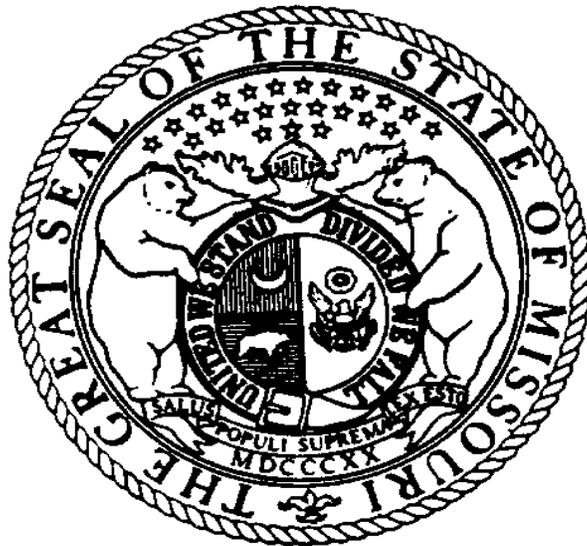


REPORT OF THE
MISSOURI LEAD INDUSTRY EMPLOYMENT,
ECONOMIC DEVELOPMENT AND
ENVIRONMENTAL REMEDIATION TASK FORCE



January 7, 2015

Prepared by:

Kayla Crider, Missouri Senate, Division of Research

January 7, 2015

The Honorable Tom Dempsey
The Honorable John Diehl
State Capitol
Jefferson City, Missouri 65101

Dear Mr. President and Mr. Speaker:

The Missouri Lead Industry Employment, Economic Development, and Environmental Remediation Task Force, acting pursuant to Senate Concurrent Resolution 19, gathered information from a variety of sources during the past few months. The Task Force examined the effects of a prompt environmental settlement giving rise to efficient and cost effective remediation, ways to promote the development of a clean lead industry, clean lead industry legislative proposals including rules and regulations necessary for implementation, and the economic potential of implementing clean lead industry policies. The Task Force heard testimony from The Doe Run Company, the Environmental Protection Agency, county executives, and private consultants during May and September 2014. Summaries of the testimony and supplemental information are included in this report.

There is widespread interest in the lead industry in this state. The Task Force expresses gratitude to The Doe Run Company, the Environmental Protection Agency, and to the individuals who provided vital information to the Task Force during the hearings.

In conclusion, the Task Force recommends continuing to study the lead industry in Missouri by establishing the Missouri Lead Industry Employment, Economic Development, and Environmental Remediation Task Force for the Ninety-eighth General Assembly, continuing to educate the public on the importance of lead, developing and promoting the lead industry while also serving to protect the public and safeguard the environment for future generations, focusing on directing resources to those areas that most impact blood lead levels in children, transferring authority of the oversight of cleanup of the Old Lead Belt from EPA to DNR, and researching the soil lead speciation of the Old Lead Belt.

The undersigned members of the Task Force are pleased to submit the attached report.

Senator Gary Romine, District 3
Chair

Representative Paul Wieland, District 112
Vice Chair

Senator Doug Libla, District 25

Representative Paul Fitzwater, District 144

Senator Gina Walsh, District 13

Representative TJ McKenna, District 114

Report

The Missouri Lead Industry Employment, Economic Development,
and Environmental Remediation Task Force

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Introduction and Background on the Lead Industry

The passage of Senate Concurrent Resolution 19 created the Missouri Lead Industry Employment, Economic Development, and Environmental Remediation Task Force. SCR 19 (2014) charged the Missouri Lead Industry Employment, Economic Development, and Environmental Remediation Task Force with examining the effects of a prompt environmental settlement giving rise to efficient and cost effective remediation, ways to promote the development of a clean lead industry, clean lead industry legislative proposals including rules and regulations necessary for implementation, and the economic potential of implementing clean lead industry policies. Further, SCR 19 (2014) allows the Missouri Lead Industry Employment, Economic Development, and Environmental Remediation Task Force to make recommendations in a report to the General Assembly. This report seeks to fulfill this obligation.

Lead and the Lead Industry in Missouri

The history of lead mining and the lead industry in Missouri is extensive. In the early 1700's, the French began exploring lead mining opportunities in Missouri.¹ In 1720, the first lead mine began operation in Madison County. Shortly thereafter, similar surface digging mines opened in Washington County and St. Francois County.²

The demand for lead only increased over time, especially with the events of the Civil War.³ In order to react to increased demand, the size of the lead mines increased drastically. From surface mines to mines that reached several hundred feet below ground, production continued to increase. However, by the early to mid-1940's, lead located in the Old Lead Belt region was being depleted and exploration for new resources had begun. In the 1960's, large deposits of lead minerals were discovered in the Viburnum Trend region, or what has come to be known as the New Lead Belt. Lead production ceased in the Old Lead Belt in the early 1970's. Currently, the Viburnum Trend's high levels of naturally occurring lead are responsible for all of Missouri's lead production.

Throughout Missouri's mining districts, large amounts of lead and other minerals are often found both at the surface and below ground including, but not limited to, copper, cadmium, zinc, nickel, cobalt, silver, and barite, even where mining operations have not taken place. Erosion has also caused lead minerals found in soil to wash sediments into rivers via tributaries. Today, large exposed rock bluffs often found in the Southeast Mining District serve as evidence that significant portions of rock formations and mineral deposits have naturally eroded away and deposited lead minerals downstream and within floodplains.

