Assessment of Reserve Silica's Proposed Mining Site Conversion Demonstration Project

In Response to Proposals Distributed by Reserve Silica dated April 6, 2016 and May 1, 2016

Prepared by Michael & Donna Brathovde
for the Friends of Rock Creek Valley
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1.1 Executive Summary: Response to Reserve Silica Proposal

Reserve Silica's request to upzone their Ravensdale property to a Rural Residential land use, rather than revert to the Forestry designation current code would dictate, is based on a grossly erroneous assertion that to reclaim the majority of the property for forestry use would require "*significant and impractical investment*", and that this property does not satisfy the definition of '*forest land of long-term commercial significance*' based on either GMA or King County definitions. Our analysis, based on data and forestry reclamation practices recommended by Reserve's consultants, indicates that the costs to reclaim ~70% of the property for forest use would run on the order of $70,000; and the NET value of harvesting the existing 73 acres of mature Douglas-fir timber on the property, including replanting following harvest, should yield something near $400,000. So the assertion of an 'impractical' forest reclamation cost is totally incorrect. To put these forestry costs and revenues into perspective, our estimate of the net value to Reserve if their property were to be upzoned to RA-10 and they are approved to put in a 72-unit clustered 'rural community', is on the order of $1,700,000. Clearly, the driving force behind their push to upzone to rural residential is the desire to capture this residential-lot sale windfall, NOT to avoid 'impractical' forestry reclamation costs as they contend.

Reserve's proposal also fails to mention that the WA Department of Ecology did a Site Hazard Assessment in January 2016, and classified the site as a Class 1 (highest priority) MTCA toxic waste clean-up site, with a Human Health Risk rating of 4.4 (on a 1 – 5 scale, where 5 is extreme risk). These ratings are based on documented contamination of soil, surface and ground water from ~350,000 tons of hazardous Cement Kiln Dust (CKD) that was dumped in unlined pits on the property from 1979 – 1989. Though these pits have been capped since ~2003, all efforts to date to contain the contamination of surface and groundwater leaching from the site over the past fourteen years have failed, and contaminated waters, up to 30X MTCA Cleanup Levels (CUL) for arsenic, and 2X MTCA CUL for lead, with pH levels up to 13.02 (classifying the water as an RCRA 'corrosive waste', which is capable of causing significant burns on contact with humans or animals) is now beyond all interception and monitoring facilities, and has migrated off-site, over 800' from the closest CKD disposal area. And this highly contaminated ground and surface water is now less than 800' from Ravensdale Lake and Ravensdale Creek, with both the Kent Springs and Covington Soos Creek well fields downgradient from this point.

DOE Water Quality personnel believe this as yet uncontrolled ground and surface water would represent a significant human health hazard risk to nearby residents; and that the ~10 million gallons/year of incremental groundwater from septic systems for a 72-unit development, sourced with public water from off-site, could substantially exacerbate the ongoing efforts to try to control the CKD contamination. In addition, there are other toxins commonly associated with CKD that have not been tested for; and there is considerable evidence that other areas of the property may well contain other contaminates, for which no testing has been done.

The proposal also does NOT meet ANY of the five criteria specified in Policy I-203 (2012 KCCP) to qualify as a mining site conversion Demonstration Project. Furthermore, as proposed, the project would violate

at least 20 existing, long-standing County Policies, resulting in a 72-unit 'rural community' island, 1.4 miles outside the Urban Growth Boundary, totally surrounded by over 3,500 acres of FPD, Natural Area and Open Space lands which allow NO residential development whatsoever. The nearest public water supply needed to service this development is ~ 1.5 miles distant.

The Development Agreement; Conservation Easement; and Covenants, Conditions and Restrictions proposed by Reserve Silica are collectively structured to shift responsibility and liability from Reserve to a future Homeowner Association and to King County, while retaining Reserve's right to extract additional value from the property through future timber harvest and residential lot sales.

In summary, this site is <u>NOT</u> suitable for residential development. To approve such a use would expose King County to a substantial risk of future litigation from property residents and others. And contrary to Reserve claims, the majority of the property <u>IS</u> suitable for reclamation for forestry use, at very reasonable costs. As such, the Council should reject Reserve Silica's Demonstration Project proposal, revert the designated Land Use of the property to Forest and the zoning to Forestry and retain the property within the FPD; work with Reserve to develop a final reclamation plan that will reestablish viable forests on the majority of this property; and take steps to ensure Reserve follows through on these reclamation obligations.

Furthermore, Reserve's request to retain Policy I-203 in the 2016 KCCP should be rejected and the property returned to a Forest zoning in accordance with County codes; and the mining site conversion demonstration project provision should be dropped from the KCCP as recommended by the KC Executive. Not only is the Reserve site unsuitable for residential development, but Reserve Silica has had ample time to submit a proposal – and still has the opportunity to do so – yet has failed to take action despite making comments for more than a year now that submission was imminent. And given the numerous long-term health and environmental concerns associated with this property that are yet to be fully assessed and resolved, any extension of the I-203 policy would only serve to create a state of limbo during which it is likely little more will be done to complete reclamation and restoration of the property to its pre-mining state.

Additional background, with full references, on the key points above can be found in the detailed analyses accompanying this summary.

1.2 Questions and Short Answers

Reserve's proposal for a mining site conversion Demonstration Project raises a number of questions, most of which are poorly addressed, if at all, in Reserve's material. Each of these questions are discussed in detail in the body of this report, along with the background for the answers presented here. The following is a brief synopsis of the question, and the short answer. For more specifics, please refer to the section of this report noted for each question.

Is reclamation of the property for forestry "impractical" as Reserve claims? (Sections 2.1-2.4)

No. Estimated costs for reclaiming 70% of the property to where it can support commercial forestry is ~$70,000. And the likely net income available to Reserve to help fund this cost, from harvest of existing Douglas-fir plantation on the property is ~$400,000.

Hasn't the property always been primarily a mining site? (Section 2.5)

No. The vast majority of the property has been managed for forestry from the 1890s until the mid-1980s. While mining has occurred on the property for 65 years, it has only involved a small portion of the property, <10% until the 1970s, and topping out at 35% of the property at the close of mining in 2007.

Is the proposal compatible with surrounding land uses and supported by adjacent property owners? (Section 2.6)

No. The property is totally surrounded by designated Natural Area and Open Space lands, and Forest Production District lands; none of which will ever support houses. As such, the proposed "rural community" is incompatible with surrounding land uses. The only adjacent property owner who Reserve claims to support the current 72-unit development is Baja Properties, whose ownership encompasses just 13% of Reserve's perimeter.

Doesn't reclamation for forestry conflict with the 2012 IFC and UW study conclusions? (Section 2.7)

No. The key conclusion from the IFC study was that an industrial timberlands owner would likely not be interested in purchasing this property in whole to reclaim it for forest production. The UW study agreed. Now that filling the huge mine pits is nearing completion, the incremental costs to finish reclaiming the site for commercial forestry is pretty minimal. While an industrial timberlands owner would likely still not be interested, there are viable forestland buyers for the property if sold in 80+ acre blocks.

Does this property meet GMA and King County criteria for "forestland of long-term commercial significance"? (Section 2.8)

Yes. The UW study concluded in 2012 that the property would likely not meet criteria for "forestland of long-term commercial significance". With the reclamation now proposed by Reserve, and with the changes in ownership of surrounding properties since 2012, this property would fully satisfy both GMA and King County definitions.

Why is Reserve promoting conversion to Rural Residential development? (Section 2.9)

While Reserve is claiming their upzone request is because of "impractical investment" required to reclaim the site for forestry, we've demonstrated that these costs are minimal. What's likely driving the upzone request is the potential to capture a windfall by being able to sell residential lots, which we estimate would be worth an additional $1,700,000 to Reserve - above the value of reclaiming the site for forestry.

Who would buy these lands if the upzone was denied and the property was reclaimed for forestry? (Section 2.10)

While a single industrial timberlands owner is unlikely to be interested in this property, even after forestry reclamation, there is a very viable market for this forestland property if sold in 80+ acre blocks.

What is cement kiln dust (CKD), and why is it an issue on this property? (Sections 3.2-3.3)

CKD is a highly toxic waste product from the production of cement. 350,000 tons of CKD was dumped in unlined pits on the property in the 1980s. Though the pits have been capped, the CKD has contaminated the soil, surface and groundwater on the site with extremely caustic leachate and heavy metals, especially arsenic and lead. While efforts to control the contamination have been ongoing for fourteen years now, the contamination continues, and has now migrated off-site, and may pose a threat to public waters of the State in the near future.

Has the site been adequately evaluated for toxins and other human or environmental risks? (Section 3.4)

No. While Dept. of Ecology is monitoring the CKD pits and the contaminated remediation area for pH, arsenic, lead, and magnesium, there are other highly carcinogenic toxins commonly associated with CKD (dioxins, furans) that have not been tested for. In addition, there is substantial evidence for numerous other sources of contamination from almost 50 years of undocumented dumping on this site; for which no testing has been done.

Besides CKD, what other contaminants and risks might be expected on the property? (Sections 3.5-3.6)

There are indications the following contaminants may well exist on this site: ASARCO slag road ballast and gravel, petroleum-based contaminants, asbestos, carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and heavy metals associated with coal tailings, hazardous waste "fertilizers" and "liming agents." Portions of the site are also identified as Coal Mine Hazard, from the coal mine tunnels and workings from the 1920s – 1940s.

What are the environmental risks and human health hazards on the site? (Section 3.7)

DOE classified this site as a Class 1 (highest priority) MTCA toxic cleanup site in January 2016, based on the uncontrolled CKD contamination. Their evaluation rated the Human Health Risk at 4.4 on a 1-5 scale, where 5 is extreme risk to human health. Arsenic levels in surface waters are

up to 30X MTCA cleanup levels. Human or animal contact with contaminated soil or surface water can cause severe burns. DOE also views that the additional groundwater from 72 houses served by off-site public water and on-site septic systems could exacerbate the ongoing problems with trying to control the CKD contamination and migration.

Does this proposal meet the requirements for a mining site conversion Demonstration Project under I-203? (Section 4.1)

No. I-203 specifies five criteria a project must meet to qualify as a mining site conversion Demonstration Project. The current proposal does not fulfill any of these five criteria.

Is this proposal consistent with King County policy and goals? (Section 4.2)

No. This proposal violates at least 20 separate, long-standing County Policies, as well as the Greater Maple Valley/Cedar River CSA sub-plan.

Would approval of this proposal set a precedent for other landowners to follow suit? (Section 4.3)

Undoubtedly. Seven other known mining sites would likely apply for upzone if Reserve's proposal is approved. Plus, there are numerous nonconforming FPD parcel owners in the area who would also likely petition for upzone under this precedent. This could represent a major detriment to preserving King County's precious Natural Resource lands.

What other major issues are associated with this proposal? (Sections 5.1-5.4)

The structure of this proposal would shift responsibility and liability from Reserve to a future Homeowners Association and to King County, while retaining Reserve's ability to extract additional value from the property. The proposal puts the management responsibility (and funding?) for the CKD Hazardous Waste administration and for the forest reclamation on the HOA, which is entirely inappropriate. The recreational opportunities Reserve touts in this proposal, if enacted, would accrue only to the residents, as the public will be provided no right of access to the property. Finally, there is extensive opposition within the community to this proposal, to Rural-to-Rural TDR transfers, and to Demonstration Projects in general.

Just who is Reserve Silica, and what is their background? (Sections 6.1-6.5)

Reserve Silica is a wholly owned subsidiary of Reserve Industries, headquartered in Albuquerque, NM. Reserve Industries started in the uranium business 60 years ago, and grew to be a multi-national corporation with global interests in mineral exploration, extraction and processing. The three Melfi brothers assumed control of the company when their father retired in 1985. The brothers redirected the company more into industrial waste processing with the formation of another wholly-owned subsidiary, L-Bar Products, and purchase of the assets of Industrial Mineral Products, including a magnesium recovery facility in Chewelah WA and the Ravensdale silica sand mining lease. L-Bar Products was cited for numerous hazardous waste violations in Chewelah by WA DOE and the US EPA, including criminal charges by EPA. The Ravensdale mining lease was transferred over to the newly formed Reserve Silica subsidiary in 1990/91, prior to Reserve's closing down the Chewelah plant and filing for L-Bar bankruptcy in

1992. Reserve Silica operated the silica sand mining operation until its closure in 2007, and the pit filling dumping operation at Ravensdale since its inception. Reserve Silica has had numerous WA DOE violations and fines through much of its tenure. WA DOE classified the site as a Class 1 (highest priority) toxic cleanup site in January 2016. The Melfi brothers continue to be the principles in Reserve Industries, Reserve Silica and other subsidiaries.

Should Policy I-203 be extended in the 2016 KCCP to allow Reserve to submit their current proposal? (Section 5.5)

No. We believe Reserve has already had ample opportunity to submit a Demonstration Project proposal. It has been nearly four years since the mining site conversion demonstration project amendment to Policy I-203 was adopted to accommodate Reserve's request; they purchased their alternative TDR sending site for the project more than two years ago; they indicated they were within 2 weeks of submitting their proposal over a year ago; and their full, 273-page proposal document was dated May 1, 2016 – 3 ½ months ago. And yet no proposal has been submitted to date. There is still a four month window to submit a proposal before the 2016 KCCP is adopted. However, given the numerous issues with the current proposal as described within this document and the health and environmental risks associated with the property, this site is not suitable for residential development and no amount of additional time is going to change that. As such, Policy I-203 should be dropped from the KCCP so that reclamation work can be completed and the site returned to a Forest zoning and substantially restored to its pre-mining state.

What is FRCV's recommendation regarding Reserve's current proposal? (Section 1.1)

This site is NOT suitable for residential development, and there are no major barriers to reclaiming the majority of the site to where it can support viable forest uses for the long-term. To approve a residential use for this site would expose King County to substantial risk of future litigation from property residents and others. The Council should reject Reserve Silica's Demonstration Project proposal, revert the designated Land Use of the property to Forest and the zoning to Forestry and retain the property within the FPD; work with Reserve to develop a final reclamation plan that will reestablish viable forests on the majority of this property; and take steps to ensure Reserve follows through on these reclamation obligations.

2.0 IS RECLAMATION FOR FORESTRY "IMPRACTICAL"?

2.1 Executive Summary: Forest Reclamation

King County Code clearly indicates the Reserve Silica site should revert to a Forestry zoning upon completion of reclamation work, as it was zoned prior to being designated as Mining lands. The crux of Reserve's argument to upzone the property to Rural Residential is that the property is unsuitable for long-term forestry use without "significant and impractical investment." No information or data was provided to support this assertion throughout the extensive 2012 KC Comp Plan deliberations. However, Reserve Silica's May 1, 2016 proposal now suggests that 282 acres, or 75% of the property is suitable for long-term forestry use, with 71 of these acres to be used for a 72-house "rural community" and 211 acres put into a "Managed Forest." If the 55-acre wetland complex, which requires no reclamation and provides substantial secondary forestry benefits, is included, then 337 acres, or 89% of the property is apparently suitable for forests. However, analysis of the three studies* commissioned by Reserve Silica would suggest that 337 acres is probably an unrealistically optimistic figure. Rather, a more realistic estimate is that 265 acres, or 70% of the property is likely suitable for long-term forestry use.

Appendix I of the May 1, 2016 Reserve Silica proposal lays out AFM's recommended plan for reclaiming these lands for forestry. Using this plan, along with data from the 2012 IFC and UW studies, it is possible to derive a reasonable estimate of the costs to perform this forest reclamation, and thus test the validity of Reserve's pivotal assertion of "significant and impractical investment" being required to reclaim the bulk of the property for forestry.

Assessment of the cost to reclaim 265 acres of the property for forestry, given AFM reclamation recommendations, is something on the order of $70,000 – "significant" yes, but hardly "impractical." Using data from Reserve Silica's operation and from Erickson Logging's mine pit filling activity on the adjacent property to the east, this ~$70,000 "investment" likely represents only about two weeks' worth of average net profit from the filling activity Reserve has been doing for the past nine years. Furthermore, all three of the Reserve-commissioned studies agree that the 73 acres of well-stocked, 37-year old Douglas-fir plantations in the NE quadrant and SW corner of the property are suitable for commercial forestry as-is. These lands were planted by Burlington Northern Timberlands (Plum Creek predecessor) in the early 1980s, along with most all the other lands on and surrounding Reserve's current ownership. Erickson Logging has been very successfully logging precisely the same type timber on the adjacent lands to the east and south since 2007. Given Erickson's harvest yield experience, and a conservative estimate of delivered log prices from the Washington Department of Natural Resources, logging these 73 acres should yield something on the order of $400,000 net - after logging, hauling and replanting costs. This profit alone would cover the required forestry reclamation costs estimated for the 265 acres of Reserve's property five times over! This seems to be pretty compelling evidence to refute Reserve's assertion of an "impractical" cost to reclaim the majority of this property for Forestry.

If the forestry reclamation plan recommended by AFM and included in Reserve Silica's Demonstration Project proposal were to be implemented on the suitable 265 acres, this property would fully satisfy King County's criteria for defining "forest land of long-term commercial significance."

The likely driving force behind Reserve's aggressive lobbying for the proposed Demonstration Project and an upzone to their property is NOT to avoid a "*significant and impractical investment*" to reclaim the property for long-term forestry, as purported, but rather the desire to capture the windfall profit from selling residential lots, while also stripping off most of the remaining timber value on the property through the necessary land clearing for the housing development, and thinning of the remaining mature conifer plantation. The estimated benefit to Reserve Silica of selling residential lots were they to be granted an upzone and approval to install a 72-unit housing development on the property would be something on the order of $1,700,000 – net!

Based on this analysis, Reserve's Demonstration Project proposal should be flatly rejected. Further, a plan for reclaiming the majority of the property for forestry should be formulated and adopted, and steps taken to ensure Reserve Silica and its parent company, Reserve Industries, are held responsible and accountable for this work. The costs of this reclamation work are not an "investment" cost, but rather a business cost associated with the value Reserve received from operating, and degrading, the site through their mining and fill site activities over the last 30 years.

*International Forestry Consultants (IFC), Feb 13, 2012; University of Washington (UW), Mar 12, 2012; and American Forest Management (AFM), May 9, 2016.

2.2 What is the Magnitude of the Likely Forest Reclamation Costs?

The crux of Reserve's argument to upzone their Ravensdale property to Rural Residential is that the property is unsuitable for long-term forestry without "*significant and impractical investment.*" And if the site is thus impractical to use for long-term forestry, then their conclusion is that it makes no sense to return the property to a Forest zoning; but rather, its highest beneficial use becomes, instead, rural residential, with an accompanying Rural Residential zoning.

This argument is based on assertions that are not supported by data, evidence or experience. First, Reserve claims that the property is not suitable for long-term forestry without "*significant and impractical investment to create productive forest soils.*"[1] But both forestry studies commissioned by Reserve in 2012[2,3] to assess the forestry potential of this property concluded that with the exception of the 50 acres of mine pits currently being filled, the soil site quality on lands suitable for forest on this property are "*average for Douglas-fir production.*"[4,5] And the fact that Reserve's current proposal calls for the establishment of a "*211 acres managed long-term commercial forest*" is pretty compelling evidence against their assertion of 'impractical' investment required to reclaim the majority of the property to where it can support viable forests. In fact, this proposed 211-acre managed forest implies that 89% of the property (i.e., the 'managed forest' + the 71 acres proposed for development + the 55-acre wetland complex) are suitable for long-term forestry purposes.

When the 'impractical investment' argument was first submitted in February 2012,[6] the King County Executive and his staff (including forestry staff within DNRP) strongly disagreed with this conclusion, stating:

> "*Restoring the open mine area to forest is possible and should be required" . . ."it is reasonable to expect that it* [the mined area] *will be reclaimed and replanted to forest.*" "*Other active and past mines in the vicinity* [Grouse Ridge; adjacent Wagner/Erickson property] *are expected to be restored to productive forest.*" "*What they* [Reserve Silica] *consider a forest investment should be properly classified as a mining reclamation investment.*" "*On the Reserve Silica site, we expect that managed commercial forest will offer greater environmental benefit than building on the most productive areas and leaving the rest unmanaged."* [7]

These sentiments were reinforced by the King County Rural Forest Commission, which also disagreed with Reserve Silica's critical conclusion and identified the lack of supporting data behind this, stating:

> *"Both reports* [International Forestry Consultants and UW Gordon Bradley reports to the Reserve Silica owners] *appear to assume that restoration of the affected forest land would be too expensive as a forest investment,* ***without providing analyses of potential restoration methods and alternatives along with related economic analyses and cost estimates****.* [emphasis added] *From our perspective, the cost of reclamation should be viewed as a cost of mining. Since these lands were originally mostly timbered, it is reasonable to assume that mining activities were the main cause of soil productivity decline. The mining operation, not the future owners of the property, should bear the responsibility and costs for restoring site and soil productivity to pre-mining values*." [8]

With the newest information provided in Reserve Silica's May 1, 2016 proposal, a recommended forestry reclamation plan has now been proposed by Reserve's consultant, American Forest Management (AFM).[9] By utilizing these reclamation assumptions, in conjunction with data from the 2012 IFC and UW studies, we are now able to dimension the magnitude of the financial costs required to reclaim the majority of the property for forestry use, and thus test the validity of Reserve's 'impractical investment' assertion

2.3 Assessment of Reclamation Costs

2.3a Areas Suitable For Reclamation To Forestry

The area AFM is recommending for "Managed Forest" (see Figure 1. AFM Management Units) includes 8 acres of Type 1 land, 34 acres of Type 2, 23 acres of Type 3, 50 acres of Type 4, 8 acres of Type 5, 6 acres of Type 6, 30 acres of Type 7, and 52 acres of Type 8; totaling 211 acres. In addition, the two development areas would clearly be suitable for forestry if not converted to a rural residential development. The North residential area is 33 acres, of Type 2 conditions; while the South residential area is 38 acres of Type 7 conditions. (This total of 71 acres includes 54 acres cleared for residential lots plus 17 acres of open space buffer strips between the housing clusters.) So the total land suitable for forestry under AFM's proposal is 282 acres (211+33+38), or 75% of the property. And an additional 55 acres are a Class 1 (KCC 21A.06.1415) wetland complex with buffers, on the southern portion of the property. While AFM does not propose this wetland complex to be managed for forestry, this area provides extensive secondary forest benefits, and should clearly be included as a viable part of any managed forest property. Including these 55 acres would imply a total of 337 acres, or 89% of the property, would qualify as forestlands under AFM's proposal. This fact alone tends to dispute Reserve's key conclusion that the majority of the property is not suitable for forestry without impractical investment.

King County Class 1 wetland on southern portion of Reserve Silica property. (M.A. Brathovde, July 2016.)

In reviewing this proposal, we believe the AFM view is overly aggressive, and represents a "most optimistic" view of how much of the site could potentially be suitable for forestry. Under the AFM proposal, only 40 acres outside of the two residential development areas and the wetland complex would be excluded from forest management - the capped toxic waste dump sites, the BPA powerline easement and a portion of the Type 1 steep slope coal tailings.

