III. ASSESSMENT OF CASE STUDY ALTERNATIVES

A. INTRODUCTION

LG&E's application for a 404 permit contains an Alternatives Analysis that is provided here as a Support Document in Section I. The analysis demonstrates the process by which LG&E concluded there is no alternative to the Ravine B landfill that: i) is practicable; ii) has less impact on the aquatic ecosystem; iii) does not have other significant adverse environmental consequences; and iv) provides the ratepayers with a 37 year landfill with the financial and operational stability that is critical to LG&E as a regulated utility in the Commonwealth of Kentucky. LG&E has concluded that for CCR disposal from the TC Station, the Ravine B landfill is the Least Environmentally Damaging Practicable Alternative, or LEDPA.

In its comment letters, EPA requested more information on LG&E's analysis.

- In its letter of July 11, 2014 (Appendix I.E-1), EPA asked for an analysis that would "more clearly and completely describe the process by which the least environmentally damaging practicable alternative was identified". EPA stated that LG&E had overly relied on "undocumented or undefined cost information and with very little to no comparative analysis of the range of environmental impacts associated with different alternatives ...." EPA also emphasized the need for LG&E to fully explain its decision criteria involving "excessive" or "unreasonable" costs.
- In its letter of August 7, 2014 (Appendix I.E-2), EPA specifically requested that LG&E "undertake a thorough and transparent analysis of alternatives and associated environmental impacts to ensure that the LEPDA can be selected".

Further, EPA has put forth two specific alternatives that the agency apparently considers could be the Least Environmentally Damaging Practicable Alternative.

- In its letter of July 11, 2014, EPA identified Lee Bottom, located in Indiana, as an example of a disposal site that LG&E had rejected based on undocumented cost considerations and for which additional analysis "may be warranted".
- In its letter of August 7, 2014, EPA identified a "potentially feasible alternative not considered by the applicant". This alternative would involve disposal of CCR in an underground limestone mine in Gallatin County, Kentucky. The mine is owned and operated by Sterling Ventures, LLC, and is now only permitted for management of CCR synthetic gypsum.

Section III of this Supplement presents case studies that are responsive to EPA's request for additional assessment of alternatives. The case studies provide an expanded analysis and comparison of four alternatives, which are referred to as follows: Ravine B (full name Ravine B Landfill); Lee Bottom (full name Lee Bottom Landfill); Sterling Ventures (full name Sterling Ventures Mine); and Valley View (full name Valley View Municipal Solid Waste (MSW) Landfill). Figure III.A-1 is a map showing the location of each case study alternative.

Of the four alternatives, one is the LEDPA as determined by LG&E (Ravine B) and two are those identified by EPA (Lee Bottom and Sterling Ventures). The fourth alternative, Valley View, is an existing permitted

solid waste landfill and was added to the list of case study alternatives for two reasons. First, it is similar in many ways to Sterling Ventures, but is much closer to TC Station and is already permitted as a lined and monitored contained landfill. And second, interim disposal at the Valley View facility cannot be excluded as a possibility if Ravine B or another alternative is not available by 2018. Thus the costs and impacts of the alternative are potentially germane to LEDPA considerations.

LG&E has taken a case study approach because it facilitates in-depth discussion of the issues relating to analysis of alternatives. In particular, two aspects of the evaluations provided in Section III are different from those previously provided to USACE and EPA.

- Previously, once an alternative was judged not practicable (due to logistics or cost), no further evaluation was performed as provided by the 404(b)(1) guidelines. Here, logistics, costs and environmental impacts are discussed for all four case studies, even if an alternative would appear to be impracticable based on logistics or cost alone. This approach is comparable to an abbreviated NEPA process and is intended to provide EPA with the thorough and transparent analysis of alternatives that was explicitly requested in the August 7 letter, even though such additional analysis is not required under EPA's 404(b)(1) guidelines.
- The focus on case studies allows the methods used in the evaluation to be presented in more detail and with more back-up documentation than previously provided.

Collectively, the case studies have produced a large volume of documentation, with most details provided in appendices or as Support Documents in the DVD provided with this report.

The remainder of Section III is organized as follows.

- Section III.B provides a brief description of the four case study alternatives.
- Section III.C provides the evaluation of each case study alternative with respect to logistical issues.
- Section III.D presents an analysis of the construction and operational costs of each case study alternative.
- Section III.E summarizes the most substantial environmental impacts that are expected to result from each case study alternative.
- Section III.F describes the basis upon which LG&E has determined which of the four case study alternatives is the LEDPA.

B. DESCRIPTION OF CASE STUDIES

Information on each alternative is provided in an appendix: Appendix III.B-1 for Ravine B, Appendix III.B-2 for Lee Bottom, Appendix III.B-3 for Sterling Ventures and Appendix III.B-4 for Valley View.

Ravine B. Case study alternative Ravine B would involve construction by LG&E of a CCR landfill and ancillary facilities in a watershed adjacent to and east of TC Station. The project would reflect

construction and operation principles for CCR management developed by LG&E over several preceding decades. The description of the Ravine B alternative is provided in Appendix II.B-1 as part of the evaluation of aquatic resources in the drainage. The site attributes of Ravine B potentially most relevant to evaluation of a CCR project are identified in the context of the logistical evaluation of the site; see Table III.C-1.

Figure III.B-1 is a map illustrating the conceptual design of this alternative. Additional detail is provided in Appendix III.B-1. The conceptual design follows the process described in Appendix III.C-1. It meets all regulatory requirements for a liner and a drainage system to collect leachate, and includes facilities to provide for leachate treatment and storm water/sediment retention. The footprint of the landfill avoids all but a few small karst features, as well as a cemetery and a historical site. The 345kV transmission line must be relocated.

An approximately 1.5-mile transportation corridor would be constructed on the south side of the project area and would contain both the pipe conveyor and haul road. Transfer and storage facilities would be built at the corridor terminus, with an approximate average 1-mile round-trip for truck transport of CCR to its disposal location. No CCR transport would occur on public roads or waterways.

Lee Bottom. Case study alternative Lee Bottom is located in southern Indiana and would involve construction of a CCR landfill and ancillary facilities on an Ohio River terrace that is upstream of TC Station. The description of the Lee Bottom alternative is provided in Appendix III.B-2. The site attributes of Lee Bottom potentially most relevant to evaluation of a CCR project are identified in the context of the logistical evaluation of the site; see Table III.C-1.

Figure III.B-2 is a map illustrating the conceptual design of this alternative. Additional design detail is provided in Appendix III.B-2. The conceptual design follows the process described in Appendix III.C-1. It meets all regulatory requirements for a liner and drainage system to collect leachate, and includes facilities to provide for leachate treatment and storm water/sediment retention. The footprint of the landfill avoids those features known to be of concern at Lee Bottom, including a cemetery and the incised channel of Lee Creek. The adjacent Lee Bottom Flying Field is not within the landfill footprint, but the analysis assumes the field would be closed as a result of LG&E's acquisition of all property in Lee Bottom and because takeoff/landing patterns could otherwise be impacted by the landfill.

CCR would be transported from TC Station to Lee Bottom by barge along the Ohio River, a one-way distance of about 4 miles. A barge terminal would be constructed for CCR loading at TC Station and for CCR unloading at Lee Bottom. At Lee Bottom, a 0.75-mile haul road would be constructed over open ground and used for truck transport of CCR from the barge terminal to transfer facilities at the landfill. Lengthy truck transport on public roads could be required at times when barge transport is not feasible, as for example if the river is closed to traffic.

Sterling Ventures. Case study alternative Sterling Ventures is located in Gallatin County, Kentucky at the site of an active and privately owned underground limestone mine. It is the furthest away of the case study alternatives. For planning purposes, LG&E assumes regulation of CCR at this location would be as

disposal, not beneficial reuse. The mine currently is permitted for one type of CCR beneficial reuse, gypsum from LG&E's Ghent Generating Station. No gypsum has been introduced to the mine, and Sterling Ventures does not operate any other landfill. The concept put forth by EPA is assumed to include the disposal of all types of CCR in the voids created by the mining process. To LG&E's knowledge this would a first of its kind operation for the array of CCR materials involved, and the nature of applicable regulatory standards is uncertain.

The site description of the Sterling Ventures alternative is provided in Appendix III.B-3. The site attributes of the Sterling Ventures alternative potentially most relevant to evaluation of a CCR project are identified in the context of the logistical evaluation of the site; see Table III.C-1.

Figure III.B-3 is a map illustrating the conceptual design of this alternative. Additional design detail is provided in Appendix III.B-3. Figure III.B-4 is a schematic cross-section to illustrate CCR placement in mine voids. This cross-section assumes CCR placement at three levels within the mine, which are all below the water table. The only construction required related to CCR disposal is a shaft for transfer of CCR from the surface to the subsurface.