¹ Kleeschulte, 2013

² Kleeschulte, 2013

³ Kleeschulte, 2013

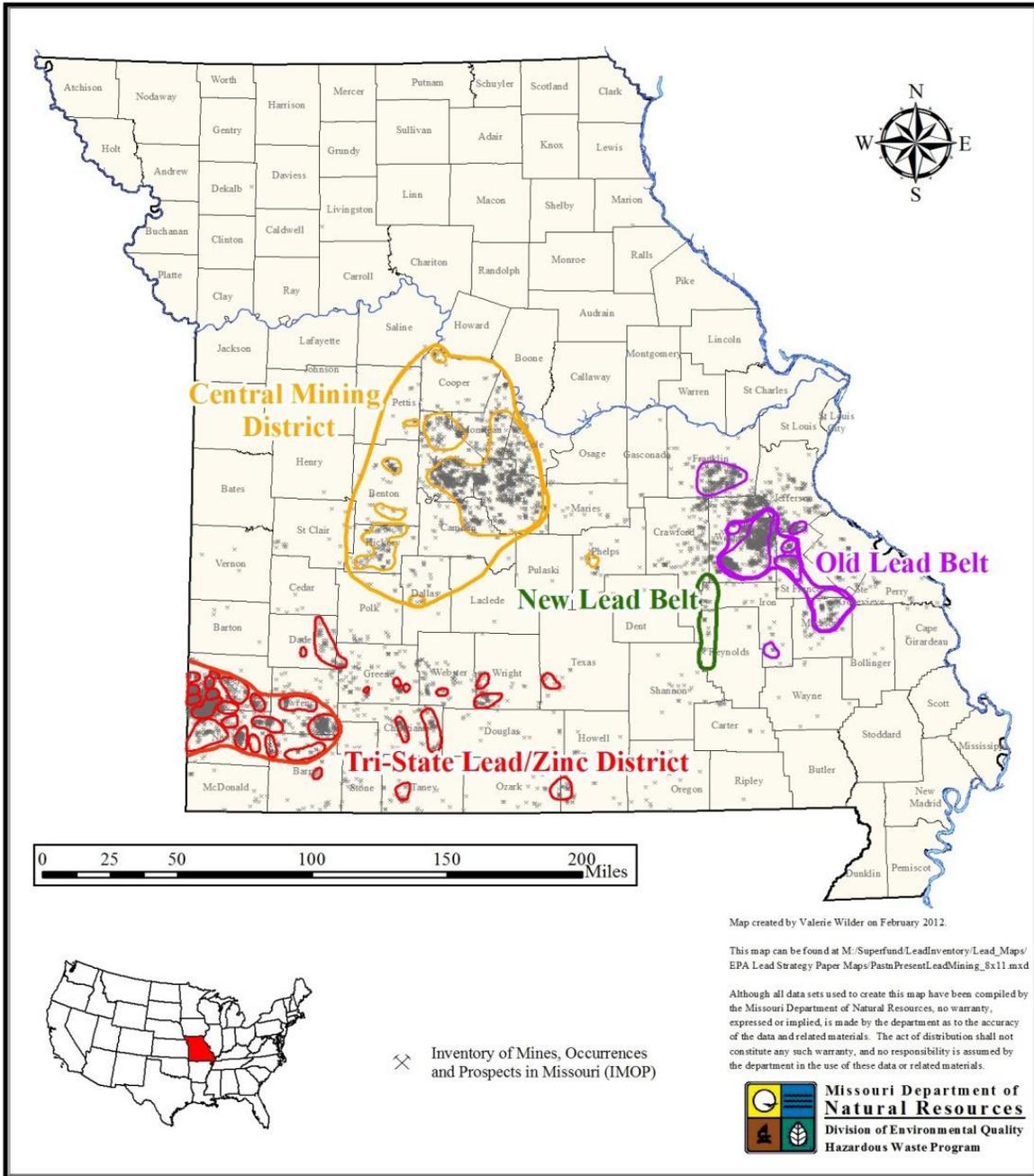
Mining Districts

The state of Missouri has three primary mining districts: the Southeast Missouri Lead District, the Tri-State District, and the Central District. Each district is located in a different region of the state and covers vastly different amounts of land. The Department of Natural Resources describes them as follows⁴:

1. Southeast Missouri Lead District – This includes the Old Lead Belt and the currently active Viburnum Trend (New Lead Belt). There are six active lead mines in the Viburnum Trend, all owned and operated by The Doe Run Company. The Washington County Barite Sub-District within the Old Lead Belt covered over 250 square miles, with the remaining Southeast Missouri Lead District encompassing over 400 square miles. The Southeast Missouri Lead District is home to the second largest lead mining district in the world which produced approximately 70% of the U.S. primary lead supply prior to the closure of the last U.S. primary lead smelter in Herculaneum, Missouri in December 2013.
2. Tri-State District – This includes approximately 14 counties in southwest Missouri, Cherokee County, Kansas and Ottawa County, Oklahoma. The Tri-State District encompasses over 2,000 square miles of land, with at least 700 of those square miles considered heavily mined areas.
3. Central District – This includes a 600 square mile area centered around the Lake of the Ozarks.

The map on the following page demonstrates the location of each mining district within Missouri.