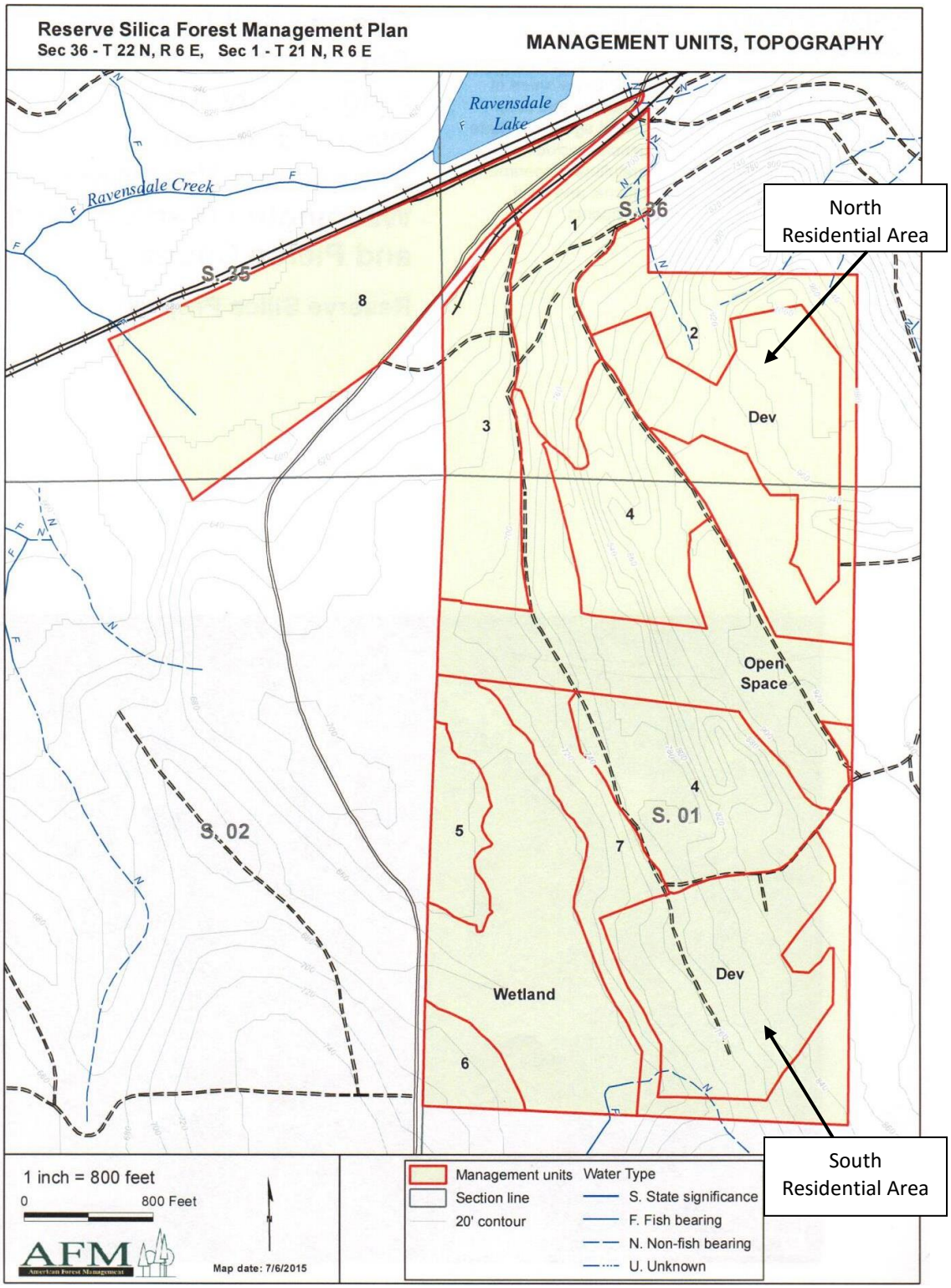
We agree with IFC and UW 2012 conclusions that the 52 acre plant site and clay ponds (AFM's Type 8) could NOT be effectively reclaimed for forestry. The clay ponds that dominate this site are reportedly 25' deep, and would require extensive decompacting, dewatering and soil amendments, and even then, any ability to operate harvesting equipment on the site would be highly doubtful.[1] We would suggest this area be reclaimed as open space lands, rather than forestry. We also agree with IFC and UW that all but 3 acres of AFM's Type 3 (totaling 23 acres) cannot confidently be managed for forestry, as these 20 acres are part of the Holcim Remediation Area, and contain monitoring wells and other structures intended to control (as yet unsuccessfully) the highly toxic leachate and runoff from the hazardous waste dump sites on the property. There is an easement on this portion of the property (and the capped dump sites) that gives complete control of the surface, subsurface and groundwater of this 20 acres to Holcim, for their mandated environmental obligations. As such, the County, Reserve and Holcim should coordinate to develop a mutually agreeable reclamation plan for this area, but it is highly unlikely that such a reclamation plan would include forestry.

June 2010 aerial photo of three main clay settling ponds and plant site (to right) adjacent to BNSF railroad and Ravensdale Creek and Ravensdale Lake. (Image: Google Earth Pro.)

After adjustment for these deletions, the area suitable for forestry (including the wetland complex) would total about 265 acres, or 70% of the property. [211 Managed Forest recommended by AFM + 71 Development & Buffer Areas + 55 Wetland Complex - 52 Plant Site/Clay Ponds - 20 Holcim Mitigation Area].

The IFC data shows that of these 265 acres, only the 50 acres of recently filled mine pits (Type 4) and the Wetlands complex, have a DNR Site Class of less than III (average forestland site), or a Land Grade of less than 3. Both IFC and UW agree that the soil site quality on these largely undisturbed lands is "average for Douglas-fir production."[2] This indicates that the underlying soils on these lands have not been substantially degraded as a result of the years of mining activity on the property. The 55-acre Wetland Complex is intact, has not been significantly impacted by any mining activity, and requires no reclamation work.

Figure 1. AFM Management Units.



2.3b Forest Reclamation Assumptions

The table below is a summary of the acres considered by this analysis as suitable for forestry use after reclamation. The acreage is identified according to AFM's "Type" classes, the current timber conditions on that Type (drawn from IFC, UW and AFM studies), and the assumed Reclamation Plan (derived from the AFM recommendations). Note that the 2012 IFC and UW studies, in some cases, used a different "Stand" numbering system from the AFM "Types." In these cases, the IFC/UW Stand number that corresponds to each AFM Type is also shown.

AFM Type	Acres	Current Conditions	IFC/UW Stand	Reclamation Plan
1	8	Age 24 hardwoods	3	Harvest now at break-even; apply herbicides; plant Douglas-fir
2 + Dev N	67	Age 37 well-stocked, Douglas-fir plantation	2	Harvest now, replant to Douglas-fir
3	3	Age 40 hardwoods; poor form	4	Harvest now at break-even; apply herbicides; plant Douglas-fir
4	50	Filled mine pits	6	Short rotation of alder, then slash; second rotation of alder; then plant Douglas-fir
5	8	Age 27 mostly hardwoods	8	Precommercial thin, favoring conifer & alder; let grow for 15 years, commercial clearcut, apply herbicides and replant to Douglas-fir
6	6	Age 37 well-stocked, Douglas-fir plantation	9	Harvest now, replant to Douglas-fir
7 + Dev S	68	Age 34 mostly hardwoods	7	Precommercial thin, favoring conifer & alder; let grow for 15 years then commercial clearcut, apply herbicides, plant Douglas-fir
Wet	55	Wetland complex	Wet	No reclamation required
TOTAL	**265**			

Reclamation Cost for AFM Types 1 & 3 (11 acres)

For these two small near-mature hardwood types, AFM calls for a commercial harvest now, then treating the unit with a specialty herbicide such as Forestry Garlon XRT to control woody plants and weeds, then replanting to conifers. It would be fair to assume the logging operation would not be much more than break-even, with delivered log values just offsetting logging and transportation costs. Treatment with Forestry Garlon XRT might run $110/acre,[1] while IFC would indicate planting costs would run about $250/acre. So the total cost for reclaiming these 11 acres for forestry might run ~$3,960 [($110+250)*11 acres].

Harvest of mature/near-mature hardwood stands of AFM Types 5 & 7 (76 acres)

Type 7, including the South Development area, at 68 acres, dominates these mature hardwood Types. AFM calls for commercially thinning this 34 year old stand now, removing some of the lower-valued hardwoods and leaving the minor conifer component and some of the hardwoods. IFC calls for holding this stand for another 15 years, then commercially clearcutting it, treating it with herbicides to control the weed and

Type 7 hardwood stand on southern portion of Reserve Silica property. (M.A. Brathovde, July 2016.)

woody competition, and replanting to Douglas-fir. We will assume a break-even commercial thinning now, then a commercial clearcut harvest in year 15, generating net income sufficient to cover an herbicide application and replant to Douglas-fir.

Type 7 hardwood stand. (M.A. Brathovde, July 2016.)

Type 5 is an 8-acre stand of predominately near-mature hardwoods (~age 27). AFM calls for holding this stand for 10 – 20 years, then clearcutting it. UW suggests a precommercial thinning now, favoring leaving the Douglas-fir, alder and western red cedar in the stand – very similar to AFM's recommendation for the slightly older (age 34) Type 7, except the thinning would not be expected to break even financially. We will assume a precommercial thin now (assume $150/acre net cost); followed by clearcutting in 15 years (stand age 42) generating sufficient net income to cover an herbicide application and replanting to Douglas-fir. So the net cost for reclaiming these 76 acres for forestry might run ~$1,200 ($150*8 acres].

Forestry Reclamation Cost Estimate AFM Type 4 - Filled Mine Pits (50 acres)

The 50 acres of recent mine pits are currently being filled under an Interim Reclamation Plan, which will restore the rough grades of this area to their pre-mining contours with clean fill and approved inert material. These filled areas will then be capped with a ~2' lift of topsoil and hydroseeded.[2] This work is progressing now, and Reserve anticipates completing this effort by the end of 2016. This work needs to be done regardless of whether the property is returned to Forestry use or upzoned for Rural Residential. As such, the costs for this activity should NOT be included in the "forestry reclamation" accounting, and thus should not be contributing to Reserve's assertion of "significant and impractical investment" to reclaim the land for long-term forestry.

Backfilling operations at the Ravensdale site. (reservesilica.com)

In reality, in all likelihood, this pit-filling activity is a significant net revenue generator for Reserve Silica. Their posted dumping fees are currently $125 - $150 per truck.[3] Frank Melfi reports that truck traffic into the Reserve Site has varied from a low of 20 trucks per day, to a high of 400 trucks per day.[4] The Traffic Impact Report by Transpo Group dated June 17, 2015[5] shows an average of 108 trucks per day over the 7-week period April 27, 2015 – June 12, 2015. This is the rate used to assess the likely net traffic impact of Reserve's Development proposal, so should represent a reasonable average of pit filling activity. Based on these numbers, the apparent revenue generated from the pit filling activity should be running somewhere in the $13,500 - $16,200 range per

day on average. While we don't know Reserve's costs for this pit filling activity, and thus cannot compute a net income from pit filling, Kurt Erickson's trench-filling operator who manages the comparable activity on the property immediately east of Reserve, reports that their net profit for filling activity runs between $100 and $200 per truck.[6] And the Site Development Specialist for the County's Department of Permitting and Environmental Review, who oversees the Reserve pit filling activity, has made the comment that he would "much rather have a permitted fill site than a gold mine," referring to the financial profitability of fill sites like Reserve's and Erickson's.[7] Given this anecdotal evidence, it's probably fair to guess that Reserve's net profit for the pit filling is perhaps $75/truck, or about $8,000 per day on average. As for the topsoil capping requirement, Erickson is currently capping ~12 acres of filled mine trenches on his property, using topsoil trucked in as part of his ongoing filling activity.[8] In Reserve's case, the Interim Reclamation Plan[9] shows two "Topsoil Storage Areas" for use in capping the three remaining mine pits. Typically what would occur is that the native topsoil would be scraped off and stockpiled before a mine pit is opened. Then on completion of the mining and filling of the pit with off-site fill, the native soil would be spread back over the graded pit. Whether this is the case with Reserve, or whether the "Topsoil Storage Areas" are of imported topsoil, is unknown. In any event, the topsoil capping activity is included as part of Reserve's Interim Reclamation Plan, and is required regardless of future use of the site. As such, topsoil capping costs should not be attributed to forestry reclamation.

Once the mine pits are filled, graded and capped with topsoil, AFM calls for planting the newly reclaimed land with red alder to help colonize this site, and to help restore the soil productivity. IFC and UW studies also support this proposal. IFC anticipates significant risk of rodent/deer damage to this first crop of trees, so calls for steps to protect the seedlings (e.g., additional seedlings planted, mesh sleeves), which will effectively double the normal planting costs. While AFM does not mention this, we agree with IFC that seedling protection steps be specified as part of the forestry reclamation on these pits. IFC estimates a planting plus seedling protection cost of $500/acre. The AFM plan indicates that the first rotation of alder will likely start to decline in vigor after about 5 to 10 years. As such, they call for regular monitoring of the stand from age 6 to age 15, and doing a commercial harvest or a precommercial slashing, depending on the size of the timber, when vigor starts dropping off significantly. For estimating purposes, we will assume the stand liquidation occurs at age 10, and is a precommercial slashing (scarification), costing $25/acre. Note that IFC suggests periodic application of biosolids could help rebuild the soil through this first rotation, but AFM does not call for that in their reclamation proposal. The County is currently running trials on the application of biosolids on Reserve's mined property.[10] Following liquidation of the first crop of alder, a second rotation of alder would then be planted, though the need for extra seedling protection should be reduced or eliminated. IFC planting cost of $250/acre will be assumed. This second rotation of alder should retain vigor for a longer period of time. While AFM does not call for any thinning of this commercial second crop of alder, IFC did call for a precommercial thinning, at $110/acre. We think it makes sense to allow for this thinning on the second rotation, and assume it would occur when the stand is about 15 years old (or 25 years from now). On this second rotation, we also assume the monitoring could occur every other year, rather than annually as in the first rotation. We are also assuming that the point of significant vigor decline in this second rotation would occur at about stand age 25. At that point, it would be fair to assume that this

second crop could be commercially harvested, generating net revenues in excess of costs required for planting a third rotation of Douglas-fir.

So a reasonable estimate of reclamation costs for forestry on the 50 acres of recently filled mine pits is as follows:

Year	Activity	Cost/Acre
1	Plant alder seedlings and install protective sleeves	$500
6-10	Annual monitoring	$4/yr
10	Precommercial slashing/scarification of unit	$25
10	Plant second rotation of alder	$250
16-25	Biennial monitoring ($4/ac every other year)	$2/yr
25	Precommercial thinning of alder	$110
35	Commercial harvest of alder, use logging proceeds to replant to Douglas-fir	$0
	Cumulative Cost/Acre	$925
	Total Cumulative Cost to reclaim 50 acres for commercial forestry	**$46,250**

Harvest of mature Douglas-fir plantations of AFM Types 2 & 6 (73 acres)

These two Types are 37 year-old, well-stocked Douglas-fir plantations growing on Site Class III (and II). This is precisely the same timber types that Erickson Logging as been harvesting on the adjacent property to the east and south since 2007. Both of these properties (Reserve and Erickson) were previously owned by Burlington Northern Timberlands, which became Plum Creek Timber Company in 1989. BN Timberlands logged the second growth timber on these lands in the late 1970s/early 1980s, replanting them to Douglas-fir at approximately 435 stems per acre. On the most recent 628 acres of harvest, Erickson Logging predicted log deliveries to average 13.3 mbf/acre (thousand board feet/acre), removing an average of 94% of the standing merchantable volume.[11] It would seem reasonable to assume the stocking level in Types 2 and 6 on Reserve Silica's property are similar. The Washington Department of Natural Resources (DNR) reports an average delivered log price for coastal Douglas-fir 3SM logs in April 2016 to be $549/mbf; and *Forest Stewardship Notes, Lumber, Log and Stumpage Prices in Washington State* indicates an average logging cost of $110/mbf. So a reasonable estimate of the net stumpage value of the merchantable Douglas-fir on Reserve's 73 acres of Type 2 & 6 (including the North Development Area) is $426,225 (73 acres * 13.3 mbf/acre * ($549-$110)). Using IFC's cost estimate of $250/acre to replant the unit to Douglas-fir implies a planting cost for the 73 acres of $18,250. With these assumptions, Reserve

Type 2 Douglas-fir timber stand on northeast quadrant of Reserve Silica property. (M.A. Brathovde, July 2016.)

Type 2 Douglas-fir timber stand. (M.A. Brathovde, July 2016.)

might expect to realize a net profit of $407,975 from harvesting these two units and replanting them to Douglas-fir.

2.4 Estimate of Total Forestry Reclamation Cost

The forestry reclamation assumptions above are generally based on AFM's recommended treatments, except we are including the northern Development Area with Type 2, and the southern Development Area with Type 7; and in the case of Type 2, we are clearcutting the entire unit, rather than just thinning outside of the clearcut development areas as proposed by Reserve. (Reserve is suggesting thinning between the housing clusters to generate a more open forest, which would be more visually appealing for the Development's residents.) We have supplemented AFM's recommendations with recommendations from IFC and from UW, and attempted to price out recommended reclamation activities for each Type, using IFC cost data wherever possible, and supplementing the cost information with internet research as needed.

In aggregate, across the 265 acres we would recommend reclaiming for forestry, the total cost, given the assumptions described above, are estimated to run on the order of $70,000; while the net revenue from clearcut harvesting the 73 acres of Type 2 & 6 (the 37-year old Douglas-fir plantations), including the Development Areas, is expected to run approximately $400,000.

The purpose of the analysis above is not to predict specific costs or revenues, nor to fine-tune reclamation treatment regimes. Instead, the analysis is aimed at trying to affirm, or reject, Reserve's pivotal assertion that the property is unsuitable for long-term forestry without "significant and impractical investment." While the reclamation and cost assumptions underpinning this analysis should be vetted and refined, the bottom-line conclusion is obvious and robust – ***the costs to "reclaim" ~70% of the property to where it can support viable forest uses is NOT particularly "significant," and certainly not "impractical," as asserted by Reserve***. The estimated $70,000 total cost probably represents about two weeks profit from Reserve's pit filling activity, which has been ongoing since 2007.[1] And just clearcut harvesting the 73 acres of existing 37 year-old, well-stocked Douglas-fir plantations in the northeast and southwest corners of the property, which were planted by Burlington Northern Timberlands and somehow managed to avoid being degraded through decades of mining activity on other parts of the property – and which are the exact same type of timber Erickson Logging has been harvesting for the past 9 years on the adjacent property to the east and south – is expected to cover ALL of the projected Forestry Reclamation costs 5X or 6X over!

2.5 Hasn't This Property Always Been Primarily a Mining Site?

Reserve asserts that the property has "*been used for or supported mining since the turn of the last century* [i.e. 1900]," and implies that mining uses have dominated the property use ever since.[1] Available data indicates coal mining activity on this property started 1924.[2] Until the mid-1940s mining occupied ~ 4% of property.[3] By the end of the coal mining days, in 1947, mining occupied ~7% of surface of this property.[4] Reserve confirms that there was no mining on the property from 1948-1966. Silica mining started in 1967, growing to occupy 34% of surface by conclusion of mining activity in 2007.[5] Up until Reserve's purchase of the property in 1997, the mining activity was through leases of portions of

the property from the Northern Pacific/Burlington Northern/Plum Creek owners. The NP/BN/PC owners continued to manage the non-mined portions of the property as part of their ~8,400 acre timberlands block into 1980s.[6,7,8] So while mining has been active on this site for 65 years, it has tended to occur on a relatively small portion of the property.

1965 aerial photo showing Reserve Silica property and surrounding lands heavily timbered. Old strip mines are largely revegetated. (King County Road Services Map Vault.)

On the forestry side, evidence indicates the old growth timber on the property was likely logged in the 1890s.[9] Aerial photography indicates the natural second-growth was logged from much of the property in the mid-1930s.[10] Aerial photography again shows that the majority of the property was logged by BN/Plum Creek in 1980/1981, and replanted, with some evidence of subsequent thinning.[11] With the exception of the plant site/clay settling ponds, the whole property was zoned Forestry and included within the FPD until the mid-1990s.[12,13,14] Reserve has done no forest management activity since their purchase of the property in 1997.[15]

The evidence strongly disputes Reserve's assertion that this property has been used mostly for mining since the turn of the last century. In fact, the majority of the property has been actively managed for forestry well into the 1980s.

2.6 Is Proposal Compatible with Surrounding Land Uses and Supported by Adjacent Property Owners?

Reserve claims "*All property owners adjacent to the mining site wrote letters of support for the RS proposal explaining that they each considered the proposed site plan submitted by RS would be compatible with surrounding uses.*"[1] Note that in response to our objections expressed after Reserve's original submission in April 2016, they have footnoted this statement in their May 1 proposal, indicating that "*After submittal, the two small properties west of the mining site were sold. One of the new owners confirmed support for the RA-10 proposal. One did not.*"

It is worthwhile to note that the letters of support they refer to were form letters signed, at Reserve's request, in Jan/Feb 2012 by the three adjacent (non-County) owners, and the 'proposed site plan' presented to these owners at the time was a 32-unit development[2,3] – substantially different from the current 72-unit proposal. And to correct their May 1 footnote, one of the two parcels was actually sold prior to Reserve's 2012 submittal, and thus the signer of this letter wasn't even an owner at the time he signed the letter. The signer of the second letter formally retracted his letter of support prior to Reserve's submittal. He sold his property shortly afterward, and the new buyer, Chris Powell (P&D

Logging), submitted a letter specifically objecting to Reserve's upzone.[4] He has also recently re-confirmed his continued opposition to Reserve's proposal.[5]

52% of lands on the perimeter of Reserve's property are owned by Wagner/Erickson, 23% by the County, 12% by Chris Powell, and 13% by Baja Properties. Wagner's support was based on the 32-unit proposal, and has not been reconfirmed for the current 72-unit proposal. The County's ownership is all in designated Natural Area and Open Space lands that allow no residential development of any kind. They have not been consulted in terms of whether Reserve's 72-unit 'rural community' would be compatible with these Natural Area/Open Space lands or not. It is our opinion that having a 72-unit rural community, in the middle of a 3,500-acre block of protected lands[6] where NO houses will be constructed, is NOT compatible with these Natural Area/Open Space lands. Powell sent a strongly worded letter to Paul Reitenbach, Comp Plan Manager in 2012,[7] clearly indicating that he did NOT support the proposed upzone and residential development. He has indicated that such a development (40-units at that point) could seriously impede the operation of his forestry-related business that he operates, under a forest management plan approved and monitored by the County. Reserve's latest footnote[8] indicates that the Baja Properties owner has confirmed his support for Reserve's current proposal. We have not attempted to confirm Reserve's footnoted statement of this owner's support. It should be noted though that Reserve has an unrecorded agreement with Baja Properties on this property that presumably allows Reserve's infiltration ponds and monitoring wells on the Baja property, as well as access rights across this property.[9] So there may well be an outside motivation on Baja's part to 'support' Reserve's proposal.

The County Exec's staff in 2012 concluded "*Forestry is the use most compatible with the surrounding land use.*" And that "*… residential development on this site could result in conflicts with adjacent forestry and mining.*" And "*…… a cluster subdivision and open space would likely not prevent conflicts* [on adjacent properties]."[10]

Given the above, we conclude that ***the current Reserve proposal is NOT supported by all the adjacent owners, and*** furthermore, that this proposal ***is NOT compatible with either the adjacent FPD lands, nor with the adjacent Rural-zoned Natural Area/Open Space lands***.

2.7 Doesn't Reclamation for Forestry Conflict with the IFC and UW Study Conclusions?

To contest the County Executive's 2012 recommendation to return the post-reclamation Reserve Silica property to a Forestry zoning, Reserve commissioned two studies to assess the forestry potential of the property – one by International Forestry Consultants, Inc. (IFC),[1] and one by the University of Washington School of Environmental and Forest Sciences (UW).[2]

The key conclusion drawn by IFC is that, largely because of the impacts of decades of mining and dumping on the property, and a lack of any forest management over the mining tenure, a typical industrial timberlands investor (e.g., a Weyerhaeuser, Hancock, or Plum Creek) would not be interested

in purchasing the Reserve property in whole for long-term commercial forestry uses. This key conclusion is seconded by the UW study - and we fully agree with this.

However, Reserve's interpretation from the IFC study is that making the land suitable "*for long term commercial forestry would require significant and impractical investment to create productive forest soils*" is misleading. First, both studies confirm that the soils on the majority of the property that can be used for forestry purposes (excluding the 50 acres of recently filled mine pits) are "average for Douglas-fir production"[3] (Site Class III or above). Second, the IFC study conclusions list a series of five separate 'considerations' that "*all combine to reduce capacity for large scale commercial timber production on the site*." One of these five considerations is described as "*expensive forest restoration needs.*" For Reserve to pull this factor out and portray it as the key factor driving the unsuitability of the property for long-term commercial forestry is misleading and self-serving. And in both studies, it is obvious that Reserve is including the Interim Reclamation Plan requirements (filling, grading and capping the huge mine pits that existed in 2012, and which at the time Reserve expected would require another 10+ years to complete) as part of their estimated "forest restoration needs." This Interim Reclamation work is required of Reserve regardless of whether the property is upzoned for residential use, or returned to a Forestry zoning. As such, these costs should NOT be considered "forestry reclamation" costs. And in neither study do the authors conclude that the forestry reclamation costs are "impractical." That is Reserve's interpretation, and it is not supported by the Rural Forest Commission,[4] nor by Reserve's May 1, 2016 proposal to reclaim 211 acres to "Managed Forest."