LG&E would transport CCR by barge from TC Station to an Ohio River location near Sterling Ventures. Barging would be over a one-way distance of about 55 miles and would require transport through the Markland lock and dam. Two barge terminals would be constructed, one for CCR loading at TC Station and one for CCR unloading at a site near Sterling Ventures. An approximately 2-mile transportation corridor would need to be constructed from the barge terminal at the river to the drop-off location within the mine site. The corridor would contain a pipe conveyor for normal use, and an access road for trucking when the pipe conveyor is out of service. Lengthy truck transport on public roads could be required at times when barge transport is not feasible, as for example if the river is closed for traffic.

Sterling Ventures would take the CCR from the LG&E drop-off point. Details of CCR management from that point forward are not defined, but could involve trucking to a mine shaft, and below ground placement by appropriate equipment. For purposes of providing a cost estimate that can be compared to other CCR alternatives that have a 37 year life expectancy, the analysis here assumes that the project could be built with no requirement now or for 37 years for a liner, leachate management, or water treatment; and that limestone mining will occur over several decades at a rate which always produces void space in excess of disposal volume and ultimately to provide capacity for 33.4 million cubic yards per year. The risks regarding long-term capacity and relating to leachate are discussed separately.

This alternative would not require LG&E to incur costs for landfill construction. The assessment of project costs relies on the mine owner's quote of a tipping fee for accepting and handling final CCR management after LG&E delivery.

Valley View. The Valley View case study alternative is located in southeastern Trimble County, about 14 miles southeast of TC Station in Sulphur, Ky. Valley View is an existing landfill owned by a publicly traded company, Republic Services, the second largest provider of solid waste collection, transfer, recycling and disposal services in the United States. For purposes of providing a cost estimate that can be compared to

other CCR alternatives that have a 37 year life expectancy, the analysis here assumes that the existing solid waste landfill can now accept or can be modified to accept CCR, so long as CCR is not determined to be hazardous waste; and that it has sufficient capacity or can be expanded to provide capacity for disposal of 33.4 million cubic yards per year of CCR. The risks regarding long-term capacity are discussed separately.

The site description of the Valley View alternative is provided in Appendix III.B-4. The site attributes of the Valley View alternative potentially most relevant to evaluation of a CCR project are identified in the context of the logistical evaluation of the site; see Table III.C-1.

CCR would be transported to the landfill site by truck, a one-way road distance of about 14 miles. Travel would primarily occur along State Highway 754 and U.S. 42. Truck traffic would equate to approximately 100,000 vehicles per year, half loaded full to the landfill, and half returning empty. If traffic were limited to six days a week and 12 hours per day, any point along the route would be passed by a truck on the average of about every two minutes during the 72 hours of active transport. A truck loading facility would be constructed for CCR loading at TC Station. Any construction at Valley View would be provided by the landfill owner.

Figure III.B-5 is a map illustrating the conceptual design of this alternative. Additional detail is provided in Appendix III.B-4. Design details related to the landfill itself are assumed to be handled by the site owner. As a contained landfill under 401 KAR Chapter 48, the facility is required to have a composite liner, leachate management facilities, and surface water management facilities. This alternative would not require LG&E to incur costs for landfill construction. The assessment of disposal costs is based on the landfill owner's quote of a tipping fee for accepting and handling final CCR disposal after delivery by LG&E to the landfill via truck on public roads.

C. LOGISTICAL ANALYSIS OF CASE STUDY ALTERNATIVES

Logistical considerations for assessment of alternatives include the physical, regulatory, management or other tangible factors that may bear upon the practicality of implementing a complex project such as a CCR disposal facility, either directly (a site has conditions that indicate a CCR landfill cannot be properly constructed) or indirectly (conditions that affect schedule, cost, or impacts).

GAI has performed the logistical evaluations reported in this Supplement. Their methods are the same as used in their previous evaluations (e.g. Document 1 in Part 1 of the Support Documents). The methods are documented in Appendix III.C-1. The appendix describes the procedure that is followed to provide a conceptual design of a CCR landfill and ancillary facilities for any site which involves new landfill construction. The appendix also identifies key site attributes which are routinely assessed in evaluating alternatives, and the methods used for such assessments. Scheduling impacts reflect LG&E's preferred and potentially necessary date that a new CCR disposal facility become available by 2018.

Table III.C-1 summarizes the results of the logistical evaluation for the four case studies, with a focus on factors that most directly weigh on whether an alternative is practicable, and what it may cost. The

discussion below summarizes LG&E's conclusions regarding the most important aspects of each logistical factor as it applies to the four case study alternatives. Note that in a conventional assessment, logistical factors could determine that an alternative is not practicable. As discussed in Section III.A, this Supplement includes assessment of costs and environmental impacts, regardless of the seriousness of logistical defects.

- Site capacity. Both Ravine B and Lee Bottom have capacity for a landfill capable of storing 33.4 million cubic yards per year of coal combustion residuals. Valley View does not have specifically reserved capacity at this time, but as it is an operating contained landfill permitted under 401 KAR Chapter 48, for purposes of this screening analysis it is presumed to be capable of permit amendments to handle CCR and to add to its capacity. At present, Sterling Ventures has capacity sufficient to store 910,000 cubic yards/year of CCR for approximately 5.5 years. So long as the mine continues to operate, additional capacity is assumed to be generated. However, there is no basis to know if the capacity at any future time beyond five years will be adequate, and recent Sterling Ventures mining rates have not consistently created sufficient void space annually. Given EPA's interest in the Sterling Ventures alternative, LG&E has not excluded the alternative from further consideration despite what may be a fatal flaw, i.e., unverified and uncertain capacity.
- 100-year floodplain. All sites allow for the CCR disposal to occur in a location outside the 100-year floodplain of the Ohio River or a major tributary. For Ravine B the leachate and storm water/sediment ponds would be in this floodplain. For Lee Bottom and Sterling Ventures, barge terminals and transportation facilities would be in the floodplain. For this assessment, LG&E assumes that permitting for small loading facilities required for Ravine B and Valley View would cause no delays, but permitting for the barge facilities needed for the Lee Bottom and Sterling Ventures alternatives would be likely to have an adverse scheduling impact.
- Cemeteries. It is assumed feasible to site landfills in Ravine B and Lee Bottom to avoid cemeteries. Cemetery avoidance is assumed to not be necessary for Sterling Ventures or Valley View.
- Wetlands and streams. The Ravine B alternative would involve more linear feet of jurisdictional stream impacts, but sizeable impacts also would occur for the Lee Bottom and Sterling Ventures alternatives, and possibly Valley View at such time as the landfill is expanded. In all cases wetlands impacts are minor, with fringes of small farm ponds being the most common areas affected. For this assessment, LG&E assumes that all such impacts can be mitigated to the satisfaction of the regulatory agencies. However, the potential impacts associated with the Lee Bottom and Sterling Ventures sites would require the issuance of individual Section 404 permits, which would be likely to affect scheduling.
- Karst features. Design of the Ravine B landfill avoids almost all karst features at the site. Karst has the potential to impact project design in areas underlain by limestone at Lee Bottom and Sterling Ventures.

- Utility lines. Ravine B is the only case study location which is known to require a major utility relocation.
- Prime farmland. Lee Bottom is the only case study location which is expected to raise permitting issues regarding prime farmland.
- Cultural resources. Due to its location on a large Ohio River terrace, Lee Bottom is expected to have significant potential for cultural resources. This can reasonably be expected to extend the time needed to get permits for that location, with an unknown possibility that the site would prove to be not practicable. Cultural resources have the potential to occur – albeit to a lesser extent – along the Sterling Ventures transportation corridor.
- Threatened and endangered species. Forested areas with the potential to have Indiana Bat habitat are expected to occur at all locations. Forested habitat would be most impacted by the Ravine B and Sterling Ventures alternatives. Section 7 consultation with the U.S. Fish and Wildlife Service is already underway for the Ravine B site. Consultation would be needed for the Lee Bottom and Sterling Ventures sites, which could result in permitting delays.
- Mining/quarry areas. It is assumed that disposal below the water table at Sterling Ventures will be acceptable to the regulatory agencies with no requirement for lining or leachate control.
- Travel route and distance. For Lee Bottom, the one-way barge transport distance is 4 miles. For Sterling Ventures it is 55 miles, and requires passage through locks, which presumably increases the risk of barge accidents or river closure to traffic. The trucking distance to Valley View is 14 miles along two-lane roads that are relied on for school bus transport and that have about 170 residential houses along the way. The route follows streams for a considerable distance, increasing the potential that accidental spills could have a significant impact.
- Aesthetics. Lee Bottom would result in the most visible change to the landscape (creation of a major CCR hill on a river terrace), which could prove to be a consideration in the event of condemnation or in permitting.
- Land access and acquisition. For nearly 30 years LG&E has owned all land needed for the Ravine B alternative and for the barge or truck loading facilities needed for the other case study alternatives. Land acquisition is required for the Sterling Ventures transportation corridor and for the entire Lee Bottom facility including the existing air field. For Lee Bottom, the prospect of displacement of an entire rural community in the state of Indiana (as well as an air field that is considered part of the national transportation system) is expected to make land acquisition a prolonged and contentious process with the prospect that condemnation would prove necessary. The legal question of whether LG&E has condemnation powers in Indiana would likely be subject to debate by parties involved in the process.
- Permitting. The landfill construction permitting process for the Ravine B alternative is far along and LG&E considers it reasonable to have all such permits in hand by the end of 2016, with

construction completed on time in 2018. Permitting of a CCR landfill in Indiana (Lee Bottom) could be problematic, given that the CCR comes from out of state and a rural community will be displaced. Both the Sterling Ventures and Valley View options will require amendments to existing permits. For Valley View in particular, this could be contentious given the truck traffic impacts created by that alternative, and the history of citizen opposition to expansion of that landfill.