⁴ Missouri Department of Natural Resources, 2014



Production and Economic Impact

For most of the late 19th and early 20th Centuries, Missouri was the global leader in lead production, and even today one of the largest, purest, and most important remaining lead deposit in the world is located in southeast Missouri. Well before Missouri was even a state, the region was widely recognized as a center of mining, milling and smelting of lead; the first recorded lead production occurring well before the Louisiana Purchase in 1803. Lead production has played an important role in the economic growth and development of Missouri. Missouri had the largest

and only active primary lead smelter in the United States (Herculaneum) until its closure in December 2013.

Historically, total lead production in Missouri is estimated at more than 17 million tons valued at nearly \$5 billion⁵ from the 1870's to 2002. For more than 80 years, Missouri has led all other states in lead production and has accounted for as much as 92% of total U.S. production.⁶ In year 2000 alone, Missouri produced more than 300,000 tons of lead estimated at over \$128 million.⁷ The legacy of this long and rich lead mining history has economically developed the state of Missouri by bringing settlers into this area, influencing the transportation infrastructure including railroads and highways, and creating an economic base for the state.

The high-grade lead mined in Missouri is also used in the manufacturing of several consumer products, including vehicle batteries and batteries used for electric backup power. Military and communication applications often use such lead. Lead is also used in environmental protection products such as nuclear disposal shields. Missouri's mineral resources and the associated lead industry have been vital to the region for 300 years and now has the ability to once again limit the country's dependence on foreign sources. Lead is arguably Missouri's most economically important mineral. Appropriately, galena, a natural form of lead ore, is Missouri's State Mineral.

The Future of the Lead Industry

Due to the long and rich tradition of lead mining in Missouri, and its added production and economic value, it is considered irreplaceable to the state's economy and culture. In Missouri, the lead industry has opportunity for growth and development due to the emergence of new mining technologies. However, the current cost of new mining and mineral processing technologies in the current economic and environmental climate often puts mining companies at financial risk. To this end, it is important to study the potential policies and regulations that govern the industry. With government regulation at both the state and the federal level, the lead mining industry continues to face challenges with compliance and remediation. Relating to the foregoing, this Task Force is concerned that regulatory bodies fail to: 1) Recognize the applicable sources of lead in the environment, or 2) Assist the population in the state that continues to remain at the greatest risk for incidence of elevated blood lead. Tens of millions of dollars have been spent on residential soil remediation in the Tri-States and Southeast Mining District, yet the rate of reported elevated blood lead levels in these regions mimic the average levels in the rest of the state. Nationally, blood lead levels continue to drop as older housing stock with lead-based paint is replaced with newer housing and lead is removed from consumer goods, such as from food cans and paint. Irrespective of these national trends and blood lead levels that are consistent with the rest of the state, regulatory authorities are currently proposing continued soil remediation in Jefferson, St. Francois and Washington counties that, if completed, will exceed \$100 million. Conversely, at current levels, less than a percent of this amount will be spent assisting with lead-based paint remediation in the urban areas of the state where, according to Missouri Department of Health and Human Services, the greatest number of children with elevated blood lead levels in the state reside.

⁵ United States Geological Survey, 2002

⁶ United States Geological Survey, 2002

⁷ United States Geological Survey, 2002

This Task Force encourages regulatory bodies to work cooperatively with industry and community leaders to ensure that current approaches being used to address lead remediation are appropriate for the actual risk and to revise policies as necessary to benefit the greatest number of impacted children.

The remainder of this report details the testimony taken by the Task Force relating to the lead industry, and the recommendations by Task Force members on how to improve the lead industry in Missouri.

Organizational Meeting
April 4, 2014

The Missouri Lead Industry Employment, Economic Development, and Environmental Remediation Task Force, acting pursuant to Senate Concurrent Resolution 19 (2014), held an organizational meeting in the Bingham Conference Room. The Task Force discussed sending a letter to the Environmental Protection Agency regarding the placement of numerous sites on the National Priorities List. See pages 9-11 for a copy of the letter.

SENATE MEMBERS

Senator Gary Romine, Chair
Senator Doug Libla
Senator Gina Walsh



Representative Membe

Representative Paul Wieland, Vice Cl
Representative Paul Fitzwater
Representative TJ McKenna

MISSOURI LEAD INDUSTRY EMPLOYMENT, ECONOMIC DEVELOPMENT, AND ENVIRONMENTAL REMEDATION TASK FORCE

Mr. Karl Brooks
Administrator, Region 7
Environmental Protection Agency
11201 Renner Blvd.
Lenexa KS 66219

April 17, 2014

Dear Mr. Brooks:

We, the undersigned members of the Missouri Lead Industry Employment, Economic Development and Environmental Remediation Task Force, respectfully request that the Federal Government, acting through the Environmental Protection Agency (EPA) and the Natural Resource Trustees (Trustees), Department of Interior and the Department of Agriculture, in conjunction with the Missouri Department of Natural Resources (MDNR), reconsider its approach to lead and other metals in the environment in Southeast Missouri. While we are genuinely interested in protecting the health of our constituents, the overly expansive site definitions and agency preference for wide-scale remediation has had and will continue to have negative impacts on our communities, our local economy and ultimately our constituents.