Reserve Silica mining pits in 2007. (Gene Criss, 2007, myspace.com)

The other key conclusion drawn by the UW study is that "*it does not appear that the Reserve Silica property could be clearly classified as forest land with long term commercial significance by …. King County*." This conclusion is addressed in Section 2.8, which demonstrates that if the forestry reclamation proposed by Reserve is implemented, and the UW assessment was updated to reflect this activity and today's conditions, the property would fully satisfy the definition of "forest land of long term commercial significance."

In conclusion, **reclaiming approximately 265 acres of Reserve's property for forestry would be compatible with the IFC and UW studies, and would comply with GMA and with King County's definition of "forest land of long-term commercial significance".**

2.8 Does This Property Meet GMA and King County Criteria for 'Forest Land of Long-Term Commercial Significance'?

Reserve Silica indicates that their contracted studies confirmed that the property does not qualify as 'forest land of long-term commercial significance' based on GMA or KC requirements, and thus should not be zoned Forestry and placed within the Forest Production District.[1]

The key conclusion drawn by IFC from their study is that, largely because of the impacts of decades of mining and dumping on the property, and a lack of any forest management over the mining tenure, a typical industrial timberlands investor would not be interested in purchasing the Reserve property in whole for long-term commercial forestry uses.[2] This key conclusion is seconded by the UW study - and we fully agree with this. But just because an industrial timberlands investor (e.g., a Weyerhaeuser, Plum Creek, Hancock type owner) would not be interested in purchasing the property, in whole, does not necessarily imply that the property is not suitable for long-term commercial forest use.

The key study that addressed this property's fit with GMA and KC definitions of long-term commercial forest lands is the UW study,[3] which concluded that "*it does not appear that the Reserve Silica property could be clearly classified as forest land with long term commercial significance by …. King County*." This study identified four criteria used by King County to determine forest land with long term commercial significance – (a) predominant parcel size ≥ 80 acres, (b) site characteristics make it possible to sustain timber growth and harvest over time, (c) adjacent residential development is scarce, and siting of future dwelling likely to limit any adverse impacts to forestry, and (d) predominant land use of the property is forestry. Of these four criteria, UW concluded that only criterion (a) was fully satisfied by Reserve's property, and criterion (b) was partially satisfied. As such, UW concluded that the Reserve property did not meet the County definition of forest land of long term commercial significance.

Since this 2012 assessment, the remainder of the non-Forest Production District lands west of Reserve is now ALL within the Black Diamond Natural Area, and thus will never have any residential development. All the FPD lands to the northeast, east and south of Reserve are under Conservation Easement owned by Forterra, which does not allow any permanent structures. The 39-acre FPD property on Reserve's west boundary is being used for forestry-related purposes, under a forest management plan approved and monitored by the County, and has no residence. And lastly, according to Reserve, the 13-acre FPD parcel to the west has been used as a residence and private woodlot.[4] If correct, this is the ONLY parcel ANYWHERE around Reserve that will ever support a residence. But current Google Earth imagery appears to indicate that even this parcel is not being used for residential use; and it is currently being taxed as current use forestland. So condition (c) from the King County list of factors clearly is fully satisfied by Reserve's property.

The UW's conclusion that condition (b) is only partially satisfied by Reserve's property, and that condition (d) is not satisfied, was based on conditions as of 2012 when UW evaluated the site. With the forestry reclamation plan recommended by AFM and included with Reserve's current proposal, and

applying this plan to the areas Reserve proposes to build houses on, both criteria (b) and (d) would be fully satisfied. As such, if the AFM reclamation plan is implemented on the 70% of the property recommended above, ***Reserve's property WILL fully satisfy King County's definition of forest land of long term commercial significance***.

Satisfying the KC requirements for forest land of long-term commercial significance should satisfy the 1994 GMA requirements. Note that the 1994 GMA definition is sorely out of date. The Rural Forest Commission estimated in 2012 that no more than 30% of the total timberlands within King County's FPD would satisfy the outdated 1994 GMA definition.[5] And evidence would indicate further declines since 2012.[6] With the proposed reclamation and forest management, the Reserve property could actually satisfy even the 1994 GMA criteria.

2.9 Why is Reserve Promoting Conversion to Rural Residential Development?

The 67 acres of largely undisturbed, 37 year-old, well stocked Douglas-fir plantations of AFM Type 2 is the primary existing forest resource of significant current value on the property. Portions of this are also located on the highest productivity soil on the whole property, being classified as Site Class II – above average for commercially productive forestland. Of these 67 prime acres, Reserve is proposing clearing 33 acres, half the area, for the north Development Area. This development includes about 25 acres cleared for homesites, plus about 8 acres for 'open space buffers' between the housing clusters. For the 34 acres outside the north Development Area, as well as the 8 acres of 'open space buffer' strips Reserve is calling for a thinning to retain a forest cover while improving the aesthetics of the surrounding forest for the north residential development. In such a commercial thinning, Reserve could easily remove over half of the merchantable timber value on the site, and still leave a very attractive and more 'open' forest. And the 25 acres that are to be cleared for the north development would essentially be clearcut. As such, Reserve could realize approximately $292,000 of net stumpage value through the clearing of the north homesites, and the thinning of the surrounding stand and buffers, in addition to the value of the 32 residential lots in this north Development area.

The 38 acres of the south Development Area lies within AFM Type 7 (the 34 year old hardwood stand), and has very little net forestry value today. The reclamation plan is to thin this stand at break-even, then to hold it for 15 years for a commercial clearcut that would hopefully generate sufficient net revenue to cover the herbicide treatment and planting cost to establish a conifer plantation. So we don't attribute any near-term net forestry value to the existing forest in the south Development Area.

The sales value of selling 72 homesites to a developer in today's real estate market should realize something on the order of $40,000 per homesite,[1] or $2.88 million. So by getting an upzone to RA-10 and approval to install a 72-unit housing development, Reserve stands to gain ~$2.7 million above what the forestry retention option might be expected to yield ($2,880,000 value of selling rights to develop 72 lots to a developer + $292,000 net forestry proceeds from clearing homesites and thinning surrounding stand - $426,225 net value of Stand 2 if clearcut today and replanted). However, 25 of these 72 development credits would come from Reserve's Black Diamond property (now under ownership of

Reserve Silica's sister company, Reserve Properties, LLC), thus likely reducing the value of that property by ~$1.0 million (25 development rights at $40K/lot sales value to a developer). So the net benefit to Reserve if they can get the upzone and development approval is likely something on the order of $1.7 million, over the option of retaining the land for forestry.

As such, it would appear that ***the driving force behind Reserve's aggressive lobbying efforts for the proposed Demonstration Project and an upzone to their property is NOT to avoid a "significant and impractical investment" to reclaim the property for long-term forestry, but rather, it is the desire to capture the windfall profits of selling residential lots, while also stripping off most of the remaining timber value on the property through clearing for the residential development, and thinning the surrounding mature conifer stand for aesthetics.***

2.10 Who Would Buy These Lands From Reserve if Upzone Denied and Property Reclaimed for Forestry?

Frank Melfi, President of Reserve Silica, has stated that their desire is to sell off these lands and close out the Reserve Silica business.[1] The three principals of Reserve Silica/Reserve Industries are the three Melfi brothers, who are all in their late 70's and 80's, and two are experiencing major health issues. Gaining an upzone to the property to RA-10, and permission to establish a 72-home rural residential development on the property, would lead to a huge windfall profit for the brothers, as it would make the property of interest to potential residential development buyers – who, by the way, generally have no interest, nor expertise, in forest restoration or management.

IFC concluded, correctly we believe, that the typical industrial forestry companies (e.g., Plum Creek, Weyerhaeuser, Hancock, etc.) are not going to be interested in purchasing this property, even if all the proposed forestry reclamation tasks were initiated. The location of the property (too near to large urban populations), the highly degraded and fragmented condition of most of the existing timber resource through past neglect (other than the 73 acres of Types 2 & 6), the long time commitment to get the recently-filled mine pits to a point where they can support a commercial crop of timber (35+ years out), and the HIGHLY uncertain environmental risks on portions of the property (capped hazardous waste disposal sites, uncapped remediation area, plant site and 25' deep clay settling ponds, and unknown but potential contaminants on other portions of the property), would turn most all typical industrial forestland owners away.

However, there are viable markets for this property – though not likely to a single buyer. The 67 acres of AFM **Type 2, including the north Development Area**, would, with a high degree of certainty, be of interest to Fred Wagner/Kurt Erickson, the adjacent property owners to the East. Not only is this adjacent to their existing ownership, but it is precisely the same type of timber they have been very successfully harvesting and replanting for nine years now. In addition, they have received approval from King County to fill two additional mine trenches that lie primarily on their existing property, but also run up onto Reserve's Type 2 ownership. Erickson has no practical means of accessing these trenches without crossing Reserve's Type 2 lands. Without the ability to cross Reserve's property and fill the upper portions of these mine trenches extending onto Reserve's property, filling of the bulk of the lower

trench areas on the Wagner/Erickson property would entail such major logistical and environmental problems that the County and Forterra (which holds the Conservation Easements on the Wagner/Erickson property) might prohibit Erickson from moving forward with filling of these trenches. So there is a highly-motivated buyer for this premier portion of Reserve's property.

Adding the 21 acres of **Type 1** lands to the Type 2 package would provide an independent (other than Wagner/Erickson) forestlands buyer good access to the Type 2 forest. This addition may also be of interest to Wagner/Erickson, as that would also provide a much better access route to their existing property to the east (access to the Wagner/Erickson property was originally across Reserve's Type 1 land, when Plum Creek owned both tracts). In addition, adding the Type 1 land would bring the total package up to 88 acres – above the 80-acre threshold required for siting a single-family residence on these Forest Production District lands, thus greatly expanding the pool of potentially interested buyers. Finding a market for the Type 2/Type 1 land should not be an issue.

The land owner adjacent to Reserve on the West, Chris Powell, owner of P&D Logging, has previously expressed to Reserve an interest in purchasing some of Reserve's land adjacent to his property. Frank Melfi declined to discuss options with him, because Reserve was pursuing the current large scale development project.[2] So there is an interested buyer for some of the lands on the west side of the property, particularly the 8 acres of **Type 8**.

The **capped hazardous waste sites, and the uncapped remediation area** downslope from the capped sites, are under Easements to Holcim, which has responsibility for the CKD hazardous wastes. This easement gives Holcim complete control of the surface, subsurface and groundwater under these 48 acres. These capped lands can never be used for any forestry or residential uses, and likely can never be used for any purpose whatsoever other than containment of the hazardous waste. As such, the land actually has a negative value. These lands should just be transferred over to Holcim. Significant portions of the **BPA powerline easement** are occupied by the two capped hazardous waste sites and the uncapped remediation area. So it would probably make sense to sell/donate the land underlying the BPA powerline easement to Holcim also. This would provide Holcim with ownership connectivity between the upper capped waste site (the Dale Strip Pit) and the lower capped waste site (Lower Disposal Area).

The 55-acre **wetland complex** is adjacent to the almost 1,000-acre Black Diamond Natural Area. Adding this King County classified Class 1 wetland to the Natural Area under County ownership would be a great addition.

The 52-acre **plant site and clay ponds** are also adjacent to the Black Diamond Natural Area, with the plant site separated from Ravensdale Lake only by the Burlington Northern rail line. Some kind of public ownership for this portion of the property, as Open Space lands, would probably make the most sense. Wagner/Erickson may also be interested in purchasing portions of this property to service (e.g., wheel wash, check station, office) their existing ownership, as the Conservation Easement on their current property does not allow any permanent structures or development that could accommodate these facilities.

The 68 acres of property comprising the **Type 7 and the south Development Area**, south of the powerlines, and east of the wetlands complex, excluding the newly filled mine pit, would likely be attractive to a private investor who wanted to purchase their own, private forest. Including the ~28 acres of the recently filled, to-be capped and alder-planted mine pit south of the BPA powerline (**Type 4-south**) would bring this ownership to 96 acres - above the 80-acre minimum to establish a single family residence within the Forest Production District, making the tract attractive to "family forest" owners who tend to be more focused on a combination of timber production and secondary forestry benefits.[3] This could greatly increase the pool of interested buyers for this tract. This acreage also abuts the Wagner/Erickson property on the east and south and is accessible from the Wagner/Erickson property, potentially making this acreage of interest to Erickson as well.

The 6 acres of **Type 6**, in the SW corner of the property, is another 37 year-old, fully stocked Douglas-fir plantation, which is isolated from the remainder of the property by the wetland complex. It has good road access off the Black Diamond-Ravensdale Road, but It is also adjacent to part of the Wagner/Erickson property, so may well be of interest to this party, or would be a great addition, along with the wetland complex, to the Black Diamond Natural Area.

This leaves only the ~22-acre northern portion of the recently filled, to-be capped and alder-planted stand (**Type 4-north**). Finding buyers for this piece may be a challenge. Including it with the Type 2/Type 1 parcel may be the best marketing option.

In conclusion***, given a willingness to market the property in large pieces following forestry reclamation work, there should not be major issues in finding viable, interested and willing buyers for the portions of the property located outside of the cement kiln dust disposal and remediation areas.***

2.11 Conclusions: Reclamation for Forestry

The data does not support Reserve's foundational assertion that it would be impractical to reclaim the property to a point where it could support viable stands of commercial timber.

Our analysis, based on data and recommendations from Reserve's consultants, would indicate the forest reclamation costs to reclaim 70% of the property for forestry to be on the order of $70,000; and the net stumpage value available from harvesting the existing merchantable Douglas-fir plantation on the property would be on the order of $400,000 - implying a net income from the timber harvest and forest reclamation of ~$330,000. The estimated net value to Reserve if they can gain approval for the upzone and 72-unit development is on the order of $1,700,000. In all likelihood, Reserve's primary motivation in pushing the upzone and development proposal is not to avoid high reclamation costs, as they contend, but to realize the windfall from selling residential lots to a developer.

With the recommended forestry reclamation, this property would fully meet GMA and King County's definition of 'forest land of long-term commercial significance'. Recognizing Reserve's desire to divest of this property, we anticipate very viable markets for this property, if it is sold in large (>80 acre) blocks.

3.0 WHAT ARE THE ENVIRONMENTAL RISKS AND HUMAN HEALTH HAZARDS ON THE PROPERTY?

3.1 Executive Summary: Health and Environmental Concerns

Several health and environmental issues associated with the Reserve Silica property raise serious concerns with respect to siting a 72-unit rural community on the property. As of January 2016, this site was ranked as a priority 1 MTCA cleanup site.* Chief among the site hazards is the Cement Kiln Dust (CKD) that was disposed of on the site from 1979 to 1989. Two unlined pits containing ~350,000 tons of CKD have been capped, and are being monitored. However, monitoring in 2007 showed leachate with extremely high pH, arsenic and lead levels escaping from the lower pit. Ongoing efforts to control this leachate since 2007 have been unsuccessful. The Washington Department of Ecology (WDOE) has concluded that soil, surface water, and shallow and bedrock groundwater aquifers are contaminated.

The WDOE's January 2016 Site Hazard Assessment identified the risk to Human Health as extremely high (4.4 on a 1-5 scale). Measurements of water leaching from the site in April 2016 were found to have pH levels in excess of 12.0, high enough to potentially cause physical harm to people and animals coming into contact with it. Contaminated ground and surface water has already migrated off-site, beyond the control structures, and is now within 800' of Ravensdale Lake and Ravensdale Creek. WDOE scored the Migration Potential of the contaminated groundwater at the highest rating possible.

Reserve's proposal calls for the CKD pits to be included as open space lands, and managed by the Homeowners' Association. The HOA would also be responsible for reclamation and management of the 211-acre "managed forest," which includes the area highly contaminated by CKD leachate and the structures intended to contain and control this contamination source. It is totally unrealistic to expect the HOA to have the expertise or financial wherewithal to manage these highly technical issues. And as proposed by Reserve, the Conservation Easement to be owned by King County would put King County in a position of responsibility for management of these hazardous waste leachate areas as well.

Reserve's solution to protect future residents from this known CKD risk is "*institutional controls such as fencing and signage.*" Common sense would say this is an ineffective means to avoid human contact with these known toxins, particularly in light of the numerous children who would be living in close proximity, not to mention exposure risks to the HOA representatives who would be tasked with overseeing and managing these hazardous lands under the provisions of Reserve Silica's proposal.

Reserve proposes the use of on-site septic systems, and public water provided by Covington Water District sourced from off-site wells. The additional 10 million-plus gallons of groundwater flow introduced through septic drainfields from a 72-unit rural community, directly above and as little as 400' distant from the capped CKD pits, will only add to existing groundwater and surface water contamination problems, making effective control even more difficult.

While WDOE has tested for arsenic, lead, manganese and potassium in the CKD contaminated soil, surface and groundwater, studies have shown many other toxic chemicals are commonly associated with CKD, including highly carcinogenic dioxins and furans. No testing for the presence of these highly toxic substances has been performed. Evidence also exists to suspect the possible presence of many other contaminants on the property, besides CKD. No testing has been performed for contaminants outside the capped CKD pits and the leachate control area below the lower pit. In addition, portions of the property are known to be underlain with coal mines that operated from the 1920s to 1940s.

Potential subsidence risk, as well as open portals, bore holes, air shafts, etc. pose additional physical risks to any development or persons on this site.

In summary***, the known hazardous CKD wastes, and their documented contamination of soil, surface and groundwater, is an uncontrolled and on-going problem. This poses serious human health and environmental risks, both on-site and off. Adding incremental waste water from 72 new houses, directly above and in close proximity to the capped CKD pits can only exacerbate the CKD contamination problem, and complicate the thus-far unsuccessful attempts to control this toxic source. And a much more thorough testing of the property for other toxins and risk factors, in other locations beyond the known CKD pits, should be mandatory before any residential use of this site whatsoever even be considered.***

*Washington Department of Ecology, Model Toxics Control Act: highest hazard ranking for potential risk to human health and environment.

3.2 What are the Environmental Risks and Human Health Hazards at the Ravensdale Reserve Silica Site?

Environmental risks and human health hazards are major concerns with the Reserve Silica property in Ravensdale. There are known hazardous wastes on the property from which contaminants are leaching, and which are still not controlled despite nearly 14 years of effort.[1,2,3] And there are potentially other risk factors with a significant likelihood of occurrence on this site for which tests and studies have not yet been conducted. Underscoring the seriousness of these concerns is the Washington Department of Ecology (WDOE) ranking of the site, effective January 26, 2016, as a highest priority, Level 1 MTCA[4] clean-up site[5] for potential threat to human health and the environment relative to all other Washington State sites assessed to this time.[6] This ranking is based on assessment of known contaminants on a portion of the site.[7] A full site assessment to identify other potential hazards has not yet been conducted.

3.3 Cement Kiln Dust (CKD)

For a description of Cement Kiln Dust, see Appendix 3-a What is Cement Kiln Dust?

One known hazardous waste present on the Reserve Silica site is cement kiln dust, or CKD. CKD is the extremely fine dust, or ash, that is collected in the stacks and pollution control filters of cement kilns. (See Appx 3-a "What is Cement Kiln Dust?".) While "dust" may sound relatively benign, CKD is actually an extremely caustic, alkaline substance with pH commonly in the range of 10.5-12.5[1] or greater.[2] CKD from the Ideal Cement plant in Seattle, the source of the CKD dumped at the Ravensdale site has been measured at a pH of 12.8.[3] Contact with the dust, particularly when wet, can cause serious burns, as happened to two young men who came into contact with CKD mud along one of the roads on the Ravensdale site in 1981 after losing control of their four-wheeler. The severity of their burns put them both in the Harborview burn unit.[4]

When this highly alkaline substance comes into contact with water, the resulting leachate (i.e., the contaminated water seeping from the substance) is characterized "*as a Resource Conservation and Recovery Act (RCRA) corrosive waste . . . with pH levels commonly in excess of 12.5.*"[5] Leachate at the Ravensdale Reserve Silica site measured at two collection points in 2015 showed pH levels of 12.53 and 13.02.[6] On April 27, 2016, measurements of pH at five sampling points around the leachate collection and infiltration area ranged from 12.48 to 12.86.[7] Besides the pH issues associated with CKD, the other health and environmental risk is the presence of toxins including heavy metals and organic by-products. The US Environmental Protection Agency's (EPA's) analysis of CKD dust solids and leachate chemistry identified CKD as *"potentially contributing concentrations of arsenic, thallium, antimony, lead, chromium, total-2,3,7,8-substituted dioxins, and total hexachlorodibenzodioxin"*[8,9,10] to the environment. Other studies have also indicated the presence of furans in CKD.[11] These toxins are derived from both the feedstock materials used in the manufacture of cement and the fuel sources used to fire the kilns,[12] as well as from the combustion of these materials together in the kiln, which creates new compounds.[13,14] Besides the use of oil, natural gas and coal as primary fuel sources, tires and other organic wastes have also been used as fuel sources for heating kilns.[15] The extremely high temperatures in cement kilns (some of the highest temperatures of any industrial process), enable these kilns to

basically operate as waste incinerators, capable of burning most anything as fuel including municipal wastes, industrial wastes, medical wastes, etc.; as such, these kilns have been used as a means to dispose of these unwanted and undesirable materials.[16] Studies have shown extremely carcinogenic dioxins and furans are commonly associated with CKD when organic materials such as tires and medical wastes were used as a supplemental fuel sources in the cement kilns.[17,18] It is known that the Ideal Cement plant in Seattle (later Holnam Cement, then Holcim), the source of the CKD dumped at the Ravensdale site, burned ground tires as a supplemental fuel source for a period of time starting in 1986, and then again into the 1990s.[19] Holnam Cement is also known to have conducted several test burns using medical wastes as a fuel source.[20] However, it is unknown if this may have occurred during the period their CKD was being dumped at the Ravensdale site.