All alternatives may be impacted to a degree by EPA's final CCR disposal rules, which are scheduled for release in December 2014. Based upon current expectations, Ravine B's landfill design is expected to have the least risk of additional permitting considerations as it is designed to meet the requirements of the new regulations. Potential regulatory controls that may be required at Sterling Ventures cannot now be predicted, which in itself is a concern as to whether it would be prudent to proceed with an unprecedented approach to CCR disposal.

Procurement. Both the Sterling Ventures and Valley View alternatives would require LG&E to pursue a procurement process under KPSC oversight. This process would require many considerations that are beyond the scope of this screening analysis, such as a review of the vendor's experience and determining if the vendor is financially viable, has a safety record that meets LG&E's requirements, and can be selected without a competitive bid. Were either alternative to appear potentially viable, additional assessment would be required before it could conclusively be judged to be practicable.

For LG&E, logistical considerations are particularly important to determining the practicability of an alternative if they represent risks that could adversely affect the utility's ability to provide its customers with electricity in a manner that is reliable, safe, efficient and economic. The risks of the alternatives are considered high if they indicate implementation is uncertain by the target date of 2018, or if the length of time that the alternative may be available for disposal of CCR cannot now be determined. The primary risks associated with each case study alternative are as follows.

- Ravine B. LG&E intends that this Supplement will demonstrate that there are no aquatic resources of national importance in Ravine B and that reasonable alternatives to Ravine B have been evaluated and found to be not practicable. LG&E has not identified any risk that would preclude having this alternative operational by the target date of 2018.
- Lee Bottom. This alternative is considered high risk due to the expectation that it requires completion of uncertain condemnation and permitting processes in Indiana, and will likely be very contentious due to the displacement of the existing residential community and a unique air field (Lee Bottom Flying Field).
- Sterling Ventures. This alternative is considered high risk given that the long-term capacity of the mine to store CCR cannot be confirmed. Additionally, this would be the first full CCR operation for the mine owner, and the first CCR disposal in a mine below the water table. Regulatory risks related to CCR disposal beneath the water table are an unknown and in any event could change

over time. Investment in such an uncertain alternative would not be prudent for LG&E and at risk of denial by KPSC, even assuming a successful procurement process could be undertaken.

- Valley View. This alternative is considered high risk given that it would commit LG&E to 37 years of community impacts from high volume truck traffic on public roads. Given anticipated community opposition, obtaining a permit amendment to allow CCR disposal at the existing landfill is not a certainty. Even a temporary permit (e.g. if other options are delayed) is problematic. The success of a procurement process for this alternative is another unknown.

Because of these significant risks and uncertainties that cannot now be resolved, LG&E would consider that Lee Bottom, Sterling Ventures and Valley View alternatives are impracticable even without consideration of costs. However, for purposes of this Supplement, LG&E has not used logistical risk as the sole basis for determining whether the alternatives are practicable, but has considered that issue in tandem with costs and environmental impacts as discussed in the sections that follow.

D. COST ANALYSIS OF CASE STUDY ALTERNATIVES

The development of comparison cost estimates for the case study CCR disposal facility alternatives is described in Appendix III.D-1. The procedure includes: 1) using experience in landfill design to identify project elements for which costs are likely to be significant enough to influence the selection of an alternative; 2) determining a unit cost for each such element; 3) estimating the number of units for a given alternative to which the unit cost applies; and 4) multiplying units by unit costs to determine total cost. An example project element is acquisition of land, the cost for which would be determined by multiplying the number of acres required by a conceptual project design times the expected purchase price per acre. For simplicity, a single unit value is chosen for land price, even though in some cases (such as Lee Bottom) the cost is likely to be greater than the equivalent cost at Ravine B.

Because the cost analysis is intended only to distinguish among disposal alternatives, not all costs of CCR management are included. For example, all alternatives would require treatment of combustion residuals within the TC Station site prior to transport off-site, whether that transport is by conveyor, barge or truck. This cost is several dollars per cubic yard, but is identical for each option and thus is not included in Appendix III.D-1 or in the comparative costs given below.

In prior analyses, a number of landfill costs (especially related to standardized elements of construction and operation) were similarly not considered because they were expected to be about the same for all disposal options. However, in this Supplement there are two options (Sterling Ventures and Valley View) that do not involve construction and operation of a conventional CCR landfill by LG&E, but instead involve reliance on other operators of disposal facilities who will charge a tipping fee. Therefore, in Appendix III.D-1 methods to estimate costs are presented for all significant components of a CCR landfill, and full costs are included for both Ravine B and Lee Bottom. One result of this approach is that the costs for Ravine B, in dollars per cubic yard, are noticeably higher than presented in the Alternatives Analysis submitted with the 404 application, though they still do not represent the full cost of CCR management when treatment and other common costs are considered. This increased cost for the Ravine B landfill –

as presented in Table III.D-1 – is considered appropriate for comparison to Sterling Ventures and Valley View.

EPA has expressed concern that the costs of mitigating impacts to wetlands and streams were substantial and had not been accounted for in LG&E's assessment of alternatives. Such costs were included in the prior analysis, and are also included in this Supplement.

Cost sheets have been developed that are specific to each case study alternative. Both capital and operating costs are considered, including costs for mitigation. The cost sheets are provided in Table III.D-1 (Ravine B), Table III.D-2 (Lee Bottom), Table III.D-3 (Sterling Ventures) and Table III.D-4 (Valley View). The resulting costs per cubic yard over the project lifetime are of course approximate but considered appropriate for a LEDPA analysis. These costs are as follows:

CASE STUDY ALTERNATIVE	COST PER CUBIC YARD
Ravine B	$11.72
Lee Bottom	$15.51
Sterling Ventures	$19.71
Valley View	$36.45

Costs per cubic yard would be slightly greater than tabulated above if there would be substantial beneficial reuse of CCR. The exception is Valley View, for which costs are insensitive to volume.

As a regulated utility, LG&E's ability to recover costs is subject to the jurisdiction of the Kentucky Public Service Commission (KPSC). Appendix III.D-2 is a summary of the policies of KPSC with respect to allowable costs, e.g. costs that can be recovered through rates. KSPC has consistently required utilities to adopt the least cost reasonable alternatives, with limited flexibility to allow higher costs only if those can be clearly explained and fully justified.

In the previous Alternatives Analysis, LG&E used a rule of thumb that an alternative that is 20% or more expensive than the lowest cost option would be judged as having "unreasonable" or "excessive" costs. Under this metric, even the lowest cost case study alternative to Ravine B, Lee Bottom, would be judged as having an excessive cost because it is more than 30% more expensive. In practice, there is no KPSC rule of thumb for what may be considered an unreasonable additional expense, and LG&E's experience is that even a 20% cost differential is greater than the KPSC can be expected to approve, particularly where a 20% difference would equate to about $80 million over the project life in present day costs.

E. ENVIRONMENTAL ANALYSIS OF CASE STUDIES

Appendix III.E-1 identifies the types of environmental and other impacts that would typically have the potential to be the most significant. The dominant impacts are those resulting from the placement of facilities on the ground, or from CCR transport, and that cause loss or disruption of the physical, hydrologic, biologic and human resources at a disposal site or along the transportation route.

Appendix III.E-1 also briefly describes the methods used to quantify or otherwise assess impacts from the alternatives. In a manner similar to the procedures for estimating costs, a typical method involves some measure of the magnitude of the impact-causing activity, adjusted by the measure for the level of impact associated with such activity. For some impact categories, the assessments are more qualitative.

LG&E does not find that any of the alternatives would be unacceptable based on physical, hydrologic or biologic impacts. However, impacts to the human environment are arguably unacceptable for the Lee Bottom alternative, as an existing rural community would cease to exist if that site is converted to a landfill. In addition, impacts to the human environment could and likely would render the Valley View alternative unacceptable (impossible to implement) if the Valley View landfill were to be the permanent disposal location for TC Station CCR, due to the intense and disruptive truck traffic through small rural communities that would result. The fact that such traffic might need to occur for even a few months or years, if the Ravine B project is substantially delayed, is a strong motivator to complete the proposed Ravine B landfill on schedule.