The EPA has placed numerous sites on the National Priorities List (NPL) in Southeast Missouri related to the historical mining activities in Jefferson, Washington, Madison and St. Francois counties. The site boundaries have been defined to virtually include all areas within these counties where lead is located, regardless of the source. We recognize that this approach may be a result of administrative simplicity; however, the identification of huge areas of this state as Superfund Sites on the NPL because of these elevated lead levels in soils with little to no focus on the source has caused undue concern and impeded economic development in communities in Southeast Missouri.

The EPA has proposed spending hundreds of millions of dollars to dig up thousands of residential yards that have elevated lead levels in the aforementioned counties for placement in landfills and repositories. The EPA is currently studying what to propose with respect to river sediments and floodplain soils and apparently is considering the destruction of thriving ecosystems through a program of dredging and excavation of the Big River and floodplains. Other remedial activities and claims for damages, although not clearly identified, appear to be contemplated in an area of more than 15,000 square miles encompassing all or part of 22 Missouri counties that has been identified as a single site by the Trustees. It is feared that the continued wide-sweeping efforts by the EPA and the Trustees to address lead that has been in the soils and streams of Southeast Missouri for hundreds, if not thousands, of years will only negatively impact our communities and economy further.



Additionally, it has come to our attention that the Federal Government, acting through the EPA and the Trustees, in conjunction with the MDNR, is looking for “someone” to address under the Superfund nearly every area where elevated lead levels exist in soils and sediments in Southeast Missouri and to potentially pay for any perceived harm to natural resources caused by that lead, again, regardless of the lead’s source.

The State of Missouri has a long, proud, mining history; a history the land supported well before statehood. Since the early 1700s, generations of mining families made their livelihoods off the mineralized soils of Southeast Missouri. Of the many mining companies that supported our local, rural economies, only one hard rock mining company focused mostly on the recovery of lead ore remains – The Doe Run Company. The Doe Run Company – successor to the St. Joseph Lead Company – has survived for 150 years. Over the last 20 years Doe Run has spent tens of millions of dollars addressing the impacts from mining in Missouri related to its and others historical operations. The continued survival of this important Missouri employer, that supports approximately 1,300 direct jobs and 6,000 indirect jobs in some of the poorest counties in the United States, is vital to the state.

The legacy resulting from having one of the richest deposits of lead ore in the world located within our great state is the naturally elevated lead levels in the mineralized soils and sediments of Southeast Missouri. Over the millennia, massive lead-bearing geologic formations weathered and eroded spreading lead throughout the area. Lead ore is still found right on the surface. In many areas, the naturally occurring lead levels have been exacerbated through decades of primitive surface mining by a multitude of companies or individuals and also from the use of leaded paints.

With The Doe Run Company being the “last man standing,” the agencies appear intent on burdening it with the legacy of, not only its own historical operations which essentially have been addressed through past remedial efforts of the company but also naturally occurring lead and mining operations throughout hundreds of years by thousands of mining interests with no connection to The Doe Run Company. This is especially egregious because the agencies appear intent on burdening this company with the costs associated with the impacts that decades of use of lead paint has had on lead levels in residential soils. What appears to us to be inequitable treatment of a significant local employer has been made possible through the combination of the expansively defined sites and the joint and several liability provisions within the Superfund. These claims and potential claims have forced The Doe Run Company to not only shelve plans for building in the State of Missouri a virtually emission free lead processing facility that could result in a sea-change in how lead is produced globally, but have put The Doe Run Company in a position where it is fighting for its very survival.

We strongly encourage the agencies to refocus their efforts on addressing what the Missouri Department of Health and Senior Services identified as the primary lead hazard to children today, deteriorated lead paint. According to the department’s 2012 report, the highest lead levels in children are found in the City of St. Louis, which suggests that the elevated lead levels were caused by lead paint, not mining. Utilizing a mere fraction of the hundreds of millions of dollars the EPA has proposed to spend placing soil in landfills instead on lead paint abatement efforts



could contribute greatly to reducing the number of children who have elevated blood lead levels in this state.

To the extent that the soil and sediment remedial efforts continue, we implore the agencies to utilize good science, rational thought, and maintain a focus on human health to wisely spend the moneys available. Further we ask that the agencies refine the site definitions and interact with the last remaining viable company in a fair and equitable manner.

Sincerely,

Senator Gary Romine—District 3, Chair

Representative Paul Wieland—District 122,
Vice Chair

Senator Doug Libla—District 25

Representative Paul Fitzwater—District 144

Senator Gina Walsh—District 13

Representative TJ McKenna—District 114

cc: Governor Jay Nixon
Attorney General Chris Koster
Director Sara Parker Pauley

The Missouri Lead Industry Employment, Economic Development,
and Environmental Remediation Task Force Hearing 1
May 8, 2014
Senate Committee Room 2

Summary of Testimony

1. Michael Ruby, Integral Consulting

Mr. Ruby testified that the Environmental Protection Agency is currently using a 400 parts per million (ppm) as the residential cleanup soil lead level. However, the “background,” or naturally occurring soil lead level, is much higher and significantly more variable. For example, in the Old Lead Belt background soil lead levels vary from 48 ppm to 10,000 ppm. Thus, cleanup is not always practical or feasible.

