, before the distinction in terminology described above was made. Cumulative soil results evaluated for the 2010 Five Year Review show 39 percent of “properties” sampled require remedial action in a “yard” (using the terminology described above). These results indicate a higher percentage of “yards” that require removal (30 percent versus an original estimate of 20 percent) and a slightly lower percentage of yard locations that require barrier enhancement (5 percent versus an original estimate of 10 percent).

The ROD estimate of properties requiring remedial action was based on yard areas only; it did not consider discrete areas. Therefore, the ROD underestimated the number of properties that would ultimately require remedial action. Based on data to-date, 90 percent of properties in the Basin require remedial action in at least one sampled area, as opposed to 30 percent of yards estimated in the ROD. This equates to 4,137 “properties” that require remedial action, assuming that there are 4,597 “properties” in the Basin.

Table 12.1-11 of the ROD indicates an estimated 107 yards needing to be remediated in the lower Basin at a cost of \$4,820,487 (present worth cost for 2002) for remedial work without recontamination potential. Therefore, the estimated cost for remediation of a lower Basin “yard” was about \$45,000 in 2002 dollars. That unit cost per yard inflated at three percent (3%) compounded to 2013 would be about \$60,500 per yard. Three percent inflation in construction costs is an attempt to estimate the true cost increases reflected over the first half of the decade versus the depressed cost increases during the recession period over the last half of the decade. It should be noted that the cost estimate for the preferred alternative in the ROD was partially based on the average cost for remediation of a “yard” in the lower Basin. The ROD does not define the size of a residential “yard.”

Subsection 12.1.1 of the ROD indicates the following: areas to be remediated at residential yards include sod areas, road shoulders, alleys, landscape and garden areas, unpaved driveways, play areas, storage areas, and garages with dirt floors.

Subsection 512.01c of the Basin ICP Rule exempts agricultural and undeveloped land from ICP requirements unless activities on those lands will track contamination off the lands. The Basin ICP requires that no new Planned Unit Development (PUD) or subdivision can be developed without contaminant management by the developer. The cost of remediation of a new subdivision would be the responsibility of the developer. This language was included in the Basin ICP because it was understood by the agencies that vacant lots in residential areas would

be remediated, but large undeveloped parcels would be the responsibility of the owners or developers.

The definition of a “Residential Property” in the Basin ICP is a property privately used as a residence, and/or undeveloped properties accessed by a maintained road or street and zoned for residential developments as of March 28, 2007. Residential and commercial properties are defined in the ICP without any indication of size. The following discussion documents the risk management decisions that the agencies have made to design remedial activities protective of human health on Public Unpaved Roads, Recreational Areas, and Large Residential Properties.

Discussion

Public Unpaved Roads

A remediation approach for the public unpaved roads in OU 3 was developed considering the OU 3 ROD, the Basin ICP requirements, and site-specific risk factors. Public unpaved roads were determined to be Type 2 Commercial Properties as defined in the Basin ICP and as noted for consideration under the ROD and ICP requirements. Type 2 Commercial Properties are those that are not used by predominantly sensitive populations. Under those requirements, contamination equal to or exceeding 1000 parts per million (ppm) lead or 100 ppm arsenic in the top six inches of existing road surfaces are considered for remediation. Additional factors, such as proximity to residential properties and dust migration are considered when determining which road segments will be remediated. All public road segments exceeding the soil action levels for lead or arsenic and serve residential properties (within 500 feet of any residence) or have extensive traffic (such as truck access to rock pit or logging operations, etc.) will be remediated under the BPRP. Potential for dust migration coupled with metals concentrations are considered on those segments. Some public unpaved road segments have not been included for remediation under the BPRP because they are being addressed under another program such as remedy protection.

The 500 foot criterion was selected in order to balance costs of cleanup with the need to manage risk. The basis for 500 feet comes from site-specific health risk analysis previously completed for the site. The analysis indicated soil lead concentrations from the individual property, the greater community, and those within a 200 foot radius significantly influence both house dust and blood lead levels (TerraGraphics 2000). The 200 foot “neighborhood” variable represents the geometric mean lead level of soils within a 200 foot radius of an individual living unit. The application of 500 feet to limit remediation, when needed, not only captures the soils within a 200 foot radius nearest homes, but also further minimizes risk by expanding that area to capture some of the “community” variable also shown to influence dust and blood lead levels.

More recent research suggests that resuspension of soil lead particles is a key source of exposure in large cities and contributes to the seasonal effects of blood lead levels (Filippelli and Laidlaw 2010, Zahran et al. 2013, Deocampo et al. 2012, Laidlaw and Filippelli 2008). However, many factors contribute to the resuspension of soil lead to air and dust, such as micro-level atmospheric conditions, particle size, traffic density, and amount of lead. Filippelli’s findings suggest that the direct road effect of lead resuspension can extend about 100 to 165 feet, depending on traffic volume and speed (pers. comm. 2012). This also supports the use of 500 feet as a conservative criterion for risk management decisions on unpaved roadways.

Acceptable barriers to contamination for Type 2 Commercial Properties include six inches of clean gravel meeting ICP requirements or a paved surface. Paving an unpaved road segment will be considered if required to ensure that the new surface constructed will serve as a proper barrier to contamination migration. Public unpaved roads under the jurisdiction of federal agencies and the Idaho Transportation Department are not included in this program and are the responsibility of those agencies.