F. DETERMINATION OF LEAST ENVIRONMENTALLY DAMAGING PRACTICABLE ALTERNATIVE

Figure III.F-1 displays air photos of the four case study alternatives and includes annotations as to the cost and primary issue of each. Ravine B is the least cost of the four case study alternatives. This alternative has already been approved by the KPSC. LG&E finds the extra costs for Lee Bottom, Sterling Ventures or Valley View are excessive, unreasonable, and unacceptable and believes the costs for those alternatives would not be accepted by the KPSC under KRS Chapter 278.

The discussion of risks in Section III.C highlights severe problems with the Lee Bottom, Sterling Ventures and Valley View alternatives.

- Cost aside, LG&E does not believe it would be practicable to proceed with the Lee Bottom alternative, given the disruption to the existing community that would occur, and the uncertainties about cultural resources, land condemnation and permitting in Indiana.
- Cost aside, LG&E does not believe it would be practicable to proceed with the Sterling Ventures alternative, given that long-term capacity cannot be assured, and there are concerns about existing and future regulatory limits on CCR placement below the water table. LG&E would be left without an ability to manage CCR if the Sterling Ventures site were to become unusable for any reason; or in the alternative LG&E would have to have a conventional duplicate site ready to implement.
- Cost aside, LG&E does not believe it would be practicable to proceed with the Valley View alternative, given the impacts of high-frequency constant truck traffic on local roads, and the uncertainties about permitting issues at the site. LG&E would reluctantly attempt to implement this alternative on a temporary basis if the plans for Ravine B are delayed.

These risks do not exist for the Ravine B alternative. For that alternative, LG&E considers risks as follows.

- EPA's contention that the ravine contains aquatic resources of national importance has been addressed in this Supplement. The watershed does not contain such resources.
- EPA's concerns about LG&E's evaluation of other alternatives have been addressed in this Supplement. LG&E considers that the current footprint for the Ravine B landfill addresses permitting concerns raised by the Kentucky Division of Waste Management.
- LG&E has acquired all property necessary to implement the alternative through purchase from willing sellers and considers there are no logistical obstacles to timely implementation of the project.

Based on cost and risk, LG&E concludes that of the four case studies, a CCR landfill in Ravine B is without question the Least Environmentally Damaging Practicable Alternative. A comparison of Ravine B to additional alternatives is provided in Section IV.

IV. ASSESSMENT OF OTHER ALTERNATIVES

A. INTRODUCTION

As summarized in Section III.A, EPA has asked LG&E to provide an analysis that more clearly and completely describes the process by which the Least Environmentally Damaging Practicable Alternative (LEDPA) was identified.

Table IV.A-1 lists 47 alternatives that LG&E evaluated in the process of determining which alternative is the LEDPA. All but one of these was analyzed in GAI (2014), which is provided here as Support Document I-1. The one addition is the Sterling Ventures Mine, identified by EPA its letter of August 7, 2014 as a potentially feasible alternative warranting careful consideration.

Section III of this supplement was prepared to document the thoroughness of LG&E's evaluation of alternatives. Through case studies (including Sterling Ventures), Section III documents the methods used by LG&E in assessing alternatives and selecting the LEDPA. Similar methods were applied by GAI (2014) in its prior assessment of other alternatives. Of those alternatives previously assessed, a number do not require additional discussion.

- Some alternatives are similar to the case studies evaluated in Section III, and are effectively assessed there.
- Others involve Ravines A or B and are presumed not to address what LG&E understands to be EPA's concerns about impacts to aquatic resources in those watersheds.
- There are some options that are not practicable for plainly evident reasons (e.g. the No Action alternative; the Ravine B option for which a Special Waste Permit was denied by the Kentucky Division of Waste Management in May 2013 based on potential impacts to the "Lime Cave" karst feature).

The alternatives for which an expanded discussion of the prior analyses is not required are identified in Table IV.A-2; in each case the table provides the reasons why no further evaluation is needed.

There are 25 alternatives identified in GAI (2014) that are not excluded in Table IV.A-2. These 25 alternatives are identified in Table IV.A-3, and their location is shown in Figure IV.A-1. Fewer than 25 locations are shown, because several of the locations are part of alternatives that involve multiple sites. LG&E is providing a site-by-site review of the alternatives in response to EPA's request for "a thorough and transparent analysis of alternatives and associated environmental impacts to ensure that the LEDPA can be selected".

Specifically, GAI has prepared a fact sheet for each alternative listed in Table IV.A-3. The 25 fact sheets are provided in Appendix IV.A-1. Figure IV.A-2 is the template for the fact sheets. The intent of the fact sheets is to provide EPA and the USACE with information on the alternatives in a standardized format. This should make it easy for any reader to find particular information on a given alternative, and to make comparisons among alternatives.

The information presented in the fact sheets as shown in Figure IV.A-2 is as follows.

- The initial entries on each fact sheet provide basic information on the alternative, including its location and primary characteristics. Each fact sheet also provides the principal basis upon which the alternative was determined to be not practicable in GAI (2014). An important purpose of Section IV is to provide information that is relevant to explaining the basis for the prior determination.
- A site map is provided for every alternative. The maps display the conceptual layout of the CCR management and disposal facilities that was used to evaluate project logistics and, where appropriate, costs.
- On each fact sheet, three tables are presented to summarize the results of the analysis of each alternative with respect to logistics, costs and environmental resources considerations. The level of analysis for a category of impacts may vary depending on the alternative. For example, some alternatives that were determined not to be practicable due to all or a substantial portion of a site being located in the Ohio River 100-year floodplain were not analyzed on the basis of cost because EPA has agreed that this logistical factor renders an alternative impracticable. It should also be noted that in order to address EPA's comments, environmental impacts are noted for alternatives that are otherwise impracticable even though such assessment is not required under the Section 404(b)(1) guidelines.
- The final entries on the fact sheet provide comments and conclusions as appropriate to expand upon information provided in the tables, and to summarize the basis by which an alternative was evaluated to determine whether it is practicable or has unacceptable adverse environmental impacts.
- Comments that apply to all sheets, and other guidance regarding the fact sheets, are provided in the introduction to the Appendix.

B. BASIS FOR EVALUATION OF SITES

Primary considerations with respect to evaluation of the alternatives identified in Table III.A-3 included the following.

- Site capacity.
- Location in the 100-year floodplain.
- Other locational concerns.
- Additional costs for land acquisition.
- Additional cost of multiple landfill concepts.
- Additional costs for transportation.
- Environmental impacts, including impacts to the human environment.
- Permitting considerations.

For each alternative, comments on the fact sheets identify which considerations are the principal reasons for considering an alternative as not practicable or as having unacceptable adverse environmental impacts.

Site capacity. As discussed in Appendix III.C-1, LG&E considers it to be highly uncertain how much beneficial reuse of CCR might reduce the volume of CCR that must be managed over the nominal lifetime of the Trimble County station. Nonetheless, consistent with its prior analysis, GAI was asked to assume a potential 30% beneficial reuse rate, so that a site with at least 23.4 million cubic yards of capacity is considered as potentially practicable. Sites with less capacity were not rejected outright but assessed further in combination with other small capacity sites.

In many cases, the conceptual design shown in the fact sheet could be revised to increase site capacity and potentially allow an otherwise small site to be considered potentially practicable on its own. In such cases, notes on a fact sheet are used to explain site constraints that limited the conceptual design. In general, a change in design to provide additional capacity would encroach on site features that would greatly increase costs and/or environmental impacts.

Location in 100-year Floodplain. The logistical analysis of each site included identification of conditions that can be considered as a "fatal flaw" to siting of a large CCR disposal facility. As discussed in Appendix III.C-1, beyond site capacity one potentially important siting consideration is whether all or a substantial portion of the landfill would have to be located in the Ohio River 100-year floodplain. EPA's letters indicate it has concurred with the conclusion that Ohio River floodplain sites are not practicable. LG&E anticipates that such a location – like the Dickey Farm site (Alternative A, and included in Alternatives M, O and W), the North River Terrace site (included in Alternatives D, O and T) or several of the South River Terrace sites (such as those included in Alternatives E, F, P and U) – would be extremely difficult, if not impossible, to permit given both safety and environmental concerns and regulatory prohibitions.

Other locational concerns. Location factors that are cited on some fact sheets include: use of a mine or quarry site, which may not be acceptable for CCR disposal (Alternative E); and location in Indiana, which raises permitting issues similar to those for Lee Bottom (e.g., Alternative J). These factors are considered sufficient to judge an alternative as not practicable.

Additional costs and uncertainties associated with land acquisition. Alternatives to Ravine B would require LG&E need to acquire significant acreage for siting of the landfill itself (including an appropriate buffer) and/or for ancillary facilities and borrow areas. Several hundred to more than a thousand acres may be required, adding $10 million or more to the cost of an alternative.

In addition, the property acquisition process is a highly uncertain one, both in terms of timing and the ability to find willing sellers. Negotiations can often be protracted and in some cases landowners may simply refuse to sell their property, rendering a site unavailable (and therefore impracticable) unless LG&E chooses to engage in the expensive and uncertain process of condemnation. This factor may be a particular concern for alternatives that would involve the displacement of existing residences, such as the Browning Branch Tributary Ravine alternative (Alternative H).