2. William Elzinga, AMEC Environment & Infrastructure, Inc.

Mr. Elzinga gave a presentation entitled “Natural Resource Damages Assessment Review of the Southeast Missouri Lead Mining District.” In the presentation, Mr. Elzinga and AMEC reviewed the Draft Southeast Missouri Ozarks Regional Restoration Plan and Environmental Assessment (also referred to as the Draft Restoration Plan), and they have also reviewed over 40 Southeast Missouri lead mining districts related to trustee natural resource damage assessment claims. Mr. Elzinga found that there is a lack of causation between injuries and release caused by a responsible party, inappropriate consideration of baselines, overestimation of the level of injury, and a failure to demonstrate loss of services. Such findings called Mr. Elzinga to question the basis to support natural resource damages claims. Mr. Elzinga provided three examples that support his findings: injury to aquatic ecosystems, injury to terrestrial ecosystems, and injury to birds and other wildlife. Mr. Elzinga concluded that the Restoration Plan has serious process flaws.

The Missouri Lead Industry Employment, Economic Development,
and Environmental Remediation Task Force Hearing 2
September 9, 2014
Senate Committee Room 1

Summary of Testimony

1. Chris Neaville, The Doe Run Company

Mr. Neaville stated that he is very familiar with the Old Lead Belt (OLB). He was born in Bonne Terre and lived in Herculaneum through high school. He holds a bachelor's degree in geological engineering from the Missouri University of Science and Technology and a master's degree in hydrology from the University of Arizona. He has 30 years of experience as an environmental professional with a specialty in site remediation. He is currently managing OLB Superfund remediation projects for The Doe Run Company (Doe Run). The following is a summary of Mr. Neaville's presentation.

The OLB has a long history of mining dating back to the early 1700's. Extensive surface mining took place for about 150 years in the multiple counties that make up the OLB before underground mining started in the 1870's in St. Francois County. The rock formations containing lead are exposed at land surface in the OLB and thus lead deposits were easy to find and exploit. Even today, it is common for people to find naturally-occurring lead minerals at their property when digging.

Surface mining created significant soil disturbance and the spreading of mining waste at the land surface. Large areas were stripped of vegetation causing erosion and discharge of lead into the tributaries of the Big River. Remnants of surface mines can be observed at places such as Doggets Diggings in St. Francois State Park and are identifiable in LiDAR imaging at sites throughout the OLB.

The diorama displayed at the Missouri Mines State Historic Site is a good depiction of early surface mining, and accurately depicts the bare land surface, shaker boxes, and washing of lead ore in the creek. The crude, open hearth smelting furnaces prevalent at the time caused the spreading of lead through direct emissions and by denuding of the land surface from cutting trees for fuel. Both lead and barite mining was very extensive in Washington and Jefferson Counties resulting in significant discharges of lead to the Big River in those counties.

After the Louisiana Purchase in 1803, the U.S. Government controlled much of the mining areas as designated on the maps presented. Based on historical records, maps, and LiDAR imaging, extensive areas (about 7 mi²) of surface mining pre-dated the underground mines. Much of this surface mining was in close proximity to the Big River and its tributaries. Closed chat piles and former tailings impoundments in St. Francois County are remnants of the underground mining that took place from the 1870's to 1970's. The lead recoveries in early surface mining were as poor as 30 percent with 70 percent being released to the environment. In contrast, underground mining from the late 1800's was much more efficient recovering most of the lead contained in the ore with the remainder contained in chat and

tailings and stored in controlled facilities. (Today's mining and milling processes capture approximately 97 percent of the mineral contained in ore.)

In recent years, Superfund Response Areas have been designated by EPA in multiple counties (Jefferson, Washington, St. Francois, Madison) where lead mining took place in the OLB region. The original NPL Superfund site was called the Big River Mine Tailings Site designated in 1992. This NPL listing was due to the tailings dam failure at Desloge caused by operation of a St. Francois County Landfill on the site after the mining site had been closed. Since that original designation, the Superfund activity has mushroomed to the scale of 53 square miles. Approximately \$100,000,000 has been spent by Doe Run to cover and remediate the former chat and tailings sites even though many other companies operated at these mines.

The St. Francois County Mined Area (SFCMA) Response Area as depicted in the Record of Decision (ROD) for OU-1 is the residential areas surrounding the mining sites in SFC. This site contains numerous individual sites which are geographically divisible. For this reason, Doe Run believes these sites should be considered individually and not be treated as one mega-site.

Previous clean-up work conducted by Doe Run near the former mine sites focused on grading, capping and covering chat and tailings piles as well as remediating residential soils within an EPA- designated distance from the piles. EPA studies document that dispersal of chat and tailings by wind would result in less than 250 ppm of lead in soil at the edges of these sites.