Recreation Areas

Recreation areas in the Basin can be divided into two types of sites. Developed sites such as private or public campgrounds, with trailer pads, boat ramps, parks, trails and trail heads, etc., that are routinely maintained, and dispersed recreation areas where there are no developed amenities and users hunt, fish, boat and camp. Dispersed recreation sites fit into the definition of sites not addressed in the ROD and will not be remediated under the BPRP. The lower Basin is being investigated and the investigation is primarily focused on lead contaminated sediment transport and ecological exposure to lead in the flood plain. It is anticipated that additional cleanup actions will be selected to address those issues but will not be focusing on dispersed camp sites.

The ROD and Basin ICP require that the developed recreation sites be remediated if site soil concentrations of lead are equal to or exceed 700 ppm. Recreational areas with arsenic levels above 100 mg/kg will be prioritized for cleanup based on use. As identified in the Basin ICP, only developed recreation sites in existence on or before September 1, 2007, would be subject to remediation under the BPRP. Remediation in compliance with the ICP for sites developed after that date would be the responsibility of the developer, either a government agency or private developer. Federally owned sites are the responsibility of the federal land management agencies.

There is a high degree of uncertainty that commonly used BPRP prescriptions will have long-term effectiveness in remediating developed recreation sites in areas with the propensity to become flooded frequently and recontaminated. In order to optimize the effectiveness of remedial prescriptions, portions of the remedial design report will be modified to reflect a change in strategy and implementation of the BPRP on developed recreation sites. For instance, exposure to fugitive dust generated from unpaved roads, pathways and campsites remains a high concern at developed recreation sites. Generally speaking, many of these previously unpaved areas will now be paved to provide a durable surface from which contamination may be washed or otherwise removed and prevent fugitive dust propagation. Native riparian or wetland vegetative communities, lawns, open water and/or other attributes that function as barriers at the time of the assessment will be left in place. This relies on the property owner to continue to provide adequate maintenance of these areas to sustain their values as barriers to exposure or migration of contaminants. There is no intent for the Panhandle Health District ICP to inspect or require maintenance of these types of barriers.

Large Residential Properties (Yards)

OU 3 contains numerous different types of property configurations, including smaller city lots in some communities, suburban lots in others, complex terrain, and a variety of rural properties that differ in size and shape. In comparison, the majority of properties located in OU 1 are platted, city-sized lots, with a few larger outlying rural properties. Parcel size is not indicative of the

actual maintained size of a property, but it does illustrate the range of property types in OU 1, OU 2 and OU 3. While some geographic areas in OU 3, most noticeably in the upper Basin, have parcel sizes and property configurations similar to OU 1, the lower Basin parcel sizes are more similar to OU 2, and several OU 3 geographic areas have a greater range and larger average parcel size than OU 1. What constitutes a “yard” does not adversely affect the cost of the BPRP when work is being performed on small residential properties (yards) in developed communities where the property or yard size is small relative to properties in more rural areas.

Large parcels are typically rural and have unique use-specific areas, including multiple driveways, yards, gardens, etc., compared to city lots, which generally consist of a yard, a driveway, and possibly a few flower gardens or other use-specific areas. A number of sampled properties in OU 3 have been identified as requiring more than one acre of remediation. The current estimated unit cost for remediation in the BPRP of \$5 per square foot (includes all programmatic costs) for 2 acres on a large rural property would result in a total remediation cost of approximately \$436,000. This is about seven times the estimated cost of remediation identified in the ROD (inflating for 2013 dollars) or eight times the cost of remediation on a small residential property (yard) in developed communities.

It has been observed on large rural properties that for simplicity of maintenance, many residents maintain lawns, patios, garages and storage spaces on one (1) acre around the primary residence. For reference, Kootenai County only taxes a one acre parcel as residential property when a residence sits on acreage; the rest of the land is taxed as timber land or agricultural and not residential. It is reasonable to presume that remediation of 1 acre around a primary residence would abate the majority of risks from contaminated soil on a property. There will be the circumstances where residential property owners will use a portion of their outlying property for residential and recreational activities. However, some risks associated with those exposures outside that one acre area could be appropriately managed by an informed property owner.

DEQ, EPA and PHD routinely provide property owners with educational information about property maintenance and public health, such as good hygiene practices which can reduce post-remedial residual risks. Therefore, the BPRP will restrict remediation to residential use areas on one acre or less (USEPA 2003). In most cases, this is expected to be much of the used areas near the home and, in some cases, the used and maintained discrete areas further from the home may also constitute the one acre. The BPRP will also continue to provide public health information and guidance for property maintenance to consider when managing any residual risks.

An exception to the discussion above, however, is how to deal with unpaved roadways or long driveways on private property that provide access/egress to a residence. These unpaved roadways and driveways can contribute to fugitive dust emissions, resulting in dust loading of the home and particulate settling in remediated areas. These roadways and driveways should be treated and maintained as a primary source of fugitive dust even though they can become recontaminated with frequent flood events. Therefore, high traffic areas such as access and egress roads or long driveways, parking areas and unpaved floors of ancillary buildings should be sampled and, if needed, remediated regardless of whether they exist in or out of the one acre area around the residential buildings. If they exist beyond the one acre area near the home, the 500 feet limit used for public unpaved roadways will be considered in combination with lead and arsenic concentrations of the access road or driveway and may be used to limit remediation on the parcel if the potential for recontamination is low.

Generally speaking, residences on flood-prone properties will still qualify for some level of work under the BPRP. However, due to the high level of risk for recontamination of these properties, remediation will be done once and only once on these properties, and it will then fall to the owners to maintain all remedial installations on those properties. This will be explained to the property owner prior to sampling, and the property owner will be required to sign a statement to that effect at the time of remediation.

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