3.3a CKD on the Reserve Silica Property

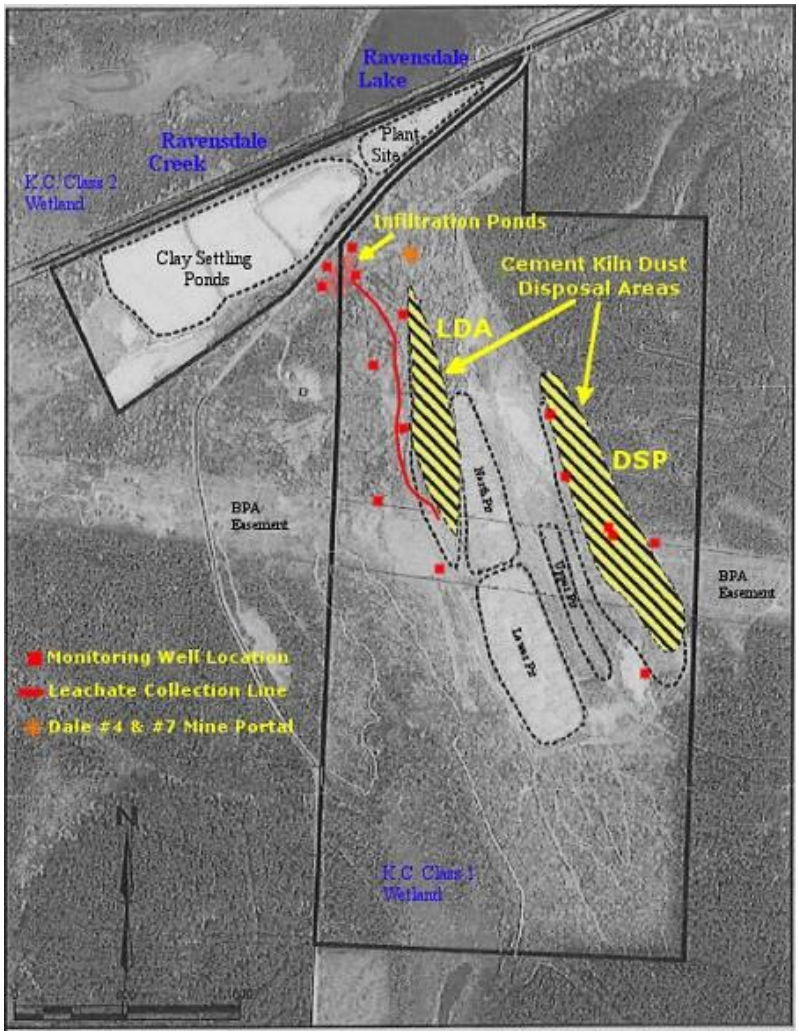
It is known that Reserve's predecessor, Industrial Mineral Products (IMP), and Reserve's own wholly owned subsidiary, L-Bar Products, Inc., disposed of CKD from the Ideal Cement plant in Seattle on the Ravensdale site from 1979 to 1989.[21] IMP sold silica sand (and ASARCO slag) to Ideal Cement for use in cement manufacturing and in turn, Ideal Cement disposed of CKD from their Seattle plant at the Ravensdale site.[22] Disposal of CKD in the unlined Lower Disposal Area (LDA) on the Ravensdale site began in June 1979.[23,24,25] This continued through 1982,[26] then disposal of CKD moved to the unlined Dale Strip Pit (DSP) and continued until 1989.[27,28] IMP oversaw dumping until 1986 when IMP was bought out by Reserve Industries, which then managed the site through its subsidiary, L-Bar Products, Inc.[29] L-Bar oversaw the disposal of CKD on the site from 1986 until 1989.[30] The estimated volumes of these known CKD deposits are 80,000 cubic yards (175,000 tons) in the LDA, and 83,000 cubic yards (182,000 tons) in the DSP.[31] However, in their January 2016 Site Assessment, under the heading "Current Site Conditions", Washington Department of Ecology (WDOE) states that "CKD might be present in other locations" [besides the LDA and the DSP].[32]

In 2002, Reserve Silica entered into an agreement with Holcim (USA) Inc., successor to Ideal Cement/Holnam Cement, the source of the CKD, for maintenance and monitoring by Holcim of the now capped CKD dump areas.[33,34]

3.3b Current Condition of Known CKD Deposits

The LDA was closed to all forms of dumping in 1985, and the DSP in 2003.[35] Both areas have now been capped with clay and soil to minimize surface water penetration. Thirteen groundwater monitoring wells have been established on the property, plus two additional on the adjacent property to the west, to measure the levels of pH, arsenic, lead, and manganese leaching from these CKD disposal areas. In addition, there are four surface water monitoring sites, including the infiltration ponds that cover about 1/10-acre on the adjacent property where CKD leachate is allowed to soak into the ground. And lastly, there is a monitoring point at the collapsed portal of the old underground coal mine shaft located below the DSP for testing of ground water seeping from the former mine tunnels. Regular monitoring of these wells and surface water sites has been conducted since 2005.[36]

When monitoring showed leachate problems at the LDA, the soil cap was upgraded in 2007,[37] the cover re-graded, and a surface water diversion ditch was constructed in 2007 to try to control surface water infiltration into the CKD.[38] When these measures failed to control leaching from the LDA, WDOE concluded that the primary cause of seepage was from groundwater flowing into the disposal area, rather than surface water infiltration. Between 2008 and 2013, a trench system was installed to collect the seepage from the LDA and direct it to infiltration ponds partially located on Reserve property and partially on the adjacent neighboring property.[39] WDOE studies concluded that the bedrock aquifer groundwater was rising at a vertical upgradient beneath the LDA, mixing with the shallow groundwater aquifer, flowing through the CKD, and then mixing back into the bedrock aquifer at a vertical downgradient beneath the LDA before flowing north and northwestward offsite. Groundwater in the LDA also discharges to the surface, where it comingles with storm water, before flowing into the three infiltration ponds.[40]



Cement kiln dust contaminate monitoring wells and leachate collection and infiltration facilities. (WDOE Water Quality Program. Recommendation for Enforcement Action. June 21, 2016. Original map base: Reserve Silica Ravensdale Quarry SWPPPS Map prepared by Bennett Consulting, PLLC, June 25, 2009.)

The problem of uncontrolled leachate was reported in a 2014 King County Public Health Department inspection report noting that leachate with a pH 11 to 12 was "*escaping/exiting the hillside north and downslope of the installed leachate catch basin. The volume of leachate appears significant and is not entering the system installed for conveying leachate to the downslope infiltration ponds.*"[41] This assessment is reinforced by Reserve's environmental and geologic engineering consultant, GeoEngineers' statement, "*Although the LDA and Dale Strip Pit have been capped ……, leachate from the LDA and Dale Strip Pits continue to present an environmental concern for impacts to groundwater, soil, and the exposure to leachate. Leachate (in the form of surface water) is seeping out of the west side of the LDA, and west of the LDA into collection ditches, which fall outside of the conveyance infrastructure in the marsh areas, the south pond area, and in the infiltration ponds. Although the conveyance and*

WA Department of Ecology monitoring photo: "Sample collection point, southwest corner of infiltration pond #1. Note "skin"/"film" related to elevated pH." (WDOE Water Quality Program. Recommendation for Enforcement Action. June 21, 2016.)

infiltration facilities are in place, the capture of leachate within collection ditching and inlet infrastructure has not been reliable. The uncontrolled nature of the leachate and impacted surface waters result in exposure pathways impacting human health and the environment that could be an ongoing concern depending on future land use type."[42]

2015 surface and groundwater monitoring for pH, arsenic, lead and manganese showed extremely high pH levels in surface waters around the LDA, and significantly elevated pH levels in the two shallow groundwater wells on the neighboring property (below the seepage collection trench and infiltration ponds). Arsenic concentrations exceeded Model Toxics Control Act (MTCA) cleanup levels near the LDA, found to be 7 to 30 times the designated cleanup levels in the surface waters; up to 8 times cleanup levels in the shallow groundwater in the off-site wells; and up to 2 times cleanup levels in the bedrock groundwater. Lead showed as exceeding cleanup levels in only one surface water test, and manganese did not exceed cleanup levels in any 2015 test (though reportedly, manganese levels have been significantly higher in earlier tests). At the DSP, two bedrock groundwater wells beneath the DSP showed arsenic levels exceeding cleanup levels by as much as 2.6 times.[43]

April 2016 measurements of pH levels by WDOE Water Quality again confirmed the presence of extremely high pH in the leachate collected from the LDA.[44] These findings led to the issuance of a WDOE Notice of Violation on June 29, 2016 for pH readings exceeding 12 at times and routinely exceeding the standards set in Reserve Silica's permit and in WAC Chapter 173-200.[45] The measured pH levels are described as "*high enough to potentially cause physical harm to people who contact the caustic discharge.*"[46] The Notice of Violation goes on to state, "*There is a potential for humans, particularly children, coming in contact with the* [leachate infiltration] pond *as the current fencing in not entirely prohibitive.*"[47]

WA Department of Ecology monitoring photo: "Description: pH meter reading of hard-pipe discharge [i.e., leachate discharging from collection system]. (WDOE Water Quality Program. Recommendation for Enforcement Action. June 21, 2016.)

These monitoring results would indicate that the toxic leachate associated with the CKD, especially in the LDA, is as yet uncontrolled, having now extended beyond the seepage collection trench and infiltration ponds that were installed as recently as 2013, and is affecting the adjacent property.[48] This indicates the contaminated ground water has migrated something more than 800' within the past nine years, and is now something less than 800' distant from Ravensdale Lake and Ravensdale Creek. The DOE has

noted the subsurface geology in this area to be "*Sand and gravel, fractures in bedrock*",[49] and scored the Migration Potential of the contaminated groundwater at the highest rating possible.[50] The extensive subsurface water flow through this area has been documented by other studies as well.[51] As such, the risk to Ravensdale Creek and Lake Sawyer would seem substantial and imminent. (WDOE believes the CKD leachate does not pose a risk to Ravensdale Lake at this time as they believe the Lake to be up-gradient from the CKD disposal areas.[52])

The Washington Department of Ecology's January 2016 Site Hazard Assessment evaluation found ground water to be in direct contact with the CKD fill, and the site to be contaminated with arsenic and lead.[53] Based on the January 2016 findings, WDOE classified the site as Class 1 (on a scale where 1 represents the highest relative risk and 5 the lowest) MTCA toxic cleanup site.[54] This classification represents, "*an estimation of the potential threat to human health and/or the environment relative to all other Washington state sites assessed at this time.*"[55] Underpinning this WDOE classification was their rating of risk to Human Health as 4.4 (on a scale of 1 – 5, where 5 is the highest possible risk.)[56]

In addition, the 1996 study completed by Hart Crowser for the City of Kent Wellhead Protection Program identifies the ground downslope of the CKD disposal areas, and beneath the CKD infiltration ponds and two lower monitoring wells, as Vashon Recessional Outwash. This is a highly permeable geology, rated High for Aquifer Susceptibility, with high (600' - 1000'/day) hydraulic conductivity, and within the 5-Year Capture Zone of the Kent Springs/Lake Sawyer Wellhead Protection Area, and upgradient from the Kent Springs and the Covington Soos Creek Well Field.[57]

In conclusion, the 350,000 tons of CKD dumped into unlined pits on the property through the 1980s have now contaminated the soil, ground and surface waters with extremely caustic pH levels and extremely high levels of heavy metals, especially arsenic. In spite of fourteen years of effort to control this contamination source, the toxins continue to migrate, having now spread off-site. Future contamination of nearby public 'waters of the State' seems likely. Contact with contaminated surface waters pose a serious risk to human health.

3.4 Limitations of Past Testing and Monitoring

The CKD monitoring wells have identified groundwater contamination in the vicinity of the CKD pits, but Reserve Silica's consultant, GeoEngineers, points out that "*an investigation or conclusion around impacted groundwater limits* [i.e., the extent of this contamination]*, was not identified during this* [GeoEngineers] *environmental review, which is a potential environmental concern.*"[1]

Review of available records suggests no testing has been done on this property for toxins other than arsenic, lead and manganese (and some tests for potassium), a conclusion confirmed in comments made by WDOE staff,[2] even though numerous other toxins are known to be commonly associated with CKD, including extremely carcinogenic dioxins and furans, especially when organic materials such as tires and medical wastes were used as a supplemental fuel sources in the cement kilns generating the CKD.[3,4] It is known that the Seattle Ideal/Holnam Cement plant, the source of the known CKD dumped at Ravensdale between 1979 and 1989, used tires as a fuel source for a period beginning in 1986.[5] (This

cement plant also tested the use of medical wastes as a fuel source, though the exact time period when this testing occurred has not been discovered.[6])

While the CKD issue on this property has been well documented and continues to be studied, other potential toxins have not been investigated at all.

In addition to the CKD, other extensive filling activities have occurred on the site since at least 1971.[7,8] Prior to IMP's acquisition of the site lease in 1972,[9] the property had been used for the mining of coal from 1925[10] to 1946,[11] both via underground mine tunnels and surface strip mining. There were no documented mining activities on the site from 1947 to 1967,[12] but since 1967 the site has been used for open pit mining of silica sand.

The property has also operated as a fill site since the 1970s,[13] through backfilling of the mining pits with known and unknown materials. Filling operations were initially permitted under a grading permit issued by the KC DDES.[14] Solid waste permits were issued by Seattle King County Public Health in 1983 and 1987,[15] which allowed dumping on the site consistent with a landfill. Finally, in 2012, SKC Public Health issued an Inert Waste Disposal Permit that specified only soil material free of contaminants, radioactive and hazardous wastes could be dumped on the site.[16] Prior to issuance and monitoring of the inert waste permit in 2012, it is unknown what other waste materials may have been dumped at the site. In its January 2016 Site Hazard Assessment, WDOE states that other mining pits on the site were filled with unknown materials.[17]

GeoEngineers reports "*Potential contaminant sources other than CKD, have not been investigated based on the information provided for this environmental review, and remains a data gap.*"[18] And "*Due to the limited sampling locations and analysis included in the current water quality monitoring program, other potential sources and/or recognized environmental conditions have not been evaluated. Therefore, it is possible that surface and groundwater quality may present a risk to human health and the environment, which may dictate opportunities for future use of the property.*"[19] Washington Department of Ecology points out in their January 2016 Site Hazard Assessment that "*Additional sand-mining pits, ….. which were filled with unknown materials not expected to be CKD, are located on other portions of the property.*"[20] Reserve Silica's Environmental consultant, GeoEngineers, reports that the Environmental Data Resources report in the 'Phase I ESA' [Environmental Site Assessment] showed the property was "*listed as a landfill until December 1999; has suspected groundwater, soil, and surface water contamination by metals and corrosive waste, and had an industrial wastewater discharge permit as of September 1994.*"[21] The GeoEngineers' report also referenced 20 environmental violations on the subject property from 2002 – 2006, which were all shown as "closed"; however, no information on these violations was provided to the consultant for their evaluation of potential environmental impacts to the future use of the property.[22]

More recently, Reserve Silica was cited for a major violation in December 2012 when it was discovered by WDOE personnel that up to eight truckloads of highly alkaline material containing "soil conditioners/ drilling additives and lube oil"[23] had been delivered to the Ravensdale site by Seattle Tunnel Partners.

Testing of the material indicated pH levels between 10 and 12, far above the levels allowed in Reserve's Inert Waste Landfill Permit issued in July 2012 and by State law. Not only was the material far above the allowable pH limit, but WDOE was told that the material was being treated on site (i.e., at the Reserve Silica Ravensdale fill site where it had been dumped) with concentrated sulfuric acid in an attempt to neutralize the material. Apparently, the acid was being poured on the highly alkaline material, then mixed together using heavy equipment before being pushed into one of the mine pits. WDOE found some portions of the "mixed" material to still have a pH of over 11 while pools of unmixed acid had a pH of less that 1. WDOE personnel also noted during the same visit the presence of petroleum sheen on dirt and standing puddles of water – a separate violation of Reserve's permit.[24]

In spite of a very long, largely undocumented history of dumping on this site, no testing for other industrial wastes or contaminates on other areas of the property has occurred. But evidence of such contamination has been reported to the WDOE involving old air shafts above mine tunnels[25] as well as on the 53-acre portion of the property where the processing plant, equipment storage, and clay settling ponds are located.[26] The Reserve Silica development proposal calls for putting the processing plant area into forest but the potential for site contamination following years of use as an industrial site, starting with the Dale/Continental Coal Company coal processing facility in 1924, and continuing to the present day, is high. This portion of the property is on the banks of Ravensdale Lake and Ravensdale Creek, separated only by the width of the Burlington Northern-Santa Fe rail line.

In conclusion, this site has had a very long, and largely undocumented history of dumping. Testing for likely contaminants has been limited to a very small area of the property associated with the known CKD pits and the CKD remediation area, and has been limited to just a few of the toxins known to be commonly associated with CKD. Testing for dioxins and furans in the CKD areas, and a broader-based testing across other areas of this property should occur prior to approval of any development.

3.5 Other Potential Contaminants

3.5a Unknown Fill Materials

In addition to the CKD, other extensive filling activities have occurred on the site since at least 1971.[1,2] Prior to IMP's acquisition of the site lease in 1972,[3] the property had been used for the mining of coal from 1925[4] to 1946,[5] both via underground mine tunnels and surface strip mining. There were no documented mining activities on the site from 1947 to 1967,[6] but since 1967 the site has been used for open pit mining of silica sand.

The property has also operated as a fill site since the 1970s,[7] through backfilling of the mining pits with known and unknown materials. Filling operations were initially permitted under a grading permit issued by the KC DDES.[8] Solid waste permits were issued by Seattle King County Public Health in 1983 and 1987,[9] which allowed dumping on the site consistent with a landfill. Finally, in 2012, SKC Public Health issued an Inert Waste Disposal Permit that specified only soil material free of contaminants, radioactive and hazardous wastes could be dumped on the site.[10] Prior to issuance and monitoring of the inert waste permit in 2012, it is unknown what other waste materials may have been dumped at the site. In

its January 2016 Site Hazard Assessment, WDOE states that other mining pits on the site were filled with unknown materials.[11]

3.5b Permitted Fill

GeoEngineers points out that "*Without reasonable estimates of the volumes, locations, and makeup of strip mine backfill accepted prior to the 2012 Inert Waste Disposal Permit, the significance and extent of this contamination remains a data gap in evaluating impacts to the Subject Property.*"[12] Furthermore, under Reserve's current fill permits "*it is reasonable to assume waste with contamination concentrations up to the MTCA thresholds may have been used as fill. Soil accepted from the Highway 99 tunneling project, and other development sites in downtown Seattle represent this type of fill material that may contain contaminant concentrations up to the MTCA reporting limits. The cumulative result of using fill impacted by contamination concentrations less than MTCA reporting limits is a potential environmental concern due to soil exposure and groundwater impacts …*"[13] In other words, the cumulative impact of permitted fill below MTCA thresholds, particularly with exposure to soil and groundwater, could represent a significant environmental risk factor [i.e.: Individual truck loads of fill material may be below the MTCA limits, but the total concentration of contaminants from many, many loads being dumped together in the same location is unknown].

3.5c ASARCO Slag Road Ballast and/or Gravel

Industrial Mineral Products (IMP), headquartered in Ravensdale (see Section 6.5 *Who Was Industrial Mineral Products?* and Appendix 3-b *What is Copper Slag?*), was mining silica sand from what is now the Reserve Silica site from 1972 until 1986, at which time Reserve Industries bought out the assets of IMP. IMP also had a contract, through its subsidiary, Black Knight, Inc., to purchase copper slag from the ASARCO smelter in Tacoma.[14,15] From about 1973 through 1985 (when the ASARCO smelter closed, IMP ground and sold the copper slag as road ballast, fill material, driveway gravel, roofing granules, sand blasting grit, and feedstock for cement manufacture. In addition to high levels of arsenic, ASARCO slag was found to have a number of other heavy metals including lead, copper, and cadmium.[16,17,18] In 1986, the Washington State Health Department determined that besides these contaminants, ASARCO slag also contained radium.[19] Copper slag road ballast used in the log sort yards and other locations in and around the Port of Tacoma led to extensive contamination of these areas .[20]

Given IMP's widespread sales of ASARCO slag-based road ballast and other materials throughout the Puget Sound region through the 1970s and early 1980s, it would seem highly likely that IMP also utilized this material on the roads at their own Ravensdale silica sand mining operation. In a trip report from a 1983 visit to the Ravensdale site by Greg Wingard, he indicates that two samples of this slag material were picked up from the main road serving the mine pit area and provided to WDOE for testing.[21] However, WDOE was unable to locate any of these test results in response to a Public Records Request in 2013. However, Mr. Wingard recalls that the samples had been sent to WDOE's Manchester Laboratory, and results provided to both he and the WDOE at the time indicated the samples were "very high in arsenic, and the data confirmed that the slag was from ASARCO." [22] Further, a report filed with the WDOE in 2004 included a statement from a Reserve Silica employee stating "*I worked at the reserve Mineral plant in the Ravensdale area for approximately 5 years. I was told by older workers that ballast*

was hauled in from Asarco smelter and dumped on the premises ….."[23] However, the WDOE Site Hazard Assessment from January 2016 did not test for, nor address, this potential environmental and human health hazard.

3.5d Petroleum-based Contaminants

In his 1983 trip report to the Ravensdale site, Greg Wingard recorded observing a "rainbow sheen" on surface waters over a wide area near the mine pits on the site,[24] indicating possible petroleum-based contaminants. Reinforcing this possibility is the written employee statement included in a 2004 report to WDOE in which the employee stated, "*I was there and saw transmission fluid from heavy equipment being dumped within 100 feet of the lake by the mechanic, this has been reported many times over the years with no results."*[25] The property should be tested for petroleum-based product contamination.

3.5e Coal Tailings Contaminants

Reserve's environmental consultant, GeoEngineers noted that the ~10 acre coal tailings area on the north end of the property may be contaminated "*by heavy metals, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and other associated contaminants* ".[26] Given the close proximity of this area to Ravensdale Lake, testing for these toxins should be performed.

3.5f SR 520 Evergreen Point Floating Bridge Demolition

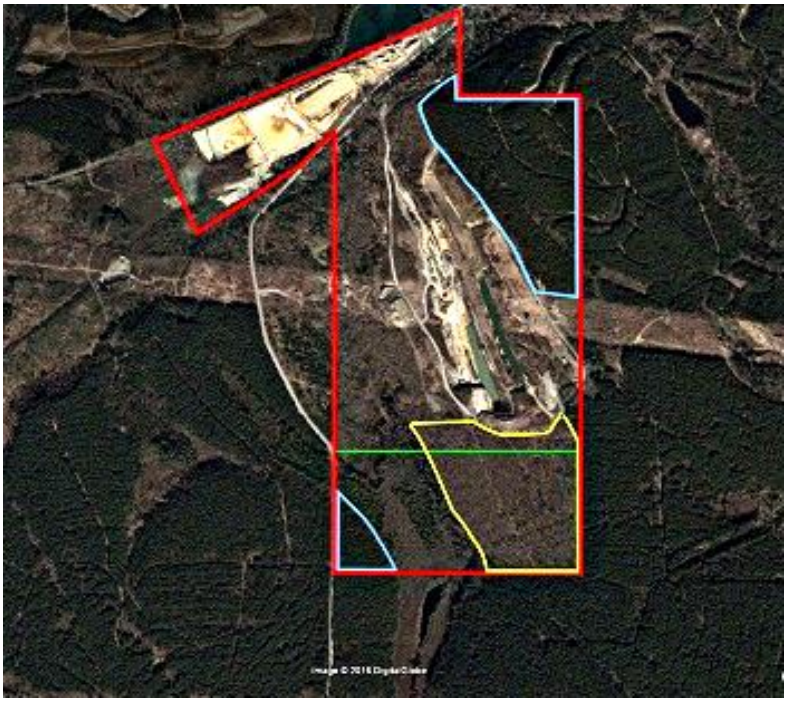
Reserve Silica's Ravensdale site has been approved by King County as the disposal site for concrete debris from the demolition of the SR 520 Evergreen Point Floating Bridge on Lake Washington.[1] Much controversy has surrounded the demolition in terms of where the demolition should occur, whether on barges in Lake Washington or at the KGM (Kiewit/General/Manson) site in Kenmore. This controversy is due to concerns about noise, dust, and the potential release of hazardous materials and toxins by the pulverizing of the concrete.[2] In addition to the contaminants typically found in concrete, there is added concern for the presence of asbestos from automotive brakes.[3]

Newspaper reports on the controversy end with the statement that, regardless of where the demolition work takes place, the concrete material will be loaded on trucks and taken "out of the city." That 'out of the city' location is the Reserve Silica site in Ravensdale. While this is just one more source of potentially hazardous waste to be disposed of on this site, the unknown potential for leaching of toxins from the material if dumped in the unlined Ravensdale mine pits is unknown. Of particular concern is the actual composition of the concrete material given that it was produced in the 1960s before heightened awareness and monitoring of contaminants in cement and other additives to the concrete. And if the material does contain elevated levels of asbestos, there is a question if the proposed 1' to 2' covering of soil[4] over the disposal area will be adequate to contain this material and prevent exposure of any future residents to this highly carcinogenic material, particularly given Reserve's proposal that portions of the filled pits be used for recreational activities including trails and a possible equestrian facility.

3.5g Was Industrial Waste "Fertilizer" Applied to Portions of the Site?

Reserve Industries' subsidiary, L-Bar Products, which operated the Ravensdale site from 1986 to ca. 1990, also operated a magnesium recovery plant in Chewelah, Washington. (See 6.3 Who Was L-Bar Products, Inc.?) L-Bar Products sold the waste material from this magnesium recovery plant as both a road deicer and as an agricultural fertilizer. This fertilizer was found to contain a number of toxic materials and a study ultimately characterized it as volatile, unpredictable, unsafe, and hazardous to farmland;[1,2,3] but not before it was widely sold and used on croplands in Eastern Washington and the Willamette Valley between 1986 and 1991. In addition, since 1987, Ideal/Holnam Cement sold a majority of its cement kiln dust (the same material being dumped at the Ravensdale site) as a liming agent/fertilizer for agricultural use in Western Washington.[4,5,6] And lastly, Industrial Mineral Products (IMP), operator of the Ravensdale site from 1972 to 1986, and of the Chewelah magnesium recovery plant prior to L-Bar, was also attempting to market waste materials from the Chewelah plant as fertilizer, even to the point of asking the Washington State University's agricultural experiment station in Puyallup to do testing of their fertilizer product for use in Western Washington.[7,8] (WSU declined to test the material.)

It is not known if any of the L-Bar/IMP fertilizer products or Ideal/Holnam Cement's agricultural liming products were delivered to or used on the Ravensdale site; however, such a possibility cannot be overlooked as these companies sought new uses and markets for sale of these waste products – perhaps even as a forest fertilizer. L-Bar's marketing of their agricultural fertilizers in Eastern Washington and the Willamette Valley between 1986 and 1991 coincide with the time when L-Bar was also operating the Ravensdale site. It is possible that some or all of these products could have been tested on forestlands on the Ravensdale site in an effort to prove a forestry use for these materials.



April 2002 Google Earth image showing the dramatic vegetation difference between the heavily timbered northeast and southwest areas (highlighted in blue) and the southern portion upland of the wetlands (highlighted in yellow). Also note the heavily timbered lands surrounding the Reserve Silica property that were harvested and replanted by BN Timberlands at about the same time as the timber stands of the Reserve property. The lands below the green line and to the east are zoned Forest and located within the Forest Production District. (Google Earth, ©2016.)