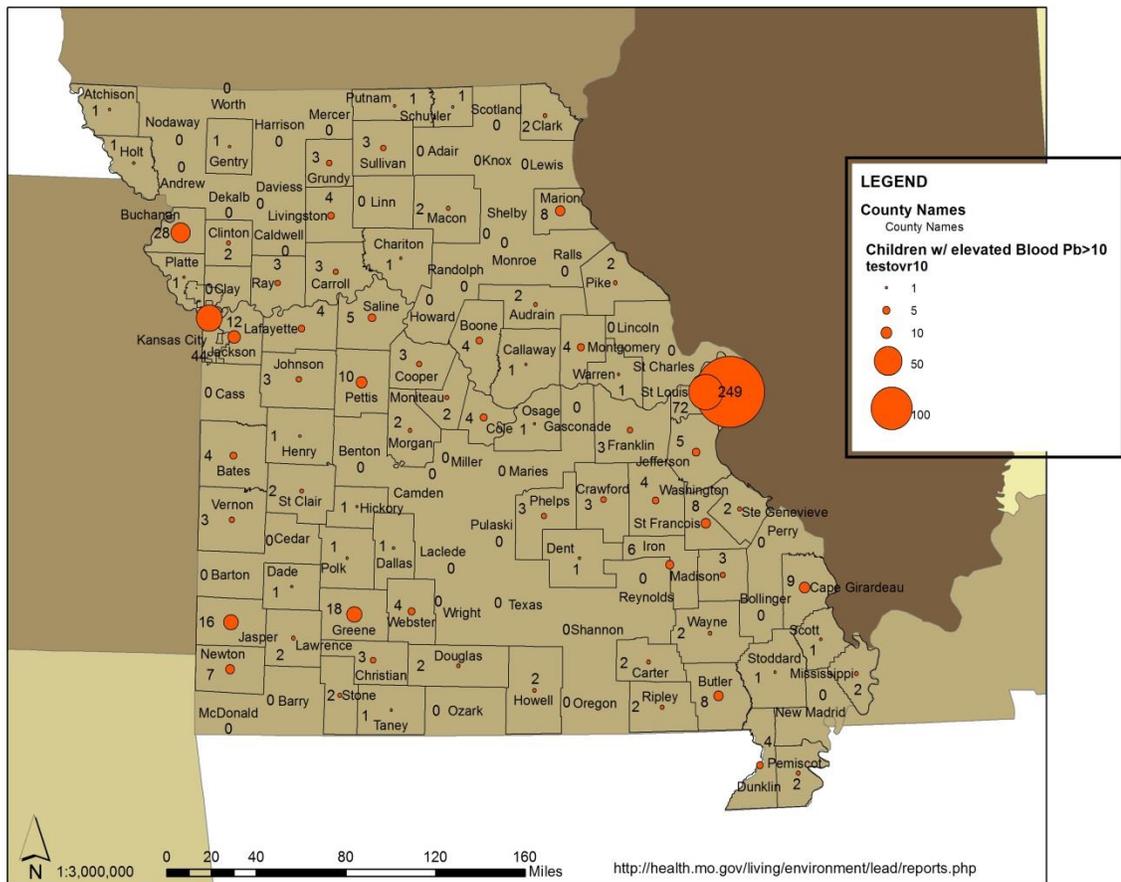
Today, densely populated residential areas have developed around the mining facilities and on top of the historic surface mines. Based on county GIS data, there are >8,000 residential parcels within the SFCMA Response Area.

Background samples were collected throughout OU-1 by the USGS, EPA, and Doe Run. Sample results exceed 400 ppm in about 30 percent of these samples. Since these samples are outside the area known to be impacted by blowing chat or tailings it can be concluded that it is very common to find soils exceeding the residential clean-up values, and that was more likely from spreading of lead from surface mining in the OLB than from windblown or waterborne chat and tailings.

There are other contributors to elevated lead content in soils within the Response Area. Many of the homes within the area are pre-1970 construction, and typically were covered with lead paint. Sampling of yards performed to date, confirms an obvious contribution of lead contamination to the soils from lead paint. There is also a high density of houses with lead paint that are located on top of historic surface mines. In addition, local cities, counties, and Missouri Department of Transportation were involved in transport and reuse of chat for construction and maintenance (ice control) of roads and homes. Today, local quarries continue to mine rock from the Bonne Terre dolomite (the host for galena) which is used throughout the region for roads, driveways, and fill for construction of homes.

Since the 1970's, there have been multiple initiatives to remove lead from consumer products, such as paint, gasoline, solder, and plumbing which has resulted in the dramatic decline of Elevated Blood Lead (EBL) levels nationwide. This trend has nothing to do with clean-up of residential soils in former mining areas. The charts presented show the steady decline over the past 40 years. In 1976, the average child in the United States had a blood lead level of approximately 16 $\mu\text{g}/\text{dL}$, suggesting a person who grew up in the United States in the 1970's was exposed to lead levels currently considered to be unacceptable. Missouri data from the last several decades shows that the occurrence of EBL's has continued a steady decline consistent with national trends. During this same period the regulatory reference levels of concern have also steadily dropped such that the most recent standards are lower than the national average in the 1960's.

The map below shows the numbers from 2013 of Missouri children tested who have blood lead levels above 10 $\mu\text{g}/\text{dL}$. Notice that the St. Louis metro area has greater numbers of children with EBL's than all of the other counties combined. Since there has never been lead mining in St. Louis, this contamination is obviously from lead paint. Kansas City is the second highest for the same reason, and the other leading counties are presumably the same lead paint issue. In contrast, St. Francois County was 10th with 8 children $>10 \mu\text{g}/\text{dL}$ even though EPA claims that 53 square miles are contaminated.



2. Kenneth Waller, Jefferson County Executive
Marvin Wright, Washington County Presiding Commissioner
Michael Alesandrini, Jefferson, St. Francois, and Washington County URS Report

Mr. Waller, Mr. Wright, and Mr. Alesandrini presented the Big River Watershed Master Plan. They stated that the Master Plan was initially a pilot project and that the report is merely informative and intentionally did not “have teeth.”