Additional cost of multiple landfill concepts. When the CCR storage volume requirement could not be met with an individual CCR disposal facility location, multiple individual facilities would need to be developed. A single CCR disposal facility that can handle the entire Project's volume requirements would typically require less property to be purchased than an alternative that requires multiple facilities, with consequent increased cost and potential delay. The size of a liner and underdrain system would be greater for a typical small landfill than a large one, when measured per cubic yard of volume serviced.

Other factors associated with having multiple independent CCR disposal facilities that could affect the project cost and schedule include design and construction of separate infrastructure, such as haul roads, pipe conveyors, stormwater and leachate ponds and treatment systems, and landfill subgrade and liner construction (if applicable). The incremental cost of alternatives involving three or more landfill sites is estimated to be at least $2 and as much as $5 per cubic yard. See additional discussion in Appendix IV.B-1.

Additional costs for transportation. Almost all alternatives are farther from TC Station than Ravine B and therefore would incur additional transportation costs over decades of project operations. Three sites (Bethlehem Terrace (Alternative J), Spring Creek Terrace (Alternative K) and Cooper Bottom (Alternative L)) would incur costs for construction of barge terminals and barge operations. Others would be reached by a land-based transportation corridor with a pipe conveyor and haul road, with added construction and operations and maintenance costs in proportion to the increase in distance.

Additional costs for double handling of clay borrow material. While double handling of borrow material was not quantified, it is an additional expense that results when borrow material cannot be directly moved from the source to the landfill, but must be temporarily stored (as occurs when the landfill is sited on ridge tops or other borrow areas that have high potential to possess clay material that can be used for liner and cover systems). These costs can be significant.

Environmental impacts. The alternatives also involve a variety of impacts to the environment, including impacts both to natural resources and the human environment. These impacts include the following.

- Streams/wetlands – All of the ravine sites would – like Ravine B – result in impacts to streams that would be considered waters of the U.S. by the USACE and EPA. For a site like Browning Branch Tributary Ravine (Alternative H), the impacts to streams would extend to many thousands of linear feet, some of which could be of higher value than the streams in Ravine B.
- Threatened and endangered species – All of the ravine sites (Browning Branch Tributary Ravine, Barebone Tributary Ravine, South River Terrace East, Corn Creek Valley, Ravine C) would involve clearing of forested area and therefore would potentially impact habitat for the Indiana bat.
- Karst – All of the ravine sites would potentially include karst features that could be impacted by any landfill project.
- Cultural resources – Like the Lee Bottom site, all of the sites in the Ohio River floodplain and on adjacent terraces (Dickey Farm, Bethlehem Terrace, Spring Creek terrace, Cooper Bottom, North

River Terrace, South River Terrace) would have significant potential for unrecorded archaeological sites.

- Prime farmland – The ridge top sites, including the Connor Ridge Road site, would impact areas currently or historically used for farming activities. Floodplain sites could also impact farmlands.
- Public safety – For those alternatives requiring barge transportation of CCR, such transportation would create potential safety risks for other commercial and private boat traffic on the river. Moreover, in the event the river was closed to barge traffic, CCRs would have to be hauled by truck over public roads to Valley View Landfill, creating public safety issues on the roads.
- Quality of life (including aesthetics, noise and other related impacts) – Again like the Lee Bottom site, any of the Ohio River floodplain sites or sites on adjacent terraces would present aesthetics issues because they would involve the conversion of currently undisturbed areas to industrialized areas presenting a very different visual aspect to those traveling up and down the river. Perhaps more importantly, the ridge top sites would inevitably involve the creation of prominent new landscape features that would be visible to local residents and those traveling in the area and that would have significant potential to result in strong community opposition. For example, the Browning Branch Tributary Ravine site (Alternative H) would involve displacement of a number of residences and the construction and operation of a landfill in close proximity to Highway 625 and a church. Likewise, the Connor Ridge Road Ridge Tops site (Alternative G and a component of Alternatives Q, X and Y) would involve displacement of residences and construction of a landfill that would eventually rise 200 feet above the surrounding landscape near Highway 625. The noise associated with both construction and operations at these ridge top sites would likewise impact nearby residential properties and would contribute to community concerns.

Permitting. Many of the alternatives would be expected to present multiple resource impact issues that would affect LG&E's ability to obtain necessary permits for construction and operation of landfills as well as the time it would take to obtain such permits. For example, most if not all of the alternatives would involve impacts to waters of the U.S. which would require LG&E to obtain Section 404 authorization; for ravine sites such as Browning Branch Tributary Ravine, the impacts to streams would be such that an individual Section 404 permit would undoubtedly be required.

Alternatives involving forested ravine sites such as Browning Branch Tributary Ravine, Barebone Tributary Ravine and Ravine C would also involve impacts to potential Indiana bat habitat, necessitating Section 7 consultation with the Fish and Wildlife Service. All sites on or against uplands may include karst features that must be addressed. Sites located on terraces along the Ohio River or in the Ohio River floodplain have a moderate to high potential for cultural resources that would trigger requirements under Section 106. All of these issues would substantially affect the time and project costs associated with the overall permitting process.

C. IS THERE AN ALTERNATIVE THAT SHOULD BE THE LEDPA?

LG&E considers that all alternative sites with insufficient standalone capacity and/or location in the Ohio River floodplain, in Indiana, or in a mine/quarry are not practicable and can be rejected as being a potential Least Environmentally Damaging Practicable Alternative.

All other alternatives addressed in Appendix IV-A-1 would have costs substantially greater than those of Ravine B, if only because of greater distance from TC Station and consequent expense for construction and operation of transportation facilities. As discussed in Section III and as set forth in Appendix III.D-2, as a regulated utility LG&E's ability to recover costs is subject to the jurisdiction of the KPSC. The Commission has consistently required utilities to adopt the least cost reasonable alternative, with limited flexibility to allow higher costs only if those can be clearly explained and fully justified. Given these constraints, the added costs that would be required to implement any of the other alternatives would be highly problematic with respect to approval by the KPSC.

Cost and logistics aside, few of the alternatives to Ravine B assure a lesser impact to aquatic species, and most would have considerably more impact on people who live in and near the potentially impacted area. Given the determination set out in Section II that the aquatic resources of Ravine B fall far short of what could be considered to be of national importance, LG&E considers that it would not be good corporate practice to abandon the Ravine B project, in favor of creating significant and unnecessary impacts on its neighbors.

Given costs, risks and logistical constraints, no alternative to Ravine B can be considered practicable. Many of the alternatives would involve significant adverse impacts to the natural or human environment. None would be considered as in the best interests of ratepayers. LG&E stands by its prior determination that the Ravine B project is both its preferred alternative and the Least Environmentally Damaging Practicable Alternative.

V. SUMMARY

A. THE ISSUES

In its letters of July 11, 2014 and August 7, 2014, EPA asserts that the LG&E proposal for a CCR landfill in Ravine B will have significant impacts to exceptional aquatic resources and that LG&E has failed to provide a sufficiently complete and transparent analysis demonstrating that there is no practicable alternative to the Ravine B project. LG&E has prepared this Supplement in response to the EPA letters.

B. EPA HAS INCORRECTLY ASSESSED THE AQUATIC RESOURCES IN RAVINE B

LG&E considers that EPA is incorrect in its finding that the Ravine B project "may result in substantial and unacceptable adverse impacts on aquatic resources of national importance" (letter of July 11, 2014, copied here in Appendix I. A-1). Section II of this Supplement establishes the following.

1. EPA was misinformed by KDOW representatives as to the habitat rating for the main stem of the unnamed tributary in Ravine B. KDOW's most recent sampling actually rates the habitat as "good", not "excellent" as EPA was initially told.
2. The data demonstrate only that pollution-intolerant macrobenthic fauna occur seasonally in Ravine B. The species observed are common and not "sensitive" except as to pollution. The aquatic resource value of a watershed cannot be based on these data alone.
3. EPA overstates the quality of aquatic habitat in Ravine B compared to other watersheds in the region. Biota and water quality in Ravine B are equivalent to and in some respects poorer than in other small drainages, presumably because Ravine B is impacted by past timbering and current upland agriculture. Conditions in Ravine B appear to have improved under LG&E ownership, and the presence of pollution intolerant species means the stream is not impaired. A condition of "not impaired" does not qualify the aquatic resources in Ravine B to be considered unique or outstanding.
4. EPA makes generic statements about the importance of headwater streams to downstream aquatic resources. The streams in Ravine B have very few if any of the characteristics that could make such statements relevant. The tributary system in Ravine B does not have a natural outlet. The limited aquatic resources that occur downstream are found in relatively short segments of constructed or channelized streams adjacent to the TC Station ash impoundments. Based on their size and condition, the aquatic resources in Ravine B can provide no significant benefit to the aquatic ecology of the Ohio River.
5. EPA's evaluation has not considered the hydrologic realities of Ravine B. Specifically, the bulk of the stream channels in Ravine B that require mitigation have ephemeral flow and essentially no aquatic life. The remainder of the stream channels in Ravine B that require mitigation have intermittent flow and are dry for several months each year. The fauna observed does not include

species (such as fish, or macrobenthics with a life cycle greater than 1 year) that require perennial water. The biological diversity and integrity of the watershed is good only in the context of comparison to other relatively dry systems that may have more impact from development.