An indication of such possible testing is the markedly different timber conditions between stands in the northeast and southwest of the property (AFM Types 2 and 6, see Section 2.2, Figure 1) and the stand between these on the south end of the property (AFM Type 7).

Aerial photography from 1981 shows this entire area, along with the surrounding properties (all were owned by Burlington Northern Timberlands [BNT]at the time), to be heavily timbered with conifers. Aerial photography from 1983 indicates this entire area was clearcut harvested at the same time, likely in 1982. BNT practices at the time were to replant their clearcuts with Douglas-fir within one year of harvest – which is consistent with the conifer timber we observe on Types 2 and 6 today, as well as the timber that has been recently harvested from the adjacent properties. And yet today's timber on Type 7 has virtually no conifer surviving, and is instead predominantly big leaf maple and cottonwood, with a little alder.

What's to explain this apparent anomaly? Reserve reports they have done no forestry activity of any kind on any of their property. They did report some mining exploratory work in this area, but it doesn't seem realistic that this exploratory work would have killed ALL the conifer, and spared the hardwoods. And it seems highly unlikely that BNT would have skipped planting this portion of their ownership, or treated it differently from their surrounding property, particularly where this area was still zoned Forestry, was still included within the Forest Production District, and the silica sand mining lease was not encroaching on this area of the property.

Could a test application of IMP/L-Bar's magnesium industrial waste 'fertilizer' on this area be the explanation? Testing of the impacts of this fertilizer on Eastern Washington and Willamette Valley agricultural applications showed occasional extensive crop mortality (and even major health issues in animals who consumed the crops) and major long-term reductions in soil productivity – particularly where the soil pH was allowed to drop following fertilizer application.[9,10] In Western Washington, with its heavy rainfall (compared to Eastern Washington), the tendency is for soil pH to drop (become more acidic) over time. So it would seem plausible that a test application of the industrial waste as a forest fertilizer may have killed the conifers, leaving the naturally regenerating hardwoods to take over the site. And if they were trying to test the fertilizer, the Type 7 area is the logical place to test, as this portion of the property has good access and reasonable topography, and the adjacent Type 2 stand would serve as a 'control' for the test. And Reserve's consultant (IFC) remarked on the unusual absence of any second-growth stumps in this area. Some of the chemicals in the industrial waste fertilizer would be expected to accelerate decomposition of woody fiber.

This is all just circumstantial evidence, but it would seem highly plausible that IMP and/or L-Bar may have tested their industrial waste fertilizer on the young Douglas-fir plantation in an attempt to demonstrate the value of the product to augment forest growth. And the test failed, killing the conifers, just as L-Bar's products were found to be devastating to some agricultural crops. This is the best explanation we can come up with to explain the anomaly in the timber mix we see today on Type 7 versus Type 2 & 6 stands. Though circumstantial and speculative, it would seem there is sufficient evidence to justify testing this area of the property for toxins found to be associated with the industrial waste fertilizer IMP/L-Bar was marketing at the time, as well as the CKD 'liming agent' Ideal Cement was marketing.

3.6 Physical and Subsidence Risks

Portions of the property were mined for coal through underground shafts and tunnels from 1924 to 1946.[1] "*The primary hazards associated with underground coal mines are open adits or portals, sinkholes, and ground surface settlement.*"[2] A March 2012 Projected Land Use Classification study prepared for Reserve Silica mentions "*open mines and test mine pits …. In the forested areas*."[3] An open mine adit was also noted in a 1983 trip report to the site by Greg Wingard.[4] King County has mapped portions of this site as Coal Mine Hazard areas,[5] and GeoEngineers states that while underground chambers, adits and tunnels may have been closed or filled, the "*remaining uncompacted fill material and subsurface void space continues to present a subsidence risk. A Coal Mine Hazard Investigation or Assessment … is recommended* [by GeoEngineers] *to mitigate these subsidence risks prior to development.*"[6]

3.7 Risks to Human Health and the Environment Posed by Residential Development on the Site

3.7a Risks to Human Health

Obviously, the known and potential risk factors described above represent a serious risk to residential development on the site. Reserve's solution for the known CKD risk is "*institutional controls such as fencing and signage.*"[1] Common sense suggests that fencing and signage of the 20 acres of mowed, grassy fields over the CKD pits [required for the maintenance of the soil and clay caps on the CKD disposal areas], directly below and as little as 300' from 72 middle income households will not be an effective control measure. This is especially true given the high probability there will be many households with children. For curious, adventuresome children, fencing is likely to be little more than an enticing challenge to be overcome. And given that the highly caustic and toxic CKD leachate and storm water runoff from the site has already spread beyond the Reserve Silica property, how will contact with leachate beyond the perimeter of the property be prevented? The current proposal only calls for fencing the CKD pits.[2] Will potentially ever expanding areas of adjacent properties also have to be fenced to avoid human, and animal, contact with this dangerous material?

Reserve's proposal also calls for "*recreational opportunities for the residents on the property with the potential of an equestrian facility,*"[3] including pasture, stables and arenas.[4] And Reserve's proposal calls for the Homeowner's Association to "*be responsible for the long term protection of the open space* [including the capped hazardous waste sites]*, critical areas and managed forest* [including the uncapped hazardous waste remediation area]."[5,6] These recreational opportunities and homeowner management responsibilities present significant opportunities for public exposure to known and unknown toxins and other risks. And it is ludicrous to expect the homeowner's association to have the expertise to manage these complex, technical issues, or to have the funding to hire persons with the appropriate expertise to deal with these issues.

3.7b Environmental Risks from Development

Reserve has apparently recognized the folly of their 2012 proposal to rely on private wells for the development[7] given the known contamination of the shallow and bedrock aquifers under portions of

the property, and the unproven long-term, and as yet unsuccessful, ability of the capped, but unlined, CKD pits to contain toxic contaminants. The current proposal implies that Covington Water District will serve Reserves' proposed 72-home rural community.[8,9,10,11] If approved, this would necessitate extending this urban service an additional 1.5 miles into the rural area.

Reserve's plan also calls for the use of on-site septic systems as the site is not located within a sewer district.[12] This possibility raises the concern that the incremental waste water from this rural community, brought in from off-site by Covington Water and estimated to be over 10 million gallons per year,[13,14] and introduced into the groundwater as little as 400' distant and directly above the unlined CKD pits, could substantially exacerbate the as yet unsuccessful attempts to control the CKD ground water contamination, and possibly even accelerate migration of contaminated ground water towards Ravensdale Creek, and the Lake Sawyer/Green River basin as well as the Kent Springs and Covington Wellfield. This environmental concern was corroborated by DOE Water Quality program personnel.[15]

3.8 Conclusions: Health and Environmental Risks

This property has an unusually high level of environmental and human health risks.

Most notable is the 350,000 tons of CKD dumped into unlined pits on the property through the 1980s, which have now contaminated the soil, ground and surface waters with extremely caustic pH levels and extremely high levels of heavy metals, especially arsenic. In spite of fourteen years of effort to control this contamination source, the toxins continue to migrate, having now spread off-site. Contact with contaminated surface waters pose a serious risk to human health. And the increment to groundwater from the construction of a 72-unit development, on public water sourced from off-site, with on-site septic systems, in close proximity and directly above these unlined CKD pits, will likely pose an additional challenge to attempts to control this source of toxic contamination.

Finally, due to its long, and largely undocumented history of dumping on the property, there is a high probability of additional contaminants on the site, beyond the known CKD. In spite of this, there has been virtually no testing done to identify these likely risks.

Appendix 3-a What is Cement Kiln Dust?

Cement kiln dust is a fine powdery residue of ash collected from the stacks, flues, and air pollution control filters of cement kilns producing Portland cement, the basic ingredient in concrete products. The kiln dust contains elements of 1) the feedstock materials – the materials being heated and combined in the kiln to create the cement, 2) compounds in the fuel source materials – the materials being burned to heat the kiln, and 3) new compounds created in the extremely high temperature of the cement kiln.

Very simply, a cement kiln is a long, slightly inclined, rotating barrel, typically over 500' long in wet process kilns,[1,2] heated to extremely high temperatures by the burning of fuel source materials at the lower end of the barrel. Feedstock material is fed into the kiln at the upper end and slowly rotates and tumbles down the barrel towards the flame of the heat source. As the material moves closer and closer to the heat source, the chemical properties of the feedstock change and melt together to form a rock-like material called clinker, which drops out of the lower end of the kiln. This clinker is then mixed with gypsum and other materials and ground into the fine powder known as Portland cement.[3]

A portion of the 540 ft. long wet process kiln at Lafarge Seattle, formerly the Ideal/Holnam Cement plant. (pavementinteractive.org)

Feedstock materials to be fed into the kiln are crushed and mixed together into a product containing the appropriate amounts of the basic ingredients of lime, silica, alumina and iron oxide, plus other substances found in the source materials. The source materials for feedstock can come directly from mining operations of the raw materials, or from reprocessing waste products from other industries including blast furnace slag and steel slag[4] (and historically, copper smelting slag[5]).

A number of **fuel source** materials are used in cement kilns. Cement kilns operate at extreme temperatures, as high as 3,000° to 3,400° Fahrenheit, the hottest of industrial processes.[6,7] As such, they are capable of incinerating almost anything, leading to the use of a wide variety of fuel source materials in combination with the traditional fuel sources of coal, oil and natural gas. These supplemental fuel sources can include most any kind of industrial wastes, municipal wastes (garbage), organic hazardous wastes (e.g., solvents, paint thinners),[8] medical wastes, and whole or ground tires.[9,10]

Inside a cement kiln. (www.allwidewallpapers.com)

Traces of the elements contained in both the feedstock and the fuel source can be found in the cement kiln dust as a result of the combustion and heating of these elements together in the barrel of the cement kiln. The combustion ash and hot gases combine and are expelled from the upper

end of the kiln into air pollution control filters that collect the ash and gas particles while filtering air emissions from the stacks. Together, the ash and particulate residues collected from the air pollution filters are referred to as cement kiln dust.

Cement kiln dust is highly alkaline, measuring as high as 13 on the pH scale, and very corrosive.[11,12,13] Due to the highly caustic nature of cement kiln dust, contact with the skin can cause burns.[14] When mixed with water or with acids, cement kiln dust has been found to leach a wide range of toxic chemicals of varying, and somewhat unpredictable, composition, with variable rates and quantity of leaching over time, depending on a number of variables including the acidic level of the environment in which it is placed as well as the quantity and pH of surface and ground water or other substances flowing into and around the cement kiln dust.[15]

The most frequently reported hazardous leachates from cement kiln dust are arsenic and lead, but various studies, including a US Environmental Protection Agency analysis of cement kiln dust, have identified a variety of toxic constituents in both cement kiln dust solids and in the leachate including: arsenic, thallium, antimony, lead, chromium, and dioxins.[16,17,18,19] Other studies have also indicated the presence of furans.[20] The presence of dioxins and furans in cement kiln dust are primarily associated with the burning of organic compounds found in municipal wastes, medical wastes, and tires.[21,22,23] The leachates from cement kiln dust have been found to enter both ground water and surface water. In addition, water-cement kiln dust mixtures are defined as a corrosive waste under the Resource Conservation and Recovery Act (RCRA) with pH levels commonly in excess of 12.5.[24]

The long half life of many of the toxic materials found in cement kiln dust, and the variable discharge rates of these toxins into the leachate, means this hazardous waste will remain in the environment, and a risk to human health, for a very long time.

Connection to Cement Kiln Dust Dumped at Reserve Silica's Ravensdale Site

Industrial Mineral Products, Inc. (IMP) of Ravensdale mined silica sand from the Ravensdale site under lease from 1972 to 1986. At the same time, IMP also had the exclusive contract to develop and sell products derived from copper slag produced at the ASARCO Tacoma smelter.[25] One of the products IMP produced from the ASARCO slag was feedstock material for cement manufacturing which they sold to Ideal Cement (Holnam>Holcim) in Seattle.[26] In addition to the copper slag feedstock, IMP also sold silica sand mined from the Ravensdale site to Ideal for cement feedstock. In turn, Ideal Cement delivered their waste cement kiln dust to IMP for disposal on the Ravensdale site.[27] With the closing of the ASARCO Tacoma smelter in 1985, the sale of slag stopped, but the sale of silica sand and disposal of cement kiln dust at Ravensdale continued. In March 1986, the assets of IMP were purchased by L-Bar Products, Inc. (a wholly owned subsidiary of Reserve Industries Corp. and sister company to Reserve Silica Corp.). L-Bar Products continued the silica sand sales/cement kiln dust dumping relationship with Ideal/Holnam Cement . L-Bar Products oversaw dumping of cement kiln dust at the Ravensdale site from 1986 to 1989, during which time Ideal/Holnam was known to be burning ground tires as a supplemental fuel source for a period of time beginning in 1986.[28] Thus, it is likely that in addition to the extremely high pH and usual contaminants found in cement kiln dust, the material dumped at the

Ravensdale site may have had even further elevated levels of arsenic due to the high arsenic content of the ASARCO slag feedstock,[29] as well as possible dioxins and furans from the burning of tires by Ideal Cement as a supplemental fuel source.

Appendix 3-b What is Copper Slag?

Copper slag is the molten by-product from the heating and processing (smelting) of copper-bearing ore to extract the copper. The molten slag cools into a hard, black, rock-like substance, and contains many heavy metals concentrated from the raw ore from which the copper was smelted, with arsenic being an impurity frequently found in copper ore deposits.[1] The ASARCO Tacoma smelter processed copper ore with higher than average arsenic content.[2] Slag from the ASARCO smelter in Tacoma was laden with toxic metals including arsenic, lead, copper, cadmium, and other heavy metals.[3,4,5] Some slag from the Tacoma smelter was deposited in Commencement Bay where it cooled and hardened, creating a breakwater for an artificial harbor. Slag dumped and cooled on land was used as fill material, or ground and sold for a variety of purposes including cement manufacturing, building foundations, pavement, roofing granules, sandblasting grit, insulation, landscape rock, driveway gravel, and road ballast.[6,7] As a result of these uses, arsenic-laced ASARCO slag from the Tacoma smelter was disbursed throughout the region.[8]

ASARCO Tacoma Smelter. (WDOE – ASARCO: https://fortress.wa.gov/ecy)

Connection Between ASARCO slag and the Reserve Silica Ravensdale Site

Industrial Mineral Products, Inc. (IMP), Victor J. Hoffman, President, had the exclusive marketing contract for products derived from ASARCO slag through its subsidiary, Black Knight, Inc.[9,10] from 1973 until the ASARCO smelter closed in 1985.[11] During the same time period, IMP, from its corporate headquarters in Ravensdale, was mining silica sand from the Ravensdale site. A major ASARCO slag product produced and sold by IMP was ground slag for road ballast and driveway gravel. It is highly probable that IMP would have used these road ballast and gravel products for their own use on haul roads at the Ravensdale site during their mining and fill operations between 1972 and 1986. During a 1983 visit to the Ravensdale site, Greg Wingard reports picking up two samples of slag determined to be from the Tacoma ASARCO smelter;[12,13] however, WDOE was not able to locate this information in response to a 2013 Public Records request.[14]

In 1986, the assets of IMP, including the Ravensdale silica sand mining lease, were purchased by L-Bar Products, Inc. (wholly owned subsidiary of Reserve Industries Corp. and sister company to Reserve Silica Corp.), with Victor Hoffman remaining as president of L-Bar Products.[15,16]

4.0 Does Reserve's Current Proposal Meet The Requirements for a Mining Site Conversion Demonstration Project as Defined in King County Comp Plan I-203?

4.1 I-203 Requirements and Current Proposal

I-203 specifies five conditions a project must satisfy to qualify as a viable mining site conversion Demonstration Project. "*The demonstration project shall evaluate and address: (1) potential options for the use of a reclaimed mine site, including the feasibility of residential use and/or long-term forestry on the demonstration project site.*" The evaluation and feasibility assessment of a residential use of this site, as contained in the May 1, 2016 Demonstration Project proposal submitted by Reserve, is incomplete, inadequate and misleading. Of particular concern is the failure to even mention the substantial risk to human health such a proposed residential development on this site would pose. The Washington Department of Ecology has assessed the risk to human health[1] for potential exposure to the CKD-contaminated leachate and surface waters on this property at a 4.4 rating, on a 1 – 5 scale, where 5 is extreme risk to human health. And the DOE has expressed the opinion that exposure to these toxins is a very real possibility, even in spite of Reserve's proposal to limit the exposure risk with "signage and fencing".[2] Note that in Reserve's SEPA checklist for this proposal, they checked 'No' to the question of "*risk of exposure to toxic chemicals*" – clearly a misrepresentation of the facts.[3]

Also of very high concern is the risk posed by siting 72 homes, served by off-site public water and on-site septic systems, immediately above and in close proximity to the unlined CKD pits on the property; and how this would impact the ongoing (and as yet, unsuccessful) efforts to try to control, contain and cleanup the toxic contamination of surface and groundwater, that may already be threatening Ravensdale Lake and Ravensdale Creek, and eventually downstream public water sources at Kent Springs and the Covington Soos Creek Well Field. Further discussion of these environmental and human health risks can be found in *Section 3.7*. In Reserve's proposal, they indicate "*No significant adverse environmental impacts have been identified.*"[4] Once again, a misrepresentation, or at the very least, a minimizing of the likely impacts of the proposal.

Reserve's evaluation and feasibility assessment of the long-term forestry use of the site is also erroneous and misleading. Contrary to Reserve's assertion that reclamation of the site for long-term forestry use would require "impractical investment," our studies, based primarily on recommendations and data from Reserve's own contracted consultants,[5,6,7] would indicate the necessary forest reclamation costs are minimal, and conversion of the majority of the property to where it can support viable commercial forests over the long term is entirely practical. Further discussion of this conclusion can be found in *Section 2.2.*

The second criterion for evaluation specified by I-203 is "*the impacts to carbon sequestration as a result of reforestation, and for residential use …*" Reserve's contracted carbon sequestration analysis clearly favors a forestry use option over residential use, with their 'Do Nothing' option (unmanaged forest use) yielding double the net carbon sequestered over 90 years compared to Reserve's proposed

development option (107K tons sequestered under Do Nothing vs. 54K tons under residential development).[8] Reserve failed to analyze what should be the base case option, that of reclaiming the majority of the site for forestry, and rehabilitating and managing the forests for long-term commercial use. Under this option, the net carbon sequestered would undoubtedly favor the forestry use over the residential development use even more than their 'Do Nothing' option. This appears to be another instance of Reserve attempting to minimize data that does not support their proposal.

The third I-203 criterion requires a "*site design that compatibly integrates any proposed residential development on the … site with uses occurring on the adjacent rural or forest production district lands, …..*" As discussed in Section 2.6, this proposal is NOT compatible with either the adjacent FPD lands, nor with the adjacent and nearby rural lands, which are all designated Natural Area or Open Space lands.

The fourth I-203 criterion for evaluation is "*the levels and standards for reclamation of mining sites that are appropriate to their use either for long-term forestry and/or for residential development*."[9] Reserve's current proposal does a reasonable job of laying out recommended reclamation standards for both the forestry and residential use options. One key omission that should be addressed for both options, however, is what kind of toxic waste cleanup should be required as part of the reclamation process. The toxic contamination of soil, surface and ground water that they have been trying, unsuccessfully, to control for the past fourteen years is a direct result of the mining and dumping on the site. As such, reclamation is not complete until any and all mandatory, necessary, or WDOE-requested voluntary cleanup has been performed.

The final I-203 criterion is that "*the demonstration project provides an overall public benefit by providing permanent protection, as designated park or open space, of lands in the vicinity of the demonstration project site that form the headwaters of critical, high valued habitat areas; or that remove the development potential from nonconforming legal parcels in the forest production district; or that provide linkages with other forest production district lands.*" Clearly, this proposed project does nothing to remove development potential from nonconforming FPD parcels. And it actually destroys linkages with other FPD lands, leaving the two FPD parcels to the west isolated from the remaining FPD zone. So the key question with this I-203 criterion is whether the proposal provides 'an overall public benefit….'

Reserve claims that their proposal will "*… provide permanent protection to over 55 acres of wetland and wetland buffer*",[10] "*that serves as the headquarters* [sic, headwaters] *for Sonia Lake and Cinder* [*sic, Ginder*] *Lake open space.* ", claiming this as a key public benefit of the project.[11] Note that <u>nothing</u> in this proposal provides any additional 'protection' to this King County-designated Class 1 wetland complex that isn't already available under existing State and County regulations. This wetland is located in the portion of the property currently zoned Forestry and included within the FPD. And there has never been any documented mining disturbance to this wetland complex. Actually, contrary to Reserve's claim to a public benefit, siting 72 houses within as little as 150' of this wetland significantly <u>degrades</u> its 'protection' over the protections that currently exist, or that would be provided if the zoning on this portion of the property remained Forest and on the remainder of the property were to revert to Forestry. The proposed housing development "*is considered a high impact land use* activity"

by County wetland criteria.[12] And this decrease in protection is further exacerbated by Reserve's proposal to increase recreational opportunities for the residents, including the construction of trails and a possible equestrian center in the vicinity of this wetland.[13] As such, Reserve's proposal actually represents a significant negative net public benefit in terms of wetlands protection over current conditions, and certainly compared to the option of reclaiming the property for commercial forestry. It's also hard to argue that this wetland constitutes the '*headwaters of critical, high valued habitat areas*' as required in I-203. Virtually all of this tributary to Lake Sawyer runs through the Black Diamond city limits – hardly '*high valued habitat*'.

In Reserve's proposal package, they enumerate some of the other public benefits their proposal would provide.[14] However, they ignore the negative impacts to existing public benefits of the proposal. We have listed 21 different sources of potential 'public benefit', as derived from I-203 and from the FRCV Conservation Plan (adopted in the 2004 KC Comp Plan and embedded within the Greater Maple Valley/Cedar River CSA sub-area plan), and as listed in Reserve's proposal document. These potential sources of public benefit are shown in Table 4.1a. For each potential benefit source, we have identified the key public benefit impact on both the Black Diamond (TDR sending site) property, and on the Ravensdale (upzoned/receiving site) property. A green shading indicates a public benefit, a red shading indicates a negative impact to the public benefit, and a yellow shading indicates no impact or a neutral public benefit impact. And the final column of the table indicates the net, or 'overall' public benefit for each factor when considering both properties. While Reserve's proposal does provide several public benefits, primarily associated with their Black Diamond property, the net overall public benefit (last column) is clearly negative (mostly reds).

By way of reference, when the I-203 amendment was drafted and adopted in late December 2012, then Councilmember Larry Phillips, Reserve Silica, and Friends of Rock Creek Valley all envisioned the sending site being the 638-acre property formerly owned by Weyerhaeuser, located in Section 6 of Twp21N, Rng07E. See Figure 4.1. For brevity, this property was known as 'Section 6.' The analogous public benefits table for the envisioned 'Section 6 to Reserve Ravensdale Demonstration Project' is shown in Table 4.1b. Clearly, such an exchange would have easily met the 'overall public benefit' criteria of I-203, as well as all the other I-203 criteria as this was the property the amendment was designed to protect. To Reserve's credit, they went above-and-beyond in their efforts to try to purchase the development credits from the current owner of Section 6 (Carolem Corp. out of Hollywood, CA), but they were unsuccessful. It was only after these attempts failed that Reserve Silica, wishing to still reap the benefits of selling residential lots on their Ravensdale property, chose to purchase the Black Diamond property as a substitute sending site, and in the process growing the project from what would have been a 22-unit development under the intended Section 6 alternative to what is now a proposed 72-unit development.