3. Jerry Pyatt, President and CEO, The Doe Run Company

Missouri is home to one of the world’s largest and purest lead deposits, which up until the closure of the Herculaneum primary lead smelter in December 2013, has met nearly all the U.S. demand for lead from the 1700’s on. As President and CEO of one of the world’s largest lead producers, The Doe Run Company, I oversee a company that operates six mines, four mills, one of the world’s largest lead recycling centers and approximately 1400 employees in Missouri, as well as a lead fabrication subsidiary in Arizona and lead oxide plant in Washington. Our Missouri economic impact is more than 1 billion dollars annually and we support Missouri vendors with more than \$205 million per year.

Lead is a strategic metal serving a variety of industries including automotive, telecommunications, military, nuclear, petroleum and renewable energy industries, information technology and the medical industries. The predominant use of lead is in batteries. These lead-based batteries are essential for delivering power to society and are by far the dominant motive technology.

More than 1 billion vehicles worldwide rely on lead-based batteries, while 90% of batteries now used in industrial applications, such as critical back-up power in hospitals and telecommunications, are lead-based. Both these applications are projected to grow significantly as developing countries expand automotive use and all countries consider renewable energy either as a way to reduce carbon emissions or as a power supply for geographies better suited for wind or solar power.

By 2020, it is projected that 25% of the global battery-based grid storage market and 37 million start-stop micro-hybrid vehicles on the road will use advanced lead batteries. The availability, recyclability, performance and low cost of lead-based batteries versus other battery chemistries will provide a lower threshold for adoption for hybrid vehicles. This start-stop micro hybrid vehicle approach equates to a reduction of 25 billion kg CO² equivalent⁸. With a recycle rate of more than 98%, lead batteries are the most highly-recycled consumer product, making them a sustainable source of energy storage.

Until recently the full life-cycle of lead production (mining, processing, primary lead metal production, manufacturing of finished products and recycling for future production) took place in Missouri. Today with the closure of the last U.S. primary smelter, located in Herculaneum Missouri, the U.S. now exports its lead concentrates for smelting and manufacturing in other countries, predominantly China and Europe. China currently smelts

⁸ Andy Bush, Batteries International, ELBC Show Guide, Summer 2014, p. 13.

the majority of the world's primary lead. Exports of lead from China are nearly *exclusively finished products*, such as batteries. China's lead metal demand continues to grow, year after year, and will be primarily used to supply the infrastructure of its own society.

Recycled lead (e.g. secondary lead metal) continues to be produced in the U.S., but shortages of lead metal will occur in the future if primary lead metal is not available to replenish the supply and supplement expansion.

For U.S. based battery manufacturers who depend on primary lead, this requires importing primary lead metal and alloys to meet their metal needs. It also means that the majority of the primary lead metal produced will go into finished products manufactured elsewhere, providing the full economic value to the country of export. This puts U.S. manufacturers at a disadvantage.

We contend this is a better approach.

Doe Run has invested tens of millions of dollars and more than 350,000 man hours into a new hydrometallurgy lead metal production technology that will revolutionize the global lead industry as we know it.

Announced in 2010, this process uses wet chemical and electrowinning processes, rather than the traditional high-temperature smelting process, to produce high-quality primary lead. The hydrometallurgy technology virtually eliminates lead and sulphur dioxide emissions.

The first country to achieve near-zero emissions lead production will enjoy a tremendous global advantage. If Doe Run can introduce the first commercial plant utilizing its proprietary technology, the company can retain its first-to-market advantage and make the U.S. a net exporter of proprietary processing technologies, supporting both domestic jobs in Missouri and a cleaner, and less energy-intensive global industry.

The greatest obstacle to building a commercial plant in Missouri is the uncertainty that surrounds Doe Run as a company and regulatory uncertainty for the industry. Mining is increasingly costly as the company searches farther and deeper for mineral resources, while adhering to standards that in some cases require water releases to streams at levels that are *cleaner* than drinking water standards. In the last three years, Doe Run has spent \$180 million on environmental expenditures (capital, operating and remediation).

We all want clean air, water and soil, however, today's regulatory regime has put the country on an unsustainable path, dependent on foreign nations for jobs, goods and resources. Furthermore, oftentimes these policies are advanced without the benefit of the best science.

The lead industry grew up in the U.S. because the natural resources are here. We view our organization not simply as a mining and metals organization, but as a technology company. Our employees are committed to the safe, sustainable extraction of minerals and production of metals. With our leap-frog, state-of-the-art lead production technology, we have the

ability to transform the lead industry and ensure that one of our nation's critical minerals can continue to be produced domestically.

4. Rex Eugene Gunn, U.S. EPA, Region 7

Mr. Gunn gave a presentation entitled "Briefing SEMO Superfund Activities." In the presentation, Mr. Gunn offered a brief background regarding lead and southeast Missouri lead mining. Mr. Gunn contended that lead poisoning is the #1 environmental health hazard facing American children today. He pointed out that lead exposure can come from many sources including lead-based paint, leaded gasoline emissions, lead metal production, and contaminated soil and dust. Mr. Gunn articulated that the Environmental Protection Agency's (EPA) authority to address sites contaminated with lead due to historic lead mining is under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Further, investigations and cleanup are being conducted under Remedial Authorities for sites listed on the EPA's National Priorities List. Residential soil lead cleanup levels are generally 400 parts per million.