6. An integrated or holistic assessment of the aquatic biota in Ravine B would rate the aquatic system of Ravine B "poor". For example, fish are absent and a robust trophic structure does not otherwise occur in this watershed.
7. While LG&E will be required to pay a mitigation fee for more than 16 miles of impacted jurisdictional streams, the actual stream length with any potential aquatic value to be impacted is approximately 2 miles, and the biota primarily affected are common insect larvae having a short enough life cycle to survive seasonally dry conditions.
8. The fact that a pool and riffle structure exists in the main stem of the unnamed tributary in Ravine B does not qualify the stream for consideration as a Special Aquatic Site. Both pools and riffles are so often dry as to support only a limited aquatic fauna. Dissolved oxygen in those pools during low flow periods has been measured as being below Kentucky's water quality standard for support of aquatic life.
9. Ravine B does not serve as habitat for any protected aquatic species.
10. LG&E has made many changes to its landfill project to mitigate the impacts to the limited aquatic resources that occur. In particular, the total acreage and stream length to be affected has been greatly reduced. In contrast to earlier plans, there will be no CCR disposal in Ravine A. The impacts that remain will be mitigated in accordance with State and Federal requirements.

Based on these considerations, EPA has not adequately assessed the quality and significance of aquatic resources in Ravine B, and has overstated the impacts that will occur. There are no aspects of the Ravine B aquatic resources that could reasonably qualify as worthy of national recognition.

C. EPA'S CRITICISMS OF LG&E'S ALTERNATIVES ANALYSIS HAVE BEEN ADDRESSED

In Sections III and IV of this Supplement, LG&E has expanded the documentation of its prior Alternatives Analysis and provided detailed evaluations of the Ravine B proposal in comparison to three case study alternatives. Two of the case studies examined in detail in Section III are alternatives that were suggested by EPA (Lee Bottom and Sterling Ventures); the other can be initiated with no direct aquatic impacts (Valley View landfill) and represents the long-term default option if no other alternative can be implemented.

Section IV provides additional information regarding the evaluation of other alternatives previously assessed in GAI (2014), utilizing as appropriate the concepts and methods documented for the case studies. LG&E intends for this documentation to provide EPA with information it has requested.

The result of the expanded discussion does not result in any change in outcome. A landfill in Ravine B is confirmed as the Least Environmentally Damaging Practicable Alternative (LEDPA) for CCR disposal from the Trimble County Generating Station. This Supplement establishes the following.

1. LG&E's 30 years of planning and engineering for the Ravine B landfill have not identified any fatal flaw to use of the location for CCR disposal. On the contrary, the site continues to have practical and economic value due to its proximity to the TC Station, which minimizes the cost and impact of transportation.
2. Many alternatives to Ravine B are not practicable due to their location within the 100-year floodplain of the Ohio River.
3. Many alternatives to Ravine B have limited capacity and would potentially meet LG&E's overall project purpose only in combination with other small sites, at an increased cost.
4. Of the sites outside the Ohio River floodplain and with adequate capacity (alone or in combination), none are competitive in cost to Ravine B. This is generally the result of greater transportation costs which typically offset any potential savings in landfill costs. The two options that may not impose a significant near-term cost for landfill construction (Sterling Ventures and Valley View) both are not cost-competitive due to transportation costs and the imposition of a costly landfill tipping fee.
5. It is LG&E's opinion and experience that the substantially higher costs of alternatives to Ravine B would be considered unreasonable by the Kentucky Public Service Commission, and, in many cases, insufficiently demonstrated as reliable for 37 years of CCR disposal.
6. The three case studies illustrate the potential impacts and risks of implementing alternatives other than Ravine B. CCR disposal at Lee Bottom or Valley View would have major environmental impacts to people and their livelihood (loss of the Lee Bottom rural farm community and air field; high-volume truck traffic to Valley View). The Lee Bottom site presents unknown land acquisition risks, particularly since the site is not in Kentucky. At Sterling Ventures the risks arise because long-term capacity cannot be assured and disposal beneath the water-table may not be permitted without substantial additional expense. It is not certain that any of these alternatives could receive all necessary permits to be implemented. Similar issues – particularly with respect to land acquisition and potential community disruption and opposition – are presented by several of the ridge top alternatives.
7. Alternatives involving other ravines – such as the Browning Branch Tributary Ravine – would also involve impacts to streams and wetlands.

D. CONCLUSION

Based on the facts demonstrated in this Supplement, LG&E confirms that the Ravine B landfill is the Least Environmentally Damaging Practicable Alternative for management of CCR materials from the Trimble

County Generating Station. It is also the most prudent choice for a regulated utility such as LG&E. LG&E can identify no reasonable basis for EPA's recommendation for "denial of this project as currently proposed" (letter of July 11, 2014, copied here in Appendix I. E-1).

ACRONYMS

This list is limited to acronyms used in the main text of the Supplement.

ACRONYM	STANDS FOR
AMU	Adjusted Mitigation Units
ARNI	Aquatic Resource of National Importance
BO	Biological Opinion
CCR	Coal Combustion Residuals
CEC	Civil and Environmental Consultants, Inc.
CWA	Clean Water Act
EPA	The United States Environmental Protection Agency
EPT	Ephemeroptera (mayfly), Plecoptera (stonefly), and Trichoptera (caddisfly) taxa
FILO	Fee in lieu of
GAI	GAI Consultants, Inc.
IBCF	Indiana Bat Conservation Fund
KDFWR	Kentucky Department of Fish and Wildlife Resources
KDOW	The Kentucky Department of Water
KMBI	Kentucky Macrobenthic Index
KPSC	The Kentucky Public Service Commission
LEDPA	Least Environmentally damaging practicable alternative
LG&E	Louisville Gas and Electric
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
TC	Trimble County
USACE	The United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Forest and Wildlife Service

Table II.A-1, page 2.

"In conclusion, the EPA... finds this project may result in substantial and unacceptable adverse impacts on aquatic resources of national importance. Therefore, we recommend denial of this project as currently proposed".

Letter of August 7, 2014

References and attaches the July 11 letter, with the following additional comments.

"The proposed LG&E project would have direct impacts ... on a watershed drained by an unnamed tributary to Corn Creek that has been documented as having high water quality and a diverse biological community, as evidenced by an "excellent" Macroinvertebrate Bioassessment Index (MBI) rating"

"An additional indication of the quality of this stream system can be found by comparing the system that is proposed to be impacted to a nearby stream. Sampling conducted by LG&E's consultants in 2007, documented that conditions in the streams proposed to be impacted by construction and operation of the CCR landfill were in fact better (i.e. higher scoring on the MBI) than conditions documented in a stream lying immediately to the north. That northern stream is designated by the Commonwealth of Kentucky as an Exceptional Water of the Commonwealth, an Outstanding State Resource Water and is also included in the Commonwealth's biological reference reach network"

"The Kentucky Division of Water resampled the streams proposed to be impacted in March 2013 and again found that the stream's biological community ranked as "excellent" according to the MBI".