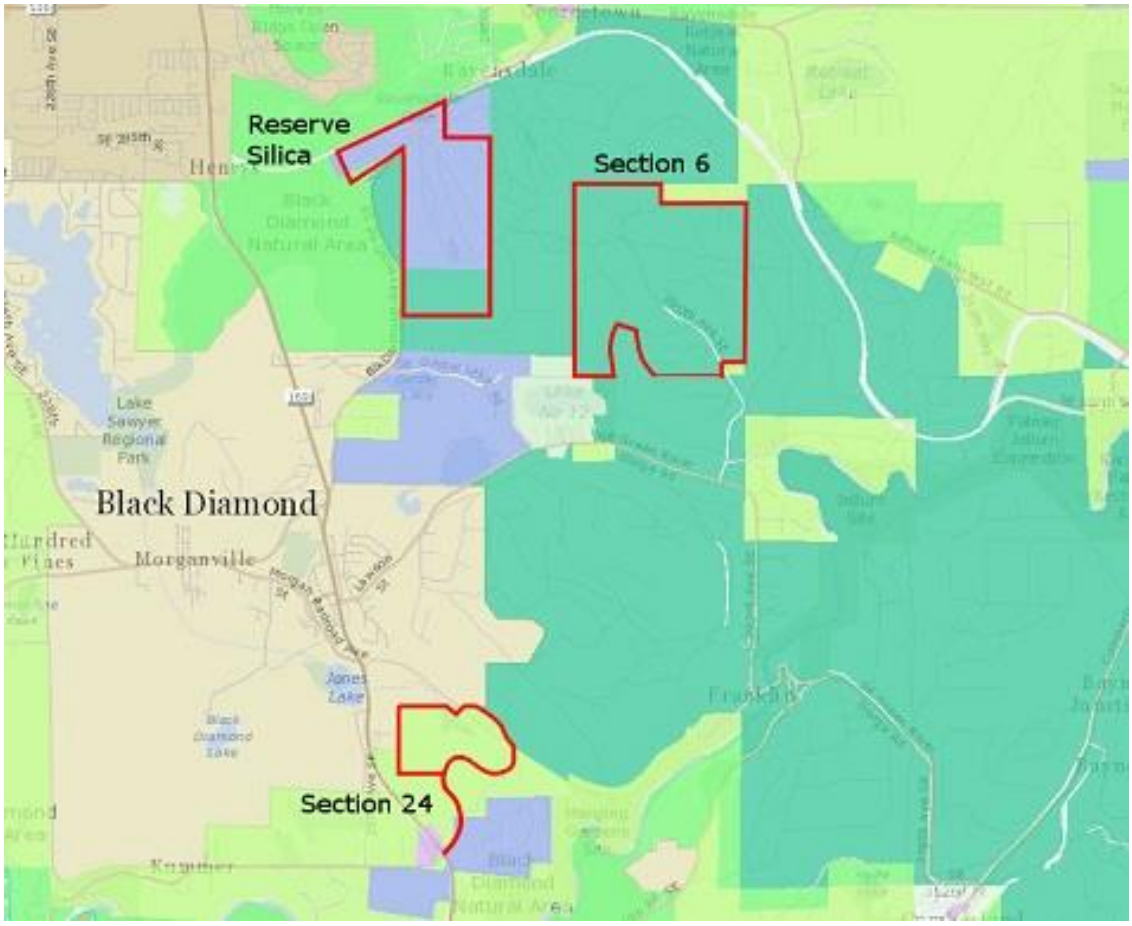
Given the above, we strongly disagree with Reserve's Development Agreement, under which the County would "*acknowledge and agree that the Reserve Rural Conversion Project* [i.e., the proposed I-203 Demonstration Project], *constitutes a public benefit by, inter alia, providing Commercial Forest, housing, carbon sequestration, reclamation of mined lands, preservation of wetlands that serves as the*

headquarters [sic, headwaters] *for Sonia Lake, and Cinder* [sic, Ginder] *Lake open space, and increased and enhanced equestrian recreational opportunities.*"[15] The commercial forest, carbon sequestration, wetland preservation and mining reclamation under this Demonstration Project proposal are all substantially less than the comparable benefits available from a forestry reclamation and Forest zoning option; and the increased and enhanced recreational opportunities accrue ONLY to the site's residents, not the public in general.[16] Furthermore, the reclamation of depleted mining lands is required regardless of which option is chosen. So the only net benefit from this list Reserve is asking the County to acknowledge is the increase in housing – which is antithetical to King County goals for Rural and Natural Resource lands.

In summary, ***Reserve's current proposal for a mining site conversion Demonstration Project does NOT meet ANY of the five criteria specified in I-203.***

Figure 4.1. Reserve Silica and TDR Site Location

Reserve Silica Ravensdale site in relation to location, acreage and zoning of intended Section 6 TDR site vs. currently proposed Section 24 TDR site.



Source: King County iMap.

Table 4.1a Demonstration of Net Public Benefit of Current Reserve Silica Proposal.

Public Benefit	Benefit to BD property	Benefit to Ravensdale property	Net Benefit
1. Protect Headwaters of Critical, High Value Habitat Area	Not headwaters	Wetland more at risk	Slight Negative
2. Remove Development Potential in Non-conforming FPD parcels	Not FPD	Adds development	Negative
3. Provide linkages with other FPD lands	No	Isolates parcels to W	Negative
4. Block Up FPD	Not FPD	Fragments FPD	Negative
5. Protect timber from development clearing	111 ac 2-yr old protected	52 acres mature cleared	Negative
6. Reduce potential conflicts with adjacent Resource lands	Minimal adj Res lands	Known + likely conflicts	Negative
7. Reduce housing density on Natural Resource lands	Not resource lands	Add'l 68 houses[1]	Negative
8. Reduce housing density on Rural lands	Net 25 house reduction	Net 40 house increase[2]	Moderate Negative
9. Block up lands protected from development	No	72-house island	Major Negative
10. Maximize acres under timber/open space Cons Easement	111 acres	275 acres[3]	Positive
11. Protect high-functioning wetlands	Temp wetland[4]	Wetland more at risk[5]	Negative
12. Block Up Wildlife Habitat	No	Houses break habitat	Slight Negative
13. Provide Wildlife Connectivity	Some	Yes (impaired by housing location)	Positive
14. Increase net carbon sequestered over 'Do Nothing' option	Some gain	Substantial Loss	Major Negative[6]
15. Maximize Acres protected/TDR from sending site	5 acres/TDR[7]	Not sending site	Negative
16. Enhance Urban-Rural Buffer	Some buffer for BD	res island >1 mi from UGB	Major Negative
17. Provide green space for urban area	Yes	Not adj to urban area	Major Positive
18. Minimize environmental impacts of development	25 house reduction	40-68 house incr; CKD[8]	Major Negative
19. Minimize exposure of residents to health hazards	No known hazards	Major exposure risk	Major Negative
20. Reduce traffic	-25 houses adj to BD	68 house increase	Negative
21. Reduce need for public services to serve development	-25 houses adj to BD	68 remote houses 1.5mi to public H_2O	Negative

It is VERY hard to make the case that the proposed Demonstration Project will yield an overall public benefit, as required by I-203.

[1] 72 proposed vs 4 currently allowed

[2] 72 proposed vs RA-10 on 327 acres=32 (377 acres-CKD-mitigation-coal tailings)

[3] 377 acres – 52 Dev – 20 CKD – 20 mitigation – 10 coal tailings

[4] County determined wetland is from beaver dam, determined to be temporary

[5] 72 houses will raise risk to wetland

[6] > 50% reduction in net carbon sequestered over 90 years

[7] Most sending sites would be F (80 acres/TDR), or Rural Forest Focus Area (RA-20) or RA-10

[8] 68 house increase over F zone; 40 house increase if zoned RA-10; houses represent major risk to efforts to control ongoing CKD contamination

Table 4.1b Net Public Benefits of I-203 Demonstration Project if Implemented as Envisioned[1] to Protect Section 6.

Public Benefit	Section 6	Ravensdale property	Net Benefit
1. Protect Headwaters of Critical, High Value Habitat Area	Very High, Rock Creek (Cedar)	Wetland slightly more at risk	Strong Positive
2. Remove Development Potential in Non-conforming FPD parcels	Yes, 18 parcels	Parcels conform	Positive
3. Provide linkages with other FPD lands	Already FPD	Yes, revert to F zoning	Positive
4. Block Up FPD	Already FPD	Yes, revert to F zoning	Positive
5. Protect timber from development clearing	638 ac 37-yr old protected	Slight reduction from 18 houses	Positive
6. Reduce potential conflicts with adjacent Resource lands	Yes, 18 houses reduced	No, 18 more houses	Neutral
7. Reduce housing density on Natural Resource lands	Yes, 18 houses reduced	No, 18 more houses	Neutral
8. Reduce housing density on Rural lands	Not Rural	Not Rural	Neutral
9. Block up lands protected from development	Yes, 638 acres	No, 18 add'l houses	Slight Positive
10. Maximize acres under timber/open space Cons Easement	638 acres	No Cons Easement	Positive
11. Protect high-functioning wetlands	Yes, Crow Marsh	Minor Wetland slightly more at risk	Slight Positive
12. Block Up Wildlife Habitat	Yes, Ravensdale Ridge	Slight decrease	Slight Positive
13. Provide Wildlife Connectivity	Yes, Cedar-to-Green	Slight decrease	Slight Positive
14. Increase net carbon sequestered over 'Do Nothing' option	Yes, 18 houses reduced	No, 18 add'l houses	Neutral
15. Maximize Acres protected/TDR from sending site	35 acres/TDR	Not sending site	Slight Positive
16. Enhance Urban-Rural Buffer	Not in buffer	No, 18 add'l houses	Negative
17. Provide green space for urban area	No	No	Neutral
18. Minimize environmental impacts of development	18 house reduction	18 house incr; CKD	Negative
19. Minimize exposure of residents to health hazards	No known hazards	18 house incr; CKD	Negative
20. Reduce traffic	-18 houses	+ 18 houses	Neutral
21. Reduce need for public services to serve development	-18 remote	+18 houses, less remote	Neutral

The Demonstration Project as envisioned when I-203 was written in December 2012 would have provided a substantial overall net public benefit.[2]

[1] 2012 Demonstration Project was designed and intended to transfer 18 development credits from Section 6 to Reserve's property; revert Reserve property to Forest-zoning, with 4 credits; install 22-unit clustered development; and permanently protect Section 6 in FPD at heart of Ravensdale Ridge from all future development.

[2] At the time I-203 was written and endorsed, the extent of the hazardous toxic waste issues on the Reserve Silica site were not known to Councilmember Phillips or FRCV. Knowledge of this information would have precluded support by FRCV for any residential development plans whatsoever on the property.

4.2 Is Reserve's Current Proposal Consistent with King County Policy and Goals?

To upzone Reserve's property to Rural Residential and approve a 72-unit rural community on the property would violate at least 20 existing, long-standing King County policies, as well the Greater Maple Valley/Cedar River CSA sub-area plan.

Policy R-691

Of primary significance to this proposal is policy R-691, which deals with mining site reclamation. This policy states that "*Reclamation of mining sites in the Forest Production District should return the land to forestry.*" Reserve's property south of the Black Diamond-Ravensdale Road IS within the FPD. These lands were zoned Forestry in 1985, and placed within the original FPD,[1] as part of the BN/Plum Creek timberlands operating block. (See Figure 4.2a.)[2] The FPD boundary followed the Black Diamond-Ravensdale Road, and also included the current Powell and Baja Properties parcels, thus blocking up the FPD as required by GMA. This situation is confirmed by Reserve,[3] stating "*The '85* [Comp] *Plan did include the RS* [Reserve Silica]*, Sanders* [now Baja Properties] *and Read* [now Powell] *properties in the FPD.*" The Mining zoning was a temporary overlay added later (ca. 1996) and, according to the Rural Forest Commission,[4,5] this zoning was approved by Reserve's predecessor - Plum Creek Timberlands. As such, R-691 would indicate the property should be reclaimed for forestry, revert to its original Forestry land use and zoning, and be included within the FPD.

Reserve argues that King County does not currently show most of the property (other than the southernmost 80 acres) as being within the FPD, and thus the mining portion should fall under the R-691 provision which states "*When reclamation of mining sites located outside of the Forest Production District in completed, the site should be considered for redesignation to a land use designation and zoning classification compatible with the surrounding properties.*" But as noted in Section 2.4, a Rural Residential land use and zoning would be incompatible with the surrounding FPD lands, which occupy 77% of Reserve's perimeter; and would also be incompatible with the remaining 23% of surrounding lands that are designated Natural Area and Open Space lands. (See Figure 4.2b.) As such, even under this provision, the Reserve property should revert to a Forestry Land Use and Zoning.

The southernmost 80 acres of Reserve's property is clearly currently zoned Forest, and is included within the FPD. Reserve's proposal would ALSO upzone these Forest-zoned lands to Rural Residential. But R-621 and R-623 address this issue, stating "*Lands may be removed from the FPD only through a subarea study, and only to recognize areas with historical retail commercial uses.*" The applicable subarea study, the Greater Maple Valley/Cedar River CSA sub-area plan, does not provide for such an upzone, and this area certainly has no "historical retail commercial uses."

Policies R-208. R-302, and R-334b

Even if the property were to be upzoned to Rural Residential, this is still within a Rural Forest Focus area. Policies R-208, R-302, R-330 and R-334b address this issue, stating "*The Rural Forest Focus Areas should be maintained in parcels of 20 acres or more in order to retain large, contiguous blocks of rural forest.*"

Reserve's clustered proposal has an average lot size of less than ¾ acre each. Even crediting the 72 clustered lots with the full 377 acres of the property yields an average lot size of just over 5 acres – far short of the 20-acre Rural Forest Focus Area target.

Policies E-462, E-495, E-496, and E-497b

These policies all address protecting groundwater supplies. Siting 72 houses on septic, with public water provided from off-site, in close proximity and directly above capped CKD disposal areas already infiltrated with bedrock and shallow aquifer groundwater,[6] is a major groundwater contamination threat from an as yet uncontrolled[7] toxic source.

Policies R-334d, R-201i, and R-629

These three policies address providing public utilities and services. For example, R-334d states "*Clustering of lots* [in the Rural Area] *is permitted when ….. the development can be served by rural facility and service levels (such as ….private well(s) for on-site water supply…)….*" This development is to be served by Covington Water,[8,9] due to the contaminated groundwater supplies on portions of this site. This service will require extending Covington water mains an additional 1.5 miles further into the Rural Area/FPD,[10] and will require an expansion of the designated Covington water service area.[11]

Policy R-684

Policy R-684 states "*The preferred adjacent land uses to sites designated as Mining on the Land Use Map are mining, industrial, open space or forestry uses.*" The Wagner/Erickson parcel adjacent to Reserve's NE corner is zoned Mining, and is a viable coal resource. So assigning a Rural Residential Land Use to Reserve's property located adjacent to the Wagner/Erickson mining zoned property, and constructing 32 homes on the northern Development Area in close proximity to this mining-zoned site, is a clear violation of Policy R-684.

Policies R-312, R-313, R-314d & e, R-319, and R-322

These six policies all address the use of TDR's, with the key goal stated as "*encourage higher densities in urban areas and reduce residential development capacity in Rural Area and Natural Resource Lands.*" In brief, the proposal distributed by Reserve on April 6, 2016 (at the Ravensdale KC Council meeting) and in their expanded May 1, 2016 proposal, is to upzone the Ravensdale site to RA-10; transfer 25 of the available 28 development credits from their Black Diamond Section 24 property to the Ravensdale site (a rural-to-rural transfer); purchase 9 TDRs from the King County TDR bank; build a 72-unit housing development at Ravensdale; place 126 acres of Section 24 under conservation easement, and sell the remaining three 5-acre parcels on Section 24 for residential development.[12]

Under this scenario, the total houses on Reserve's two properties (the Ravensdale site [Rav] and the proposed Black Diamond Section 24 TDR sending site [BlkD]) would increase by 43 units (72 on Rav plus 3 on BD = 75 units vs. current zoning of 28 on BlkD plus 4 on Rav zoned Forest = 32 units). This proposal would also increase the total houses on what is now Natural Resource Lands by 68 units with the siting of 72 homes on the Ravensdale site vs. four if the site reverted to Forestry zoning. Further, if the Ravensdale upzone is approved, the proposal would increase the total number of houses in the Rural

Area by 14 units (72 on Rav plus 3 on BlkD vs. 33 on RA-10 upzoned Rav +28 on BD). This proposal also requires a Rural-to-Rural TDR, which is highly contested and in violation of R-319. There is nothing in the I-203 mining site conversion Demonstration Project amendment which explicitly endorses a Rural-to-Rural TDR transfer; and serious thought should be given as to the wisdom of setting a Rural-to-Rural transfer precedent.

Recognizing the likelihood of widespread opposition to a rural-to-rural transfer of development credits, Reserve's consultant noted that Reserve is also considering a variation to their published proposal above. In brief, this alternative proposal would be to donate 25 of the available 28 development credits from the Black Diamond Section 24 property to the King County TDR bank; up-zone the Ravensdale site to RA-5; build a 72-unit housing development at Ravensdale; (presumably) sell or donate the three extra development credits from the Ravensdale site to the King County TDR bank; place 126 acres of Section 24 under conservation easement, and sell the remaining three 5-acre parcels on Section 24 for residential development.[13]

Under this thinly disguised attempt to technically avoid a rural-to-rural transfer, the total houses on Reserve's two properties would still increase by 43 units. Plus, in donating 25 TDRs from their Black Diamond property, and donating or selling another three from the Ravensdale property (a RA-5 upzone would give them 75 units on the Ravensdale property), the total houses in the Urban area would also increase by 28 units. That is a net increase of 71 housing units – 43 in the rural area and 28 in the urban area!

Clearly, neither of the above scenarios do anything to further the goal of reducing residential development capacity in the Rural Area and Natural Resource Lands. Rather, both proposals would more than double the number of houses in the Rural Area/Natural Resource Lands over the density permitted under the current RA-5 zoning on the Black Diamond Section 24 property and a return of the Ravensdale property to a Forest zoning ([72+3]/[28+4]).

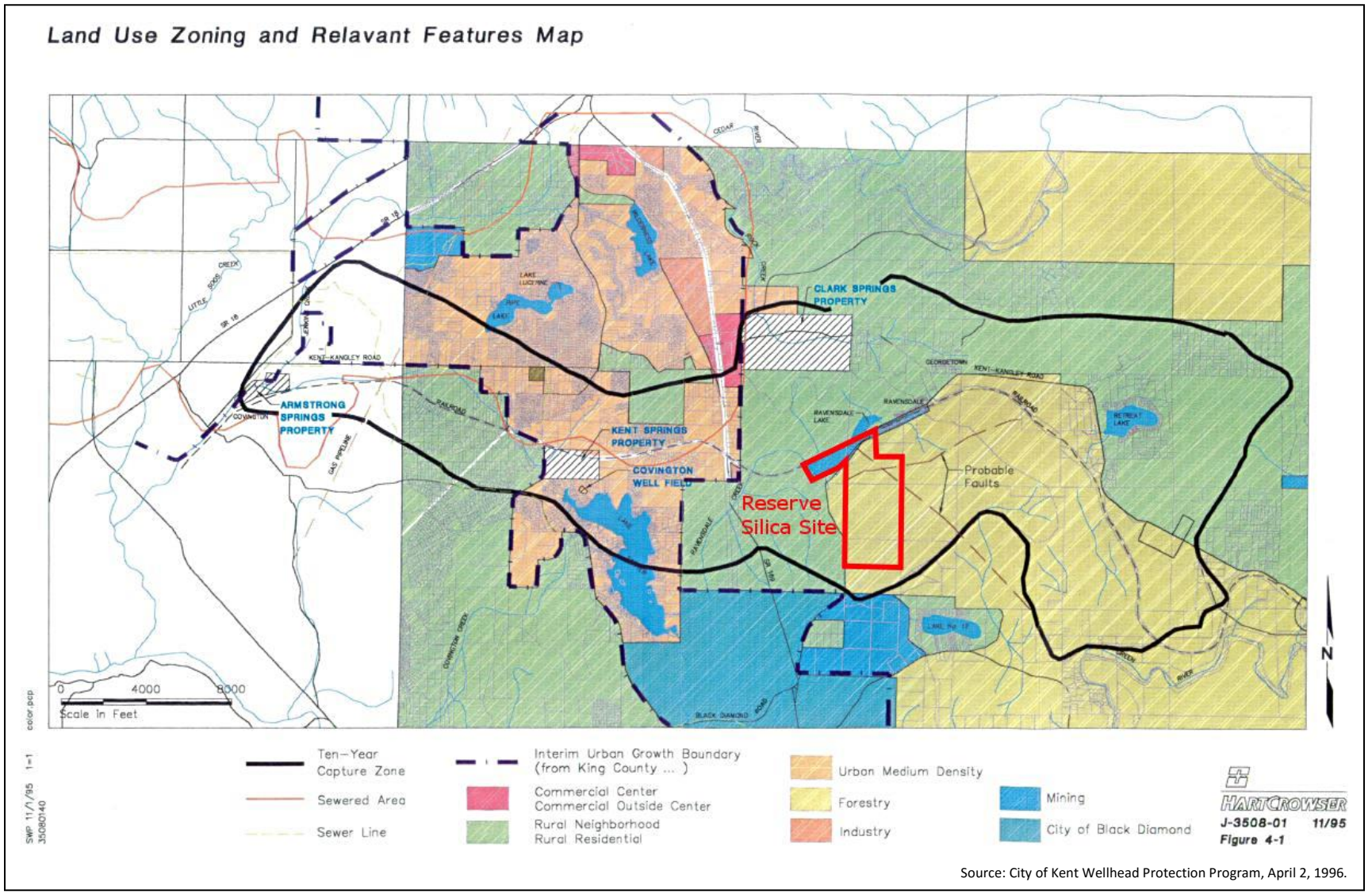
Policy CP-1105

Finally, CP-1105 reinforces the "*conservation of natural resource lands and environmentally sensitive area through community efforts such as the Rock Creek Valley Conservation Plan and the Friends of Rock Creek.*" The RCV Conservation Plan was adopted by the County in 2004. This upzone proposal does NOT comply with the RCV Conservation Plan, nor with the Mission/Goals of the FRCV.[14]

In conclusion, ***Reserve's current proposal is a direct violation of many, long-term existing County policies.***

Figure 4.2a Forestry Zoning 1995

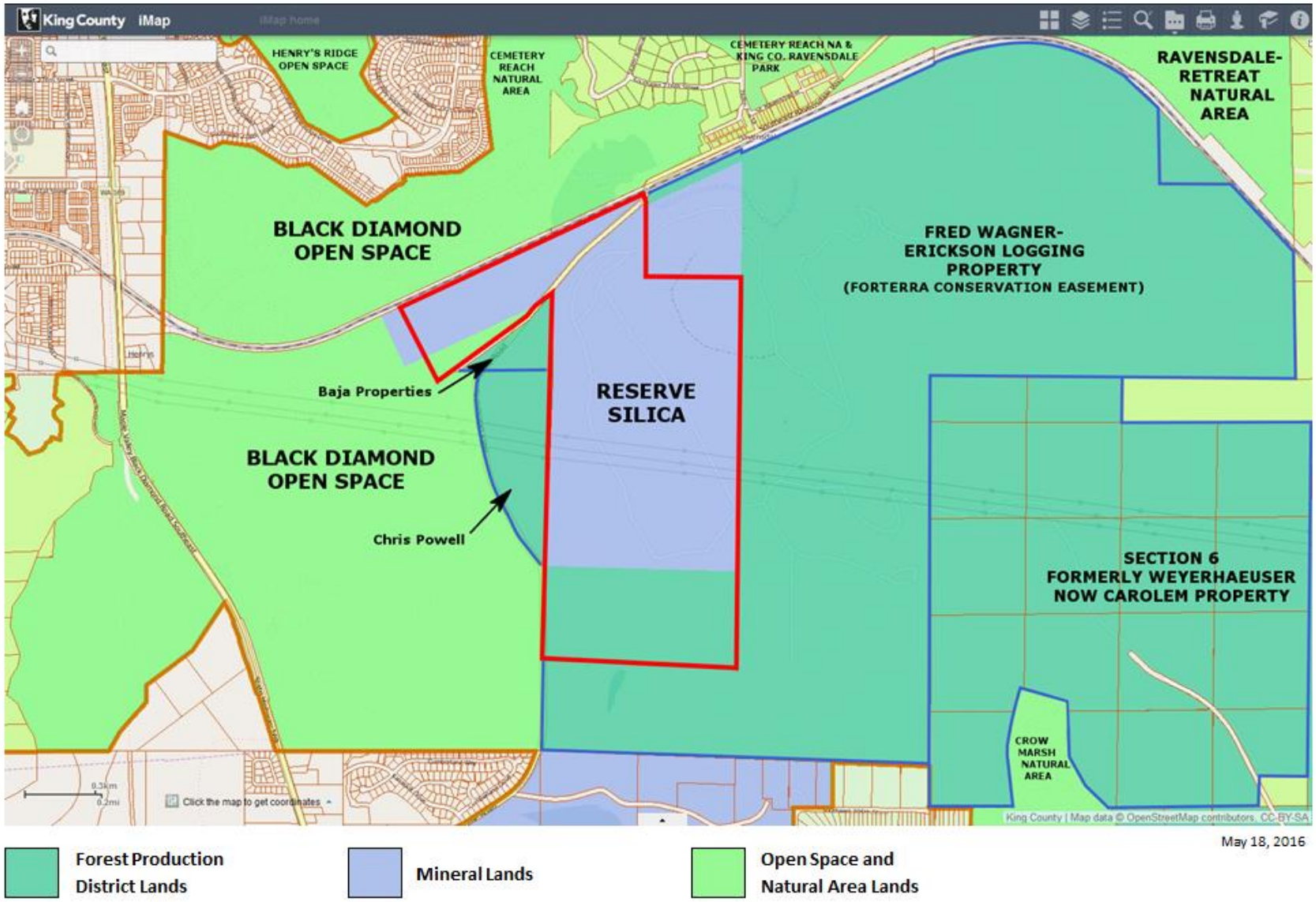
This November 1995 zoning map, included in the City of Kent Wellhead Protection study, indicates the entire Reserve Silica property, aside from the processing plant and clay settling ponds, was zoned Forestry and was part of the original FPD.