Mr. Gunn addressed each of the 5 topics in the letter sent from the Task Force on April 17, 2014. Mr. Gunn addressed the basis and public decision making process that was followed for defining huge areas of Missouri as National Priority List Superfund Sites, the basis, status and scope of remedial decisions at various Missouri mining superfund sites, the upcoming opportunities to participate in the EPA's public decision making process for Superfund Sites in Missouri, EPA's strategies to avoid addressing soils containing naturally occurring lead, and EPA's policies and strategies with regard to properties contaminated by lead paint. First, in addressing the basis and public decision making process that was followed for defining huge areas of Missouri as National Priority List Superfund Sites, Mr. Gunn articulated that the Comprehensive Environmental Response, Compensation, and Liability Act allows the EPA to respond to "any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located." Mr. Gunn stated that the Big River Mine Tailing Site was listed on the National Priority List based on two observed releases of lead contaminated material from the Desloge tailings pile. The decision to expand the site to include all of the waste piles was recommended in the 1995 Initial Remedial Investigation Report and used in the 1997 Administrative Order on Consent for the development of the 2006 Focused Remedial Investigation. Also, the EPA conducted a Big River Mine Tailings Superfund Site Exposure Study in 1997 and found that the mean yard soil, drip line soil, and play area soil were all elevated in the St. Francois County study area. Then, similar approaches were used in Jasper County, Newton County, and Cherokee County sites.

Second, Mr. Gunn addressed the basis, status and scope of remedial decisions at various Missouri mining superfund sites. Mr. Gunn stated that 6 major mine waste piles have been carved out as removal actions to stop ongoing releases of mine waste. Mine waste piles are largely finished everywhere except Federal which should finish next year. The Doe Run and Hayden Creek piles are yet to be scheduled. In regard to the Big River/St. Francois County Site, the record of decision for residential properties in 2011 included public outreach. The scope is approximately 400 properties where mid-yard sampling yields soil lead levels greater than 400ppm. The EPA has performed over 400 additional time-critical removal

actions at residential properties since 2011, but river sediment and riverbank soil investigation and feasibility work is still ongoing. Decision making could be delayed additional years to receive treatability study results. In regard to the Washington County Site placed on the National Priorities List in 2008, approximately 300 residential properties have been addressed. The record of decision for drinking water, mine waste and sediments will follow. In regard to the Madison County Site, there was an interim record of decision for residential properties in 2006, and a final record of decision for residential properties this year.

Third, Mr. Gunn addressed the upcoming opportunities to participate in the EPA's public decision making process for Superfund Sites in Missouri. He stated that the Big River/St. Francois County Site has a record of decision scheduled for 2016 for river and floodplain sediments but could be delayed. Further, the EPA is required to seek public comment on the EPA's plan. The Washington County Site record of decision for residential cleanup is scheduled for 2015 or 2016. The Southwest Jefferson County record of decision is scheduled for 2015, and the Madison County Little St. Francois River Watershed Master Planning process is set to begin in 2015.

Fourth, Mr. Gunn addressed the EPA's strategies to avoid addressing soils containing naturally occurring lead. He stated that the EPA will not intentionally address naturally occurring lead ores in their undisturbed or natural state or altered solely through natural processes, and that contractors are instructed to stop digging when apparent natural media is encountered.

Fifth and finally, Mr. Gunn addressed EPA's policies and strategies with regard to properties contaminated by lead paint. Mr. Gunn articulated that the EPA has performed soil lead speciation and bioaccessibility measurements at most of the southeast Missouri sites, and that neither lead-based paint nor gasoline appear to be significant contributors to the site. Further, lead species at the Big River/St. Francois County Site indicated residential yards have lead forms common to the tailings piles.

Mr. Gunn also stated that the Missouri lead strategy involves a multi-agency approach including interested local, state, and federal partners including the Missouri Department of Natural Resources. The strategy also includes ensuring continued pace of investigation and cleanup to address human health and ecological impacts, and to continue to educate stakeholders about Missouri lead issues.

Recommendations

After review and consideration of the testimony presented, the Missouri Lead Industry Employment, Economic Development, and Environmental Remediation Task Force recommends the following:

1. Continuing to study the effects of a prompt and equitable resolution of environmental concerns arising primarily out of historical mining operations giving rise to efficient and cost effective remediation and restoration, ways to promote the development of a clean lead industry, clean lead industry legislative proposals including rules and regulations necessary for implementation, and the economic potential of implementing clean lead industry policies by establishing the Missouri Lead Industry Employment, Economic Development, and Environmental Remediation Task Force for the Ninety-eighth General Assembly.
2. Continuing to educate the public on the importance of lead, that it is a naturally occurring mineral, and the key to economic development in this state.
3. Encouraging the development and promotion of the lead industry, while also serving to protect the public and safeguard the environment for future generations.
4. Focusing on directing resources to those areas that most impact blood lead levels in children, mainly urban areas where older housing stock utilizing lead paint contributes to the highest incidents of elevated blood lead levels in the state.
5. Transferring authority of the oversight of cleanup of the Old Lead Belt from the U.S. Environmental Protection Agency Superfund Program to the Missouri Department of Natural Resources in order to eliminate the associated stigma and negative economic impact associated with National Priorities List Superfund sites.
6. Researching the soil lead speciation of the Old Lead Belt.