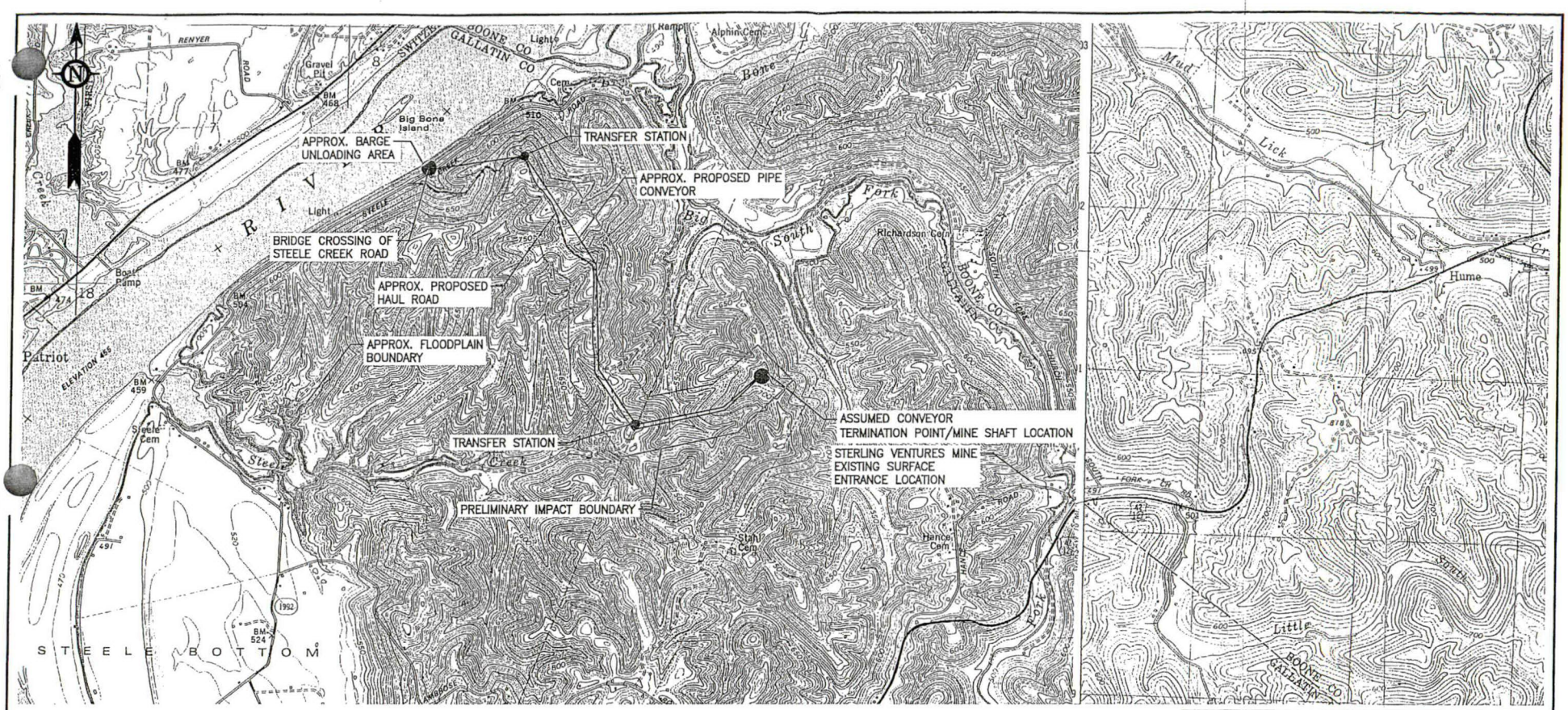
"It is the applicant's responsibility to consider all practicable alternatives and to select a practicable alternative that does not involve a special aquatic site unless it can be clearly demonstrated that one is not available".

"The EPA continues to be concerned that the proposed discharge of dredged or fill material into waters of the U.S. would eliminate 16.5 miles of streams that have been documented to be among the highest quality in this region of Kentucky".

"Given the potential elimination of high quality streams as described above, and consistent with Part IV, paragraph 3(b) of the 1992 CWA Section 404(q) MOA between the EPA and the Department of the Army, the EPA believes that the discharge, as proposed, will have a substantial and unacceptable impact on aquatic resources of national importance"

Table III.C-1. Logistical considerations for the case study alternatives

Issue	Ravine B	Lee Bottom	Sterling Venture	Valley View
Capacity	Site allows for a landfill with full storage capacity.	Site allows for a landfill with full storage capacity.	Current capacity sufficient for 5.5 years. No assurance site has sufficient capacity for 37 years.	This active landfill appears to have potential for expansion if needed.
100-year floodplain	Some minor facilities would be in the floodplain, but not the CCR landfill.	Barge facilities and some transportation facilities would be in 100-year floodplain, but the CCR landfill would not.	Barge facilities and some transportation facilities would be in 100-year floodplain.	Facilities are outside of 100-year floodplain.
Cemeteries	The conceptual design avoids the one relatively large cemetery.	The conceptual design avoids the identified cemetery.	None identified that require avoidance.	Not an issue at this site.
Wetlands and streams	Will require permitting and mitigation for impacts to jurisdictional streams and wetlands.	Will require permitting and mitigation for impacts to jurisdictional streams and wetlands.	Will require permitting and mitigation for impacts to jurisdictional streams and wetlands.	May require minor permitting and mitigation if and when landfill must be expanded.
Karst	The conceptual design avoids all but a few small solution features.	Karst may occur on escarpment.	Karst may occur along transportation route.	Not expected to a major issue.
Utility lines	A 345kV line must be relocated.	Minor relocations only.	Minor relocations only.	Relocations not needed.
Prime farmland	No effect on design or permitting expected.	Large acreage of farmland will be impacted, potentially creating permitting issues.	No effect on design or permitting expected.	No effect on design or permitting expected.
Cultural resources	Permitting issues addressed in current design.	Expectation is that there will be extensive requirements to survey cultural resources and provide mitigation.	May be a minor consideration along transportation route.	No effect on design or permitting expected.
Threatened and endangered species	Will require FWS consultation and impact mitigation.	Will require FWS consultation and impact mitigation.	Will require FWS consultation and impact mitigation.	No issues identified.
Mining/quarry	Not an issue at this site.	Not an issue at this site.	Potentially not feasible if liner and leachate management required.	Not an issue at this site.
Transportation	Short corridor on LG&E land for new pipe conveyor and haul road.	Barge facilities and haul road must be constructed.	Barge facilities and transportation corridor must be constructed.	Heavy truck traffic on public roads.
Aesthetics	Some aesthetic impact beyond buffer properties.	Existing rural setting converted to industrial site.	Some impacts along transportation route.	Impacts are those of a major solid waste landfill.
Land acquisition	All land required for facilities is owned by LG&E.	Large acreage needed, including residences and flying field. Condemnation may be required but authority in Indiana unclear.	A part of one large property must be accessed.	Not known to be an issue at this site.
Permitting	Permitting process is far along.	Unknown issues associated with permitting a CCR facility in Indiana. Permits needed for barge facilities.	Must modify existing CCR permit; uncertain issues from CCR disposal below water table; permits needed for barge facilities.	Probably need to modify existing permit to allow CCR storage; may require liner and leachate control; permit for future expansion.
Other considerations	Relatively rocky and steep terrain at landfill site.	Community impact makes this option controversial and problematic.	Numerous uncertainties make this option problematic and potentially not capable of LG&E participation.	Truck traffic will make this option controversial and problematic.



REFERENCE:
TOPOGRAPHIC MAPPING FROM USGS 7.5 MINUTE QUADRANGLES, BEDFORD (1984), BETHLEHAM (1987), MADISON EAST (1994), & MADISON WEST (1980), KENTUCKY.

NOTE: IMPACT BOUNDARY INCLUDES AREA TO CONSTRUCT AND OPERATE PIPE CONVEYOR AND HAUL ROAD.

SCALE: 1" = 2000'

2000 0 2000 4000

EARTHWORK QUANTITIES AND CCR VOLUMES			
SUBGRADE EARTHWORK		CCR VOLUME	
CUT (MCY)	0	GROSS (MCY)	34.58
FILL (MCY)	0	LINER/CAP (MCY)	0.00
NET (MCY)	0	NET (MCY)	34.58

DRAWING TITLE: FIGURE III.B-3 – CONCEPTUAL DESIGN OF THE STERLING VENTURES ALTERNATIVE

TRIMBLE COUNTY
GENERATING STATION LANDFILL
SUPPLEMENT TO ALTERNATIVES ANALYSIS

LOUISVILLE GAS & ELECTRIC COMPANY (LG&E)
TRIMBLE COUNTY GENERATING STATION
TRIMBLE COUNTY, KENTUCKY

LG&E®

gai consultants

PITTSBURGH OFFICE • 385 EAST WATERFRONT DRIVE, HOMESTEAD, PA 15120-5005

DRAWN BY:	RJH	APPROVED BY:	KCC
CHECKED BY:	KPR	DATE:	11/26/2014
DRAWING NUMBER: FIGURE III.B-3			

This drawing was produced with computer aided drafting technology and is supported by electronic drawing files. Do not revise this drawing via manual drafting methods.