Source: City of Kent Wellhead Protection Program, April 2, 1996.

Figure 4.2b Surrounding Land Uses

Reserve Silica property is entirely surrounded by Forest Production District Lands and King County Open Space lands.



4.3 Would Upzoning Reserve's Property to Rural Residential Set a Precedent for Other Disadvantaged Natural Resource Lands?

Reserve claims upzoning this property would not set a precedent to upzone other resource-zoned lands,[1] pointing out that the FPD lands owned by Wagner/Erickson to the northeast, east and south of Reserve are protected by a Conservation Easement owned by Forterra which does not allow any permanent structures to be built on the property. As such, this adjacent ownership would not be in a position to upzone their property from Forestry.

We agree with this conclusion as it relates to the Wagner/Erickson forestlands. However, we are aware of three mining sites within the 32 square mile Rock Creek Valley that would be highly likely to follow through with an upzone request should a precedent be set with Reserve.[2] The Middle Green River Coalition also has identified three mining sites in their area that they expect would file for an upzone under this precedent.[3] And the Rural Forest Commission identified another mining site near North Bend that they expect would file for an upzone if the precedent were set.[4] In addition, there are over 8,500 acres of former Plum Creek lands within the FPD just east of Black Diamond that Plum Creek segmented into 20 acre parcels in the 1990s prior to selling these lands. As such, these lands no longer satisfy the 80-acre minimum lot size for Forestry zoned lands.[5] Weyerhaeuser followed a similar course on some of their King County lands prior to selling.[6] Many of these have now been purchased by owners with an objective to hold the lands for development.[7] With a precedent set for upzoning Mining lands to Rural Residential (rather than reverting to the underlying Forest zoning), once the minerals are depleted or the mining is no longer profitable, it is highly likely that some of these former industrial forestland owners would apply the same logic to apply for an upzone, claiming their lands no longer qualify as FPD lands.

In summary, ***it is highly likely that other mining and forestry Natural Resource zoned property owners would apply for upzoning to Rural Residential if the precedent were set by Reserve***. We strongly believe that King County should absolutely NOT set a precedent for upzoning Natural Resource lands to Rural Residential, as it could easily open a floodgate of other upzone applications that would seriously threaten the viability of many of the County's remaining Natural Resource lands.

4.4 Conclusions: Compatibility with I-203 and King County Policy and Goals

Reserve's current proposal does <u>not</u> meet any of the five criteria specified in I-203 to qualify as a mining site conversion Demonstration Project. Their assessment of the residential use option for the property is seriously lacking, ignoring both the substantial risk to human health for the future residents from both known and unknown toxins on the site, and the substantial environmental risk the proposed development would pose to on-going efforts to try to control toxic contamination of soil, surface and ground water from Cement Kiln Dust. To approve Reserve's Demonstration Project proposal would violate at least 20 existing, long-standing King County policies, as well the Greater Maple Valley/Cedar River CSA sub-area plan. Such approval would also set a dangerous precedent which could ultimately prove devastating to the County's efforts to preserve its precious Natural Resource lands.

5.0 What Other Major Issues are Associated with Reserve Silica's Current Proposal?

Besides the numerous critical flaws with Reserve's proposal as enumerated above, there are other additional issues with the proposal that any reviewer should carefully consider. Among these are:

5.1 What Liabilities and Obligations Would King County Be Accepting Under This Proposal?

Under Reserve's current proposal, Reserve would continue to hold title to the property[1] and the County would have ownership of a Conservation Easement covering all but the 54 acres actually occupied by the proposed 72 lots. This 323 acres is known as the "Easement Area," and is comprised of "*forest, open space, wetlands, grasslands, and reclamation areas*" – collectively known as the "Conservation Values."[2] By accepting this Conservation Easement, King County is agreeing "*to preserve and protect in perpetuity the Conservation Values*."[3] Note that the Conservation Values include the capped CKD pits, the uncapped remediation area (with the still uncontrolled CKD-contaminated surface and ground water), the recently filled mine pits undergoing reclamation, the old coal tailings pile, the plant site and clay settling ponds, the buffer strips between housing clusters, etc. It should be noted that Reserve offered to donate a Conservation Easement to 300 acres of this land to Forterra Land Trust in 2012, and Forterra declined.[4]

It is unclear in Reserve's proposal just what role King County would play in 'preserving and protecting' the Conservation Values. The Homeowner Association is charged with responsibility for managing both the 'managed forest' and the Holcim Agreement and Easement (on the capped CKD pits and the mitigation area).[5,6] It is also not spelled out who would have responsibility for funding these management activities. And while the HOA is charged with managing the Holcim agreements, Reserve retains the right to do "*reclamation and closure activities related to past mining activities.*"[7] And while the HOA is charged with managing the forest lands, Reserve "*reserves the mineral, water, carbon and resource* [timber] *rights to the property*."[8] So the HOA manages (and funds?) the forest reclamation, but Reserve retains the harvest rights[9] and the rights to any carbon sequestration credits attributable to the forest.

The proposed "Open Space" lands in these Conservation Values should also be carefully considered. The 57 acres Reserve has defined as Open Space lands are comprised of (a) 20 acres of capped, fenced, CKD pits under permanent easement to Holcim,[10,11] with absolutely NO use allowed other than Hazardous Waste containment, and extremely restrictive management requirements that require the site to be perpetually in mowed grass to avoid potential shrub/tree penetration of the clay cap protecting the underlying CKD hazardous waste;[12,13] (b) 20 acres of BPA powerline easement, segmented into three pieces by capped and fenced CKD pits;[14,15] and (c) 17 acres of buffer strips between the 9 clusters of houses (average width <150').[16] Obviously, this isn't your typical "open space" lands. Reserve blatantly claims these 57 acres will provide recreational opportunities for the residents ("*Managed Open Space*

area of 57 Acres to provide recreational opportunities for the residents on the property with the potential of an equestrian facility.")[17]

The County Exec's staff comments in 2012 to this proposal are telling. "*It would be inappropriate to accept such restricted and compromised areas as open space.*" "*Neither a future homeowner association nor the County Parks Division should be saddled with unmanaged open space that needs a high level of restoration.*" "*It would be an expensive mistake for the County to accept these disturbed areas as open space.*"[18]

Obviously, the 57-acres of Open Space Reserve is proposing does NOT qualify as open space by County standards, and has NO place within the County DNRP portfolio. The same goes for the ~20-acre Holcim remediation area, where the majority of the highly contaminated and toxic leachate, surface and groundwater is still uncontrolled, and has migrated off-site, in spite of over fourteen years of efforts at trying to control this source of contamination.

The above observations relate to the 323-acre "Easement Area." The remaining 54 acres of developed lots is presumably covered by the Covenants, Conditions and Restrictions (CCR's) proposed by Reserve in Appendix C of their May 1, 2016 proposal. However, the area covered by CCR's is not specifically defined in the May 1, 2016 proposal (Exhibit A defining "The Property" has been left blank).[19] Reserve retains the right to modify any of the CCR's at their discretion at any time during the development period (up to the next 20 years).[20] Reserve also retains the right to define 'Common Areas' within the area covered by CCR's. 'Common Areas' can include "*roads, trails or other access ways, parks, sensitive area tracts or open spaces designated by Declarant* [Reserve] ….. *streams, storm water control facilities, …. drainage easements or facilities, … easements or other areas of facilities designated by Declarant herein or in other recorded documents …..*"[21] 'Common Areas' designated by Reserve will be deeded to King County,[22] and lot owners will have a non-exclusive easement to these 'Common Areas'.[23] The HOA will be charged with managing and maintaining the 'Common Areas',[24] apparently at their expense.[25]

These CCR provisions give Reserve pretty much complete control on defining what lands will be deeded to King County as 'Common Areas', as well as modifying the CCR's as they see fit. Provided the area covered by CCR's (i.e., [the blank] Exhibit A of Appendix C) clearly specifies that "The Property" only covers the 54 acres of developed lots, this may not be a major issue for the County. If however, Exhibit A were to include any of the remaining 323 acres, such as the capped CKD pits (declared 'open space' by Reserve) or the uncapped mitigation area (declared 'forest' by Reserve), then the proposed CCR provisions could pose major risks and liabilities to the County.

The Development Agreement; Conservation Easement; and Covenants, Conditions and Restrictions proposed by Reserve can collectively shift substantial responsibility and liability for this property from Reserve to the future Homeowner Association and to King County, while largely retaining Reserve's ability to extract additional value from the property through future timber harvest and lot sales. The County should VERY carefully review and revise these documents if ever considering approval of this proposal.

5.2 Is It Practical for the HOA to Manage the Forest Reclamation and Holcim Agreements?

Reserve's proposal calls for the Homeowner Association to manage the restoration and operation of the proposed 211-acre 'managed forest' and also to manage the Holcim CKD waste agreement and easements.[1,2,3] It is totally impractical to expect a HOA to be able to effectively perform either of these highly technical and complex functions, nor to fund these management functions. Reserve should NOT be allowed to skip out from their responsibility for either of these reclamation and cleanup obligations.

5.3 Does the Proposal Really Enhance Public Recreational Opportunities?

While Reserve touts the increased recreational opportunities of their proposal ("*The County recognizes the public benefits that will accrue from this Development Agreement, including ….. increased and enhanced equestrian recreational opportunities.*"[1] and "*The project will enhance such* [existing recreational] *opportunities.*[2]), it should be noted that no access rights to the general public will be provided to any portion of the property.[3] As such, any recreational benefits will accrue solely to the residents of the Reserve development. Hardly a "public" benefit. It's also worth noting that all references to the equestrian facilities are couched as 'possible' or 'potential' - Reserve retains sole authority to decide whether such facilities are built or not.

5.4 Does the Community Support This Proposal?

There has already been extensive opposition expressed to Reserve Silica's Demonstration Project proposal and to Demonstration Projects in general. Letters of opposition have already been submitted by the County Exec and his staff (Exec's proposed draft of 2016 Comp Plan), the Rural Forest Commission,[1] the Greater Maple Valley Unincorporated Area Council,[2] Friends of Rock Creek Valley,[3] the Middle Green River Coalition,[4] and the City of Black Diamond.[5] Expressions of concern regarding installation of a 72-unit development on the property have been voiced by Washington Department of Ecology-Water Quality program,[6] and numerous Ravensdale-area residents.

5.5 Should Policy I-203 be Extended in the 2016 KCCP to Allow Reserve to Submit Their Current Proposal?

Reserve Silica has had nearly four years since adoption of the I-203 demonstration project amendment to submit a proposal, and have not done so. When Reserve's efforts to purchase the development rights from the TDR sending site (Sec 6, T21N,R07E) originally envisioned with the passage of the I-203 Amendment failed, they chose, in June 2014, to purchase the 147-acre Black Diamond tract as an alternative sending site – over two years ago. On June 30, 2015, they stated their intention to submit a proposal to the King County Council and Exec "in the next week or two,"[1] but failed to do so. They did finally submit a 12-page summary of their current proposal to the KC Council Committee of the Whole meeting on April 6, 2016. And they completed their full 273-page proposal document (dated May 1, 2016) and indicated on May 27 that delivery of this full document to the County was imminent.[2] Still,

three months later, there has been no submission. As such, we believe Reserve has already had ample opportunity to submit a Demonstration Project proposal, but has failed to do so. There is still a four-month window for Reserve to submit a proposal before the 2016 KCCP is adopted.

Even if the mining site conversion provision of I-203 were extended, the major issues with the May 1, 2016 proposal (the known and unknown contaminates on the site; the yet to be determined clean-up requirements; the health risks to future residents and the potential liability to King County in approving this development; the failure of the proposal to meet the qualifications of the I-203 policy; and the numerous County Codes such a project would violate – to mention just a few) would make it highly unlikely that any Demonstration Project would be approved for this site for years to come, if at all. Thus, any extension of the I-203 policy would only serve to create a state of limbo during which it is likely little more will be done to complete reclamation and substantial restoration of the property to its pre-mining state.

6.0 WHO IS RESERVE SILICA / RESERVE INDUSTRIES?

Reserve Silica Corporation is part of a complex network of past and present corporations managed by the Melfi Brothers, Frank, William and James, through the parent company, Reserve Industries Corporation, headquartered in Albuquerque, New Mexico. The Melfi Brothers have been directly responsible for the management of the companies of Reserve Industries since 1985 when they assumed leadership of the company from their father, James Melfi, Sr. Likewise, the history of operators and activities on the Ravensdale site is long and varied. The following biographical sketches of the major companies managing the Ravensdale site are provided in an attempt to make sense of the history of the Ravensdale site and the major players in that history.

6.1 Who is Reserve Industries Corporation?

Reserve Industries Corporation was formed in 1957 under the name, Reserve Oil & Minerals Corporation.[1] In 1962, James J. Melfi Sr. took control of the company.[2] James Melfi Sr. retired as Chairman of the Board in 1985, at which time his three sons, James, Frank, and William, assumed leadership of the company. Current principals of Reserve Industries are listed as:

- Frank C. Melfi, Director, President, Chief Executive Officer;
- William J. Melfi, Director, Vice President for Finance and Administration; and
- James J. Melfi Jr, Director, Chairman of the Board.[3,4]

Location of Reserve Industries headquarters, Albuquerque, New Mexico.

Reserve Oil & Minerals changed its name to Reserve Industries Corporation in 1987.[5,6,7] Prior to August 1992, Reserve Industries was listed on the NASDAQ National Over-the-Counter Market, but following 10 years (1992-2002) during which the corporate financial statements were not independently audited, the company ceased filing of financial information with the Securities & Exchange Commission, and is no longer a publically traded corporation.[8]

From its beginnings in uranium exploration, mining and processing in New Mexico, Reserve Industries grew into a multi-national corporation with global interests in mineral exploration, extraction and processing, and industrial waste processing. Through numerous subsidiary companies, joint ventures and equity interests, Reserve Industries has, at various times in its history, been connected to operations in multiple locations in the U.S. and Canada, as well as in the Philippines, Singapore, Japan, Slovakia, Belgium, and China[9] – and possibly other locations as well for which records have not yet come to light. Reserve Industries connections to Washington State go back to as early as 1977 when they were exploring for uranium in Pend Oreille County.[10] Since the purchase of the assets of Industrial Mineral Products in March 1986, Reserve has had a major presence in Washington State through its wholly owned subsidiaries, L-Bar Products, Inc., Reserve Silica Corporation, and now Reserve Properties, LLC.

The following is a partial list of subsidiary companies, joint ventures and equity interests (past and present) of Reserve Industries:[11,12,13,14,15]

Wholly owned subsidiaries and/or affiliated corporations:

- Reserve Silica Corporation (silica sand mining)
- Reserve Properties, LLC (holder of Black Diamond Sec. 24 property)
- Reserve Minerals Corporation
- Reserve Abrasives Ltd., Inc.
- Reserve Rossborough Corporation (products for steel manuf.)
- Reserve Rossborough Ventures Corp (products for steel manuf.)
- Reserve Trigon Corporation
- Rossborough-Remacor LLC
- Reserve Trisal, Inc.
- Industrial Mineral Products (Philippines), Inc.
- Melfi Corporation
- L-Bar Products, Inc.
- L-Bar Minerals Corporation
- L-Bar Canada, Inc.
- L-Bar Ag Products, Inc.
- L-Bar – Rossborough
- L-Bar Grinding Corporation
- McCoy Mining Corporation
- Embro Corporation

Joint ventures and/or shared operations:

L-Bar Minerals [Reserve Oil & Minerals] and Standard Oil of Ohio [SOHIO] (L-Bar Ranch, New Mexico: uranium mining and processing)
Reserve Industries and AMAX Exploration, Inc. and AMAX Gold Inc. (gold exploration in Nevada)
Waterbury Lake Joint Venture, Cigar Lake Deposit, Saskatchewan, Canada (uranium)
Dawn Lake Joint Venture, Saskatchewan, Canada (uranium)
McArthur River Joint Venture, Saskatchewan, Canada (uranium)
L-Bar Grinding and LaPorte Metal Processing Company
Reserve Industries and Rossborough Corp (steel manufacturing products)
Reserve Oil & Minerals and Phelps Dodge Corporation (uranium)
McCoy Mining and Newmont Mining Corp (uranium)
Reserve Oil & Mineral and Western Nuclear Corp and Goldfield Corp (uranium)
Other joint mineral exploration ventures in California, Arizona, Colorado and Washington

Equity interests:

Rossborough Manufacturing Company (products and services to the steel and foundry industries)
Rossborough Manufacturing Co. L.P. (products and services to the steel and foundry industries)
JPL Industries Pte. Ltd., Singapore (industrial waste processing)

6.2 Who is Reserve Silica Corporation?

Mined sandstone to be processed. (Gene Criss, 2007, myspace.com)

Reserve Silica Corporation is a wholly owned subsidiary of Reserve Industries Corporation of Albuquerque, New Mexico. Reserve Silica is a Washington corporation, formed July 1990. Corporate officers are listed as Frank Melfi, President; William Melfi, Vice President/Secretary/ Treasurer; James Melfi, Chairman.[1]

Reserve Silica assumed the silica sand mining lease for the Ravensdale site from its sister company, L-Bar Products, Inc., probably in 1990 (or possibly 1991, but in any case, before

L-Bar Products closed its embattled Chewelah, Washington magnesium processing plant and filed for bankruptcy in 1992).[2,3] L-Bar Products was a wholly owned subsidiary of Reserve Industries,[4] and operated the Ravensdale site from March 1986 until transferring the silica sand mining lease to Reserve Silica. After assuming this lease from L-Bar, Reserve Silica continued the strip mining and processing of silica sand for use in cement and glass manufacturing, golf course bunker sand, and plant nurseries. Reserve Silica finally purchased the property from Glacier Park Co. (subsidiary of Plum Creek Timber Co.) in 1997.[5] Reserve Silica extracted hundreds of thousands of tons of sandstone/silica sand material from the site before the completion of active strip mining operations in December 2007.[6] Since 2007, Reserve Silica has been selling off the stockpiled silica sand, which is now virtually depleted. In 2007 Reserve Silica began backfilling in earnest the huge depleted mining pits on the site[7] with materials excavated from various construction sites and projects around the region. Reserve Silica anticipates backfilling of the mining pits will be completed by the end of 2016,[8] undoubtedly due in part to the approval just received in February[9] for the disposal of concrete from the old SR 520 Evergreen Point Floating Bridge at the Ravensdale site.


Mining activities. (Gene Criss, 2007, myspace.com)

Development Proposals for the Ravensdale Site

As the Reserve Silica site in Ravensdale nears the end of its life as an active mining and fill site, King County Codes would say that this site should revert to a Forest zoning, compatible with the surrounding zoning and land use, and in accordance with its Forest zoning[10,11,12] prior to its purchase by Reserve Silica in 1997. However, in 2011, Reserve Silica submitted a proposal to the King County Council requesting to up-zone a portion of the site from mining classification to RA-10 rural residential, with a plan to create a 32-unit housing development on the site.[13] When this plan met with resistance from the King County Exec's Office, which recommended the property be returned to Forest zoning, Reserve submitted a revised proposal in 2012 to up-zone the entire site and now create a 40-unit housing development.[14] Ultimately, a compromise amendment, I-203, was approved by the Council as part of the 2012 Comp Plan allowing Reserve Silica to submit a proposal for a Demonstration Project involving transfer of development credits from lands in the vicinity that form the headwaters of critical, high valued habitat area, or that remove the development potential from nonconforming legal parcels in the forest production district, or that provide linkages with other forest production district lands.[15] The intent of this compromise was to transfer the 18 development credits from nonconforming legal parcels in the nearby (1/2 mile away) Section 6 (Twp21N, Rng07E) property in the Forest Production District (FPD) formerly belonging to Weyerhaeuser Company that is the headwaters of both Rock Creek (Cedar, WIRA 8) and Thirty-one Man Creek (Green/Duwamish, WIRA 9), thus permanently protecting this 638 acre property located in the FPD at the heart of Ravensdale Ridge.[16]


Mining activities. (Gene Criss, 2007, myspace.com)

When attempts by Reserve Silica to acquire these development credits from the current property owner were unsuccessful,[17] Reserve Silica chose, instead, to purchase a 141-acre property[18] zoned RA-5 in Section 24 (Twp21N, Rng06E) adjacent to the south side of the City of Black Diamond (2 ¼ miles away) as a TDR sending site.[19] This property was purchased by Reserve Silica in June 2014.[20] In March 2016, Reserve Silica transferred ownership of this Black Diamond property to a newly created wholly owned subsidiary of Reserve Industries, Reserve Properties, LLC.[21] This new sister company to Reserve Silica was just formed in February 2016.[22]


Fill material dumped over rim of mining pit.
(reservesilica.com)

Reserve Silica has now come forward with a proposal to create a 72-unit housing development on the Ravensdale site consisting of 9 clusters of 8 homes each, located on two portions of the property. Two variations of this TDR/up-zone proposal have been suggested. In brief, these proposals are:

1.) Upzone the Ravensdale site to RA-10; transfer 25 of the available 28 development credits from its Black Diamond Section 24 property to the Ravensdale site (a rural-to-rural transfer); purchase 9 TDRs from the King County TDR bank; build a 72-unit housing development at Ravensdale; place 126 acres of Section 24 under conservation easement, and sell remaining three 5-acre parcels on Section 24 for residential development.[23]


Reserve Silica sand processing plant adjacent to Ravensdale Lake, 2016

2.) Donate 25 of the available 28 development credits from the Black Diamond Section 24 property to the King County TDR bank; up-zone the Ravensdale site to RA-5; build a 72-unit housing development at Ravensdale; (presumably) sell or donate the three extra development credits from the Ravensdale site to the King County TDR bank; place 126 acres of Section 24 under conservation easement, and sell remaining three 5-acre parcels on Section 24 for residential development.[24]

Environmental and Hazardous Waste Concerns at the Ravensdale Site

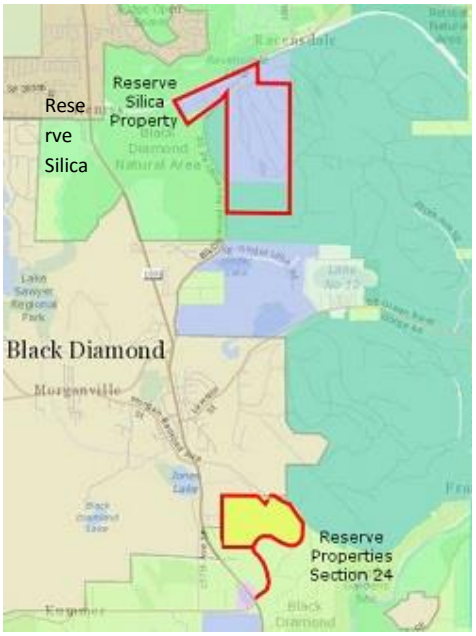
There are a number of major environmental and hazardous waste concerns at the Reserve Silica Ravensdale site. These are covered in detail in the "Environmental Risks and Human Health Hazards" section of this document, but the Washington State Department of Ecology (WDOE) hazard ranking of this site as a class 1 priority (highest ranking possible) MTCA clean-up site for its potential threat to human health and/or the environment relative to all other Washington State hazardous sites [25] is evidence of the seriousness of these concerns –


Portion of Reserve Silica Ravensdale fill site.
(reservesilica.com)

especially considering that this ranking was based solely on an assessment of leachate from a single hazardous material (cement kiln dust) known to have been dumped in two specific areas of the site (Lower Disposal Area and Dale Strip Pit). A full site assessment beyond the known CKD disposal areas has not been conducted despite the fact that the property was listed as a landfill until December 1999;[26] has groundwater, soil and surface water contamination by metals and corrosive waste;[27] has had numerous permit violations[28] and citizen complaints;[29] and even WDOE's own statement that other mine pits on the site were filled with unknown materials.[30] Consequently, the full extent of hazardous waste dumping and toxins on the site is presently unknown and needs further study.

6.3 Who is Reserve Properties, LLC?

Reserve Properties, LLC is a wholly owned subsidiary of Reserve Industries Corporation, and sister company to Reserve Silica Corporation. Reserve Properties was formed February 19, 2016. Incorporation papers filed with the Washington Secretary of State list Frank Melfi as Manager.[1] Frank Melfi is also President of both Reserve Industries and Reserve Silica.



Relative location of Reserve Silica Ravensdale site to Reserve Properties Section 24 TDR site. (King County Parcel Viewer)

In June 2014, Reserve Silica purchased a 141-acre property located in Section 24 (Twp21N, Rng06E) adjacent to the south city limits of the City of Black Diamond.[2] This property, formerly owned by Weyerhaeuser Company, is zoned RA-5 and has been approved for 28 residential lots. The property was logged and replanted by Weyerhaeuser in about 2012.

Reserve Silica purchased this Section 24 property as an alternative TDR sending site for their proposed 72-unit housing development on the Ravensdale silica sand site after attempts to purchase the 18 TDRs from the Forest Production District lands in Section 6 (Twp21N, Rng07E) located just ½ mile from the Ravensdale site, were unsuccessful.

On March 14, 2016, just a month after forming Reserve Properties, LLC, Reserve Silica transferred ownership of the Black Diamond Section 24 property to Reserve Properties,[3] so this property is no longer an asset of the Reserve Silica subsidiary of Reserve Industries Corporation.

6.4 Who was L-Bar Products, Inc.?

L-Bar Products, Inc. was a wholly owned subsidiary of Reserve Industries Corporation.[1] L-Bar Products became the owner of the assets of Industrial Mineral Products, Inc. of Ravensdale (IMP) when Reserve Industries purchased those assets in March 1986.[2] At the time of its incorporation, it appears L-Bar

Products maintained the continuity of operations from IMP, retaining Victor J. Hoffman as President [3,4] and Ronald J. Roman as Vice President.[5] However, these executive roles changed at some point as Frank C. Melfi and brother William J. Melfi are later named as the executive officers of L-Bar Products,[6] Frank Melfi, President.[7]

Among the IMP assets acquired by L-Bar in 1986 was the mining lease for the Ravensdale silica sand site and a magnesium recovery plant in Chewelah, Washington[8] (formerly operated by Phoenix Resources Recovery, a wholly owned subsidiary of IMP[9,10]). See detailed write-up, Who Was Industrial Mineral Products, Inc.

Ravensdale Site

L-Bar operated the Ravensdale Site from 1986 until ca. 1990 when the lease was apparently transferred to L-Bar's sister company, Reserve Silica Corporation (formed in July 1990 as another wholly owned subsidiary of Reserve Industries [11,12]). L-Bar mined, washed, screened and dried silica sand from the site. This sand was sold for cement and glass manufacturing and fiberglass.[13,14,15] L-Bar Products also continued using portions of the site for the disposal of cement kiln dust from the Ideal Cement plant in Seattle [>Holnam>Holcim].[16] This dumping of cement kiln dust, begun in 1979 by IMP, continued under L-Bar's (Reserve Industries) management from 1986 to 1989.[17]

Chewelah Site

L-Bar Products operated the Chewelah magnesium recovery plant from 1986 until closing the plant in 1991.[18,19] The plant purchased and processed industrial waste in the form of magnesium flux bars from the nearby Northwest Alloys (NWA) magnesium smelter, recovering magnesium granules from the waste for use in steel manufacturing,[20] and creating a powdery material called flux bar residue. L-Bar stockpiled both flux bar and flux bar residue on the Chewelah site.[21] During its tenure, L-Bar was cited numerous times for improper hazardous waste handling and for violation of air, water quality, and dangerous waste regulations.[22,23] L-Bar was cited for violations by both the Washington Department of Ecology (WDOE) and the U.S. Environmental Protection Agency (USEPA), including a civil suit filed by the WDOE in 1988.[24,25]

Current view of L-Bar Products Chewelah magnesium recovery site on Hwy 395 south of Chewelah. Colville River at upper right. (Google Earth)

Criminal charges were filed by the USEPA against L-Bar Products, Inc. and two of its plant managers in 1995 under a federal grand jury indictment for illegally burying barrels containing hazardous sulfuric acid wastes on the site in 1990.[26,27] The charges included *"two counts of conspiracy to unlawfully store and dispose of hazardous waste, one count of unlawful disposal of hazardous waste, one count of unlawful storage of hazardous waste, one count of unlawful release of hazardous waste and three counts of making a false statement to a government agency"*[28] While *"L-Bar president Frank Melfi, reached at the Albuquerque, N.M., office of L-Bar's parent company, Reserve Industries Inc., said he hadn't seen the indictment and declined to comment,"*[29,30] then State Attorney General Christine Gregoire was quoted as saying, "*I want to emphasize that these criminal charges are not the result of a business inadvertently*

doing the wrong thing. Our investigation revealed that L-Bar officials decided to illegally dump the chemicals after exploring proper disposal options." And, "*While most businesses work to comply with environmental laws, L-Bar tried to cut its operating costs by thousands of dollars by burying wastes out on the back forty.*"[31,32] Ultimately, the plant managers pled guilty and received probation for their roles in this, but charges against L-Bar/Reserve Industries were dismissed after the case did not come to trial in a timely manner while the prosecutors were focused on bankruptcy claims against L-Bar.[33,34,35]

In addition to selling the recovered magnesium granules to the steel industry, L-Bar Products also sold the hazardous magnesium flux bar residue, a byproduct from its magnesium recovery process, as agricultural fertilizer[36] and road deicer.[37,38] The same material was sold for both uses – the fertilizer under the brand names Cal Mag, Ag Mag, and Al Mag, and the deicer as Road Clear.[39] This was done legally by labeling the hazardous material as a "product," thus exempting it from hazardous waste regulations.[40,41,42] Concerns regarding the fertilizer's safety were raised,[43] and crop failures were attributed to the use of the fertilizer.[44] An analysis of the product characterized it as volatile, unpredictable, unsafe, and potentially poisonous to farmlands; and that advertising materials were "designed to deceive."[45,46,47]

L-Bar closed the Chewelah plant without notice in December 1991.[48] The reason reported at the time was that L-Bar's only customer for their recovered magnesium granules stopped payment on a $900,000 contract, thus leaving the company with no operating funds.[49] Records indicate that the company stopping payment, Rossborough Manufacturing, was 50% owned by Reserve Industries, L-Bar's own parent company.[50,51,52] By July 1992, L-Bar declared Chapter 11 bankruptcy, and in March 1995 entered Chapter 7 bankruptcy.[53] At the time of closing, an estimated 100,000+ tons of hazardous flux bar and flux bar residue wastes from the magnesium recovery operation were stockpiled on the site.[54,55,56] The company was also facing fines and costly remedial actions stemming from the 1988 civil suit brought by WDOE and from a 1989 violation of state hazardous waste regulations.[57,58] (The USEPA criminal case had not yet been filed as the matter of the illegally buried sulfuric acid barrels had not yet come to light at the time of the plant closure.)

Following closure of the plant, WDOE continued to hold L-Bar Products and its parent company, Reserve Industries, liable for cleanup of the site as the owner and operator of the magnesium recovery plant; and it also held NWA (a subsidiary of Alcoa) liable as the original producer of the magnesium flux bar material. It was determined that magnesium flux bar processing at the site had caused soil, groundwater, and surface water contamination.[59] It was also found that toxins from the site were entering the nearby Colville River.[60,61,62]

Reserve Industries claimed it was not liable for the contamination at the L-Bar site stating that L-Bar Products was a separate entity from Reserve Industries,[63] albeit their wholly owned subsidiary. Ultimately, Reserve Industries was party to the L-Bar bankruptcy settlement reached in 1999, under which NWA assumed responsibility for site cleanup, with a cost estimate of $10 million (NWA had already voluntarily begun cleanup of the site five years prior to the bankruptcy settlement).[64,65] In addition, NWA assumed the responsibility for paying the 56 employees who had not received their final

wages from L-Bar Products when the plant closed in 1991.[66,67] In turn, title to the Chewelah plant site was turned over to NWA as settlement of NWA's claims against L-Bar Products.[68] NWA had already voluntarily cleaned up the hazardous fertilizer/road deicer left in seven warehouses in Eastern Washington and the Willamette Valley when L-Bar broke the warehouse leases and abandoned the material as a "burdensome asset."[69]

As of 2002, NWA had completed removal of the flux bar and flux bar residue stockpiled at the site and the site is now subject to compliance monitoring under WDOE oversight to detect any worsening levels of surface or ground water contamination that would necessitate further cleanup of the site.[70] The site is also under a restrictive easement limiting future land use to industrial or commercial purposes, with one portion limited to agricultural use, provided such uses do not cause further contaminant release.[71]

6.5 Who was Industrial Mineral Products, Inc.?

Industrial Mineral Products, Inc. (IMP) was a corporation headquartered in Ravensdale, Washington involved in mining and industrial waste processing. Principals of IMP included Victor J. Hoffman, President; Ronald J. Roman, Vice President; and Arthur B. "Bud" Berg, Manager.[1,2,3,4] IMP acquired the mining lease for the Ravensdale silica sand site in 1972.[5] IMP operated the Ravensdale site from 1972 to March 1986, at which time IMP sold its assets to L-Bar Products, Inc., a wholly owned subsidiary of Reserve Industries Corporation of Albuquerque, New Mexico (and sister company to Reserve Silica).[6]

Trademark registered 1982 by Industrial Mineral Products, Inc., Ravensdale, Washington.

Ravensdale Connection

IMP mined silica sand from the Ravensdale site under lease from Burlington Northern Timberlands (predecessor to Plum Creek Timberlands) from 1972 to 1986. Silica sand was processed at the Ravensdale site and sold primarily for concrete and glass manufacturing. IMP had an arrangement with Ideal Cement Company (Holnam>Holcim) located on the Duwamish Waterway in Seattle whereby IMP sold silica sand (and ASARCO slag) to Ideal Cement and Ideal Cement in turn disposed of their cement kiln dust (CKD) at two locations on the Ravensdale site.[7] Those locations are now known as the Lower Disposal Area [LDA] and Dale Strip Pit [DSP]. Dumping of CKD occurred from 1979 until 1986[8] when IMP's assets were purchased by L-Bar Products, Inc., a wholly owned subsidiary of Reserve Industries. Following the purchase, L-Bar Products continued the sale of silica sand to Ideal Cement and the dumping of CKD on the Ravensdale site until 1989.[9]

ASARCO Connection

From its Ravensdale headquarters, IMP operated a number of businesses and subsidiary companies, both in the United States and overseas. One of these businesses, operated through IMP's subsidiary, Black Knight, Inc., had an exclusive contract to purchase copper slag from the ASARCO smelter in

Tacoma.[10] IMP processed this slag and sold it for a wide range of purposes including feedstock for cement manufacturing, road ballast, driveway gravel, fill material, and decorative rock.[11,12,13] These products were sold throughout the region, but one of the most noted uses of IMP's copper slag products was as road ballast in the log sort yards around the Port of Tacoma.[14] It was found that the copper slag, when mixed with the organic materials in the wood debris in the sort yards, leached heavy amounts of arsenic and other toxic materials.[15] In the lawsuits and countersuits determining liability for cleanup of the Port areas, IMP was sued as a potentially liable party by ASARCO after ASARCO was sued as liable for the cleanup at the Louisiana-Pacific log sort yard. However, the courts determined that the suit brought against IMP by ASARCO was filed too late after the company's disincorporation, leading to the dismissal of charges against IMP. The delay in filing charges against IMP was due to ASARCO's belief that L-Bar Products, Inc. (Reserve Industries), having purchased the assets of IMP, was the successor in liability to IMP. ASARCO thus initially filed their suit against L-Bar Products, but the courts ruled that L-Bar could not be proved as successor in liability under CERCLA rules. (CERCLA – the Comprehensive Environmental Response, Compensation, and Liability Act - was relatively new and largely untested in the courts at that time.) Ultimately, neither IMP nor L-Bar were held financially liable for cleanup of ASARCO slag distributed by IMP.[16]

It has been stated that ASARCO slag found its way to the Ravensdale site. Though documented proof seems to have been lost, it is highly probable that IMP would have utilized their own road ballast and gravel products on their own roads at the Ravensdale mine site since they were selling these products to other industrial operators for that purpose. In a 1983 visit to the Ravensdale site, Greg Wingard states in his trip report having picked up two pieces of copper slag from a road on the Ravensdale site.[17] He reports submitting this sample to the Washington Department of Ecology (WDOE), but results of any testing done by WDOE could not be found during a 2013 Public Records request.[18] However, Mr. Wingard recalls the samples were sent to WDOE's Manchester Laboratory which confirmed the samples were very high in arsenic and that the slag was from ASARCO.[19] A former worker on the Ravensdale site also reported in 2004 having been told by older workers at the site that ASARCO slag was dumped on the site, along with oil from heavy equipment, but no apparent follow-up of this report has been found in WDOE records either.[20]

Chewelah Connection

Another business run by IMP was a magnesium recovery plant in Chewelah, Washington. This business was operated by IMP's subsidiary, Phoenix Resources Recovery (PRR).[21,22,23] The plant area, now commonly referred to as the L-Bar Site after it was purchased in 1986 by Reserve Industries through its subsidiary, L-Bar Products, Inc., has been the focus of numerous environmental complaints, first against PRR and then against L-Bar Products.[24,25] The magnesium recovery process involved grinding flux bars (the waste product from the Northwest Alloys [Alcoa subsidiary] magnesium smelting plant in Addy, Washington. The ground material was sifted to remove magnesium granules, which were sold for use in steel manufacturing.[26] The fine powdery residue of this grinding process, called flux bar residue (FBR), was stockpiled on the site and later marketed as both an agricultural fertilizer and a road deicer (same material).[27] PRR initially announced plans to market the FBR as fertilizer,[28,29] but it was after purchase of the plant by Reserve Industries/L-Bar Products that the marketing of fertilizer and road deicer

apparently began in earnest. (Ronald J. Roman, Vice President of PRR and then L-Bar Products, received a patent for the road deicer formula "Road Clear" in 1987, noting in the patent application that this could be used as agricultural fertilizer as well. This patent was assigned to L-Bar Products, Inc.)[30]

Following closure of the Chewelah plant by L-Bar in 1991, the site has been the focus of a major cleanup effort by the WDOE. This cleanup effort has been managed by Northwest Alloys, which assumed responsibility for the cleanup as part of the L-Bar Products bankruptcy settlement in 1999.
IMP was dissolved in December 1986 following the sale of its assets to Reserve Industries' subsidiary L-Bar Products, Inc. in March 1986.[31,32]

NOTES AND REFERENCES

Abbreviations:

SEC – Securities and Exchange Commission
USEPA – U.S. Environmental Protection Agency
WDOE – Washington Department of Ecology

2.2 What is the Magnitude of the Likely Forest Reclamation Costs?

[1] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Introduction, pg. 1.

[2] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C.

[3] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012., Appx. G.

[4] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012., Appx. G, pg. 6.

[5] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C. pg. 5.

[6] Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012.

[7] Reitenbach, Paul: Senior Policy Analyst, DDES. Letter to KC Council TrEE Committee. July 26, 2012. Pgs. 2, 3, & 4.

[8] Rural Forest Commission. Letter to Larry Gossett, King County Council Chair. October 17, 2012.

[9] American Forest Management. *Forest Management Plan Reserve Properties*. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. I.

2.3 Assessment of Reclamation Costs

[1] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 5.

[2] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012, Appx. G., pg. 6.

2.3b Forest Reclamation Assumptions

[1] Arkansas Timber Info. *Herbicide Applications.* www.arkansastimber.info

[2] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 8.

[3] Reserve Silica Corporation website, June 15, 2016. http://www.reservesilica.com/

[4] Melfi, Frank: President of Reserve Silica and Reserve Industries (parent company of Reserve Silica). Personal conversation with Michael and Donna Brathovde. May23, 2016.

[5] Transpo Group. *Draft Memorandum*. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. F.

[6] Smail, Derek. Personal communication. 2015.

[7] White, Fred: Site Development Specialist, King County DPER. Personal communication. 2015.

[8] Brathovde, Michael: Forterra Volunteer Land Steward Ravensdale Ridge. Monitoring data for Wagner/Erickson property. 2016.

[9] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. H: *Interim Reclamation Plan for the Ravensdale Quarry;* Figure 5.

[10] Vrablick, Brian J.: Forestry Project Manager, King County WTD. Email communication. June 14, 2016.
[11] Washington Department of Natural Resources. *Forest Practices Act FPAR applications, Erickson Logging*.

2.4 Estimate of Total Forestry Reclamation Cost

[1] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. H: *Interim Reclamation Plan for the Ravensdale Quarry.* Pg. 1.

2.5 Hasn't This Property Always Been Primarily a Mining Site?

[1] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Introduction, pg. 7.
[2] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 2.
[3] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 2: Dale/Continental Coal Co processing plant.
[4] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 2: Dale/Continental Coal Co processing plant plus Dale strip mine.
[5] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 30. Calculation includes DSP plus LDA plus 3 active mine pits plus coal tailings plus plant site and clay tailings ponds.
[6] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 2.
[7] Friends of Rock Creek Valley. Rock Creek Valley Conservation Plan and Priorities. 2004.
[8] Aerial photography, 1980 and 1985.
[9] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 2.
[10] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 3.. Based on 1936 aerial photography available on King County iMap.
[11] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 4.
[12] City of Kent Wellhead Protection Program. Fig. 4-1: *Land Use Zoning and Relevant Features Map, Nov 1995.* April 2, 1996. City of Kent Wellhead Protection Program
[13] Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Introduction, pg. 16.
[14] Rural Forest Commission. Letter to Larry Gossett, King County Council Chair. October 17, 2012.
[15] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 4.

2.6 Is Proposal Compatible with Surrounding Land Uses and Supported by Adjacent Property Owners?

[1] Reserve Silica Rural Mining Site Conversion Project. Project Summaries dated April 6, 2016 and May 1, 2016. Pgs. 1
[2] Reserve Silica Land Use Study. March 9, 2011. Pg. 16.
[3] Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. A: Carl Sanders; Appx. B: Hal Read; and Appx. E: Fred Wagner.
[4] Powell, Chris. Letter to Paul Reitenbach, 2012 KC Comp Plan Mgr. May 3, 2012.
[5] Ridley, Lisa: P&D Logging Business Administrator. Text message to Michael Brathovde, May 29, 2016.
[6] Black Diamond Natural Area, Henry's Ridge Open Space, Cemetery Reach Natural Area, Forterra conservation easement on Wagner/Erickson and Rigby properties.

[7] Powell, Chris. Letter to Paul Reitenbach, 2012 KC Comp Plan Mgr. May 3, 2012.
[8] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Introduction, footnote pg. 1.
[9] Reserve Silica Corporation and Holcim (US) Inc. *Easement Agreement Involving Site Environmental Activities.* King County Recording no. 20110127000636.
[10] Reitenbach, Paul: Senior Policy Analyst, DDES. Letter to KC Council TrEE Committee. July 26, 2012.

2.7 Doesn't Reclamation for Forestry Conflict with the IFC and UW Study Conclusions?

[1] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C.
[2] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012, Appx. G.
[3] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012, Appx. G, pg. 6.
[4] King County Rural Forest Commission. Letter to Larry Gossett, King County Council Chair. October 17, 2012.

2.8 Does This Property Meet GMA and King County Criteria for 'Forest Land of Long-Term Commercial Significance'?

[1] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Introduction, pg. 1.
[2] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 29.
[3] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012, Appx. G, pg. 14.
[4] Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Introduction, pg. 3.
[5] Ryon, Dick. King County Rural Forest Commission, September 8, 2011 meeting notes, pg. 2.
[6] Sale of Hancock White River Tree Farm to Muckleshoot Indian Tribe, for whom timber production is not their primary management objective.

2.9 Why is Reserve Promoting Conversion to Rural Residential Development?

[1] Muyskens, J. D. Personal conversation regarding typical offers for approved, but unpermitted housing sites on rural lands surrounding the Vancouver, Washington area in 2015. Offers averaged ~$32,500/lot. Housing prices in King County have been running significantly higher than in the Vancouver, WA area, and SE King County housing prices have risen over 10% over the past year; leading to estimated 2016/2017 undeveloped lot prices in King County at ~$40K/lot.

2.10 Who Would Buy These Lands From Reserve if Upzone Denied and Property Reclaimed for Forestry?

[1] Melfi, Frank: President of Reserve Silica. Personal conversations on several occasions with Michael and Donna Brathovde. 2015 and 2016.
[2] Melfi, Frank: President of Reserve Silica. Personal conversation with Michael and Donna Brathovde. May 23, 2016.
[3] International Forestry Consultants, Inc. *Forestry Analysis.* Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 24.

3.2 What are the Environmental Risks and Human Health Hazards at the Ravensdale Reserve Silica Site?

[1] WDOE. Reserve Silica Site Hazard Assessment, Worksheet 1. January 2016. https://fortress.wa.gov/ecy/

[2] Holcim/Reserve Silica Easement Agreement dated Aug 27, 2002. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. D, pg. 1.

[3] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015*. Reserve Silica Demonstration Project Proposal, May 1, 2016. Appx. K, pg. 10.

[4] Model Toxics Control Act, Chapter 70.105D RCW.

[5] WDOE. Recommendation for Enforcement Action, Water Quality Program. Reserve Silica, Permit No. WAG 503029. June 21, 2016. https://fortress.wa.gov/ecy/

[6] WDOE. Reserve Silica Site Hazard Assessment: Facility Site ID #2041. Letters dated January 25, 2016 and February 29, 2016. https://fortress.wa.gov/ecy/

[7] WDOE. Reserve Silica Notice of Violation No. 13466. June 29, 2016. https://fortress.wa.gov/ecy/

3.3 Cement Kiln Dust (CKD)

[1] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015*. Reserve Silica Demonstration Project Proposal, May 1, 2016. Appx. K, pg. 5.

[2] WDOE. *Lower Duwamish Waterway – Cement Kiln Dust: Summary of Existing Information.* April 2015. Cement Kiln Dust: Summary of Existing Information - Washington State DOE

[3] Wilson, Duff. Fateful Harvest: The True Story of a Small Town, a Global Industry, and a Toxic Secret. HarperCollins, New York. 2001.

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The report goes on to summarize concerns about the Leachate as follows: *Although the LDA and Dale Strip Pit have been capped and a legal agreement with Holcim is in place for continued liability, leachate from the LDA and Dale Strip Pits continue to present an environmental concern for impacts to groundwater, soil, and the exposure to leachate. Leachate (in the form of surface water) is seeping out of the west side of the LDA, and west of the LDA into collection ditches, which fall outside of the conveyance infrastructure in the marsh areas, the south pond area, and in the infiltration ponds (Public Health – Seattle & King County 2014). Although the conveyance and infiltration facilities are in place, the capture of leachate within collection ditching and inlet infrastructure has not been reliable. The uncontrolled nature of the leachate and impacted surface waters result in exposure pathways impacting human health and the environment that could be an ongoing concern depending on future land use type. Although Holcim carries liability for the CKD filled pits, they have not provided complete control of the contamination impacts."*
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[2] Staff Comments. WDOE Water Quality Program meeting. June 27, 2016. (In attendance: Jerry Shervey, Chris Martin, Madeline Wall, and Biniam Zelelo of WDOE; Dan Dhillon of Seattle & King County Public Health.)

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[3] King 5 News, *520 Bridge Demolition Plan Moves From Kenmore To Lake Washington,* May 24, 2016; http://www.king5.com/news/.
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3.5g Was Industrial Waste "Fertilizer" Applied to Portions of the Site?

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3.7 Risks to Human Health and the Environment Posed by Residential Development on the Site

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[4] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. D: Proposed Conservation Easement. Pg. 3.
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[8] Reserve Silica Rural Mining Site Conversion Project. May 2016. Appx. C: Declaration of Covenants, Conditions, Restrictions, and Easements, Articles 5.1.18, 6.4 and 7.1, pgs. 7 and 12.
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[20] Environmental Research Foundation. *Cement and Kiln Dust Contain Dioxins.* http://www.ejnet.org/

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