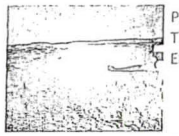
SCALE: 1"=2000' SHT. NO. ___ OF ___ REVISION

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Exhibit 6C

Sterling Materials – Verona, KY
Underground Cross Section

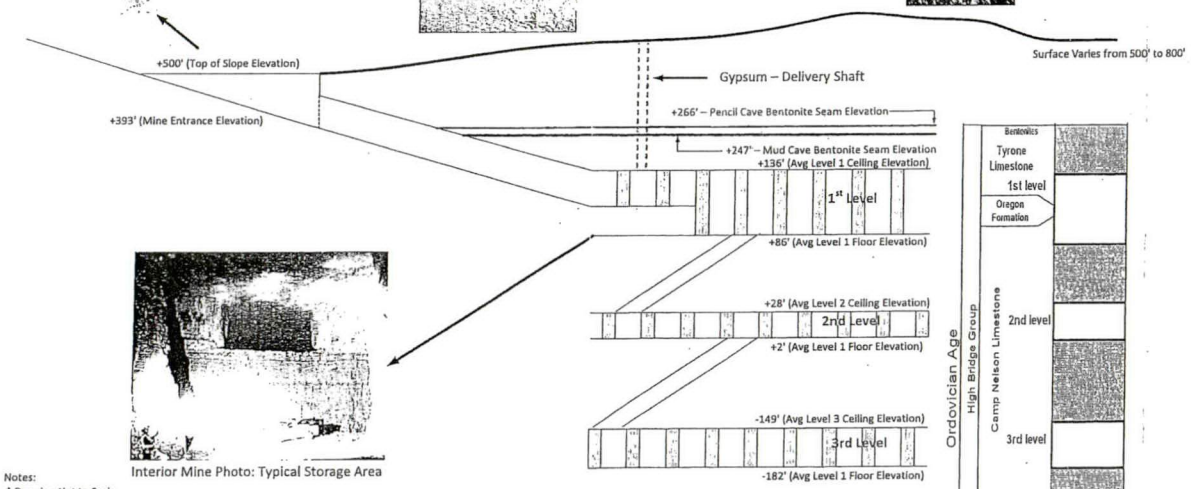




Pencil Cave Bentonite Seam
Thickness: ≈ 18"
Elevation: +266'



Mud Cave Bentonite Seam
Thickness: ≈ 24"
Elevation: +247'



Interior Mine Photo: Typical Storage Area

Notes:
- Drawing Not to Scale.
- Mine ceiling and floor elevations are based on average elevations across each level.
- Bentonite Seam and Rock Stratigraphy Information Resource: Kentucky Geological Survey, University of Kentucky, Lexington Series X, 1974. High Carbonate Rock in the High Bridge Group (Middle Ordovician), Boone County, Kentucky. Author: Garland R. Dever, Jr.
- Elevations are referenced at Sea Level.

REFERENCE:
INFOGRAPHIC FROM STERLING VENTURES, LLC PERMIT APPLICATION TO KY–DWM FOR REGISTERED PERMIT–BY–RULE BENEFICIAL REUSE OF SPECIAL WASTE, DATED JULY 15, 2010.

DRAWING TITLE: FIGURE III.B–4 CROSS SECTION OF UNDERGROUND MINE			DRAWN BY: RJH	APPROVED BY: KCC
TRIMBLE COUNTY GENERATING STATION LANDFILL SUPPLEMENT TO ALTERNATIVES ANALYSIS	LOUISVILLE GAS & ELECTRIC COMPANY (LG&E) TRIMBLE COUNTY GENERATING STATION TRIMBLE COUNTY, KENTUCKY	LG&E®	CHECKED BY: KPR	DATE: 11/26/2014
			DRAWING NUMBER: FIGURE III.B–4	
		gai consultants	This drawing was produced with computer aided drafting technology and is supported by electronic drawing files. Do not revise this drawing via manual drafting methods.	REVISION
			SCALE: N.T.S.	SHT. NO. ___ OF ___
PITTSBURGH OFFICE • 385 EAST WATERFRONT DRIVE, HOMESTEAD, PA 15120–5005			GAI DRAWING FILE NO.	C100784–07–007–11–C–FIG–III–B–4

GAI CAD FILE PATH: P:\PIT\2010\C100784.07 – Plan IIb Final Design CCR\CAD\007 (Other Studies)\CAD Department\Production Drawings\Drawings\...

FIGURE IV.A-2 TEMPLATE FOR ALTERNATIVES ANALYSIS FACT SHEETS

PROJECT DESCRIPTION		
SITE ID: FORMER ID:	NAME:	LATITUDE: LONGITUDE:
CONCEPT:	ANCILLARY FACILITIES:	
PRIMARY TRANSPORT:	ALTERNATIVES ANALYSIS (AA) OUTCOME:	

SITE MAP:

LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:

COST CONSIDERATIONS	

ENVIRONMENTAL RESOURCES CONSIDERATIONS

COMMENTS AND CONCLUSIONS:

NOTES:

TABLE I.B-1

TRIMBLE COUNTY GENERATING STATION CCR LANDFILL PLANNING AND DEVELOPMENT CHRONOLOGY OF EVENTS

Dates	Events
1979 - 1983	LG&E began initial studies of Ravine A and Ravine B for use of disposal sites for coal combustion residuals generated at the planned Trimble County Generating Station, which was under development at the time.
1981 - 1985	LG&E acquires property in Ravines A and B to accommodate plans for development of CCR landfill.
June 1984	LG&E submits a solid waste disposal landfill application to Kentucky Division of Waste Management (KDWM) for Ravines A and B.
July 17, 1984	KDWM issues Landfill Construction Permit (No. 112.03) for construction of the CCR landfill in Ravines A and B.
March 23, 1990	Landfill Construction Permit renewed by KDWM.
December 1990	LG&E completes construction of initial bottom ash pond for wet storage of CCR.
December 1990	LG&E commences operation of Trimble County Generating Station Unit 1 with a nominal rating of 566 MW.
May 2, 1996	Reissuance of Construction Permit for special waste landfill issued by KDWM. Permit expiration date listed as "life of facility."
December 17, 2004	LG&E Obtains a Certificate of Public Convenience and Necessity for Trimble County Generating Station Unit 2.
May 2006	LG&E initiates construction for the addition of Trimble County Generating Station Unit 2, a 750 MW net nominal generating unit utilizing supercritical pulverized coal technology.
2004 - 2006	LG&E conducts additional geotechnical and engineering evaluations for CCR disposal in Ravines A and B.
February to June 2007	MACTEC conducts additional archeological and biological studies in Ravines A and B for CCR landfill.
June 15, 2007	MACTEC submits Ravines A and B aquatic habitat water quality study for unnamed tributaries in Ravines A and B.
March 2008	MACTEC submits baseline aquatic quality report for proposed mitigation sites in Corn and Barebone Creeks to support CWA Section 401 Water Quality Certification.
2008 - 2009	MACTEC continues with studies relating to siting of the CCR landfill in Ravine B.
December 20, 2010	LG&E submits CWA Section 401 Application to Kentucky Division of Water for CCR landfill in Ravine B.
December 21, 2010	LG&E submits CWA Section 404 Application to U.S. Army Corps for CCR landfill in Ravine B.

Table I.B-1 (Continued)

Dates	Events
May 5, 2011	LG&E submits Landfill Permit Application to KDWM for CCR landfill in head of Ravine B.
December 8, 2011	Interagency meeting among LG&E, U.S. EPA and U.S. Army Corps to discuss the agencies' comments regarding the Alternative Analysis for the landfill proposed for Ravine B.
March 2012	LG&E submits revised CWA Section 404 Permit Application to the U.S. Army Corps for the project in Ravine B to address comments received from the agencies.
April 25, 2012	Correspondence from U.S. EPA Region IV to U.S. Army Corps with preliminary review comments on LG&E's March 2012 CWA Section 404 Permit Application.
May 22, 2012	Correspondence from LG&E to U.S. EPA Region IV responding to U.S. EPA comments on beneficial reuse issues related to the CWA Section 404 Permit Application.
May 22, 2012	Correspondence from U.S. EPA Region IV to U.S. Army Corps with final review comments on LG&E's CWA Section 404 Permit Application for Ravine B.
December 2012	LG&E commences operation of bottom ash pond dike extension and GSP liner project.
March 20, 2013	Notice of Intent to deny application letter sent to LG&E by KDWM for the Ravine B project based upon the landfill impact on the karst feature known as "Wentworth" or "Lime" Cave within the footprint of the landfill.
May 2, 2013	Notice of Denial letter received from KDWM for the Ravine B project based upon the impacts to "Wentworth" or "Lime" Cave.
April 25, 2014	Revised CWA Section 404 Permit Application and Alternatives Analysis submitted to the U.S. Army Corps for redesigned CCR landfill in Ravine B.
July 11, 2014	Correspondence from U.S. EPA Region IV to U.S. Army Corps with preliminary review comments on LG&E's January 2014 CWA Section 404 Permit Application.
August 7, 2014	Correspondence from U.S. EPA Region IV to U.S. Army Corps with final review comments on LG&E's January 2014 CWA Section 404 Permit Application.
August 29, 2014	KDOW releases corrected KMBI index scoring for Ravine B to LG&E.

Table II.A-1. EPA comments in letters of July 11, 2014 and August 7, 2014, related to aquatic resources in Ravine B. These comments focus on EPA's opinions and conclusions.

Letter of July 11, 2014.

"The proposed project, which includes a 189-acre landfill and an additional 6SI acres of support facilities and operations areas, will directly impact approximately 87.254 linear feet of stream, 2.6 acres of wetland and 0.5 acres of ponds. These stream impacts are a 60 percent increase over the linear length of stream impacts associated with this project as it was formerly proposed in 2011-2012".

"Based on our review of the available monitoring data from the project area, the EPA believes that the aquatic resources proposed to be impacted as a result of this project maybe among the highest quality headwater stream resources in this region of the Commonwealth".

"Considering that anticipated aquatic resources impacts in Ravine B are significant and the resources of high quality (further addressed below), mitigation costs for such impacts to waters of the United States will likely be significant. The EPA believes it is necessary to include compensatory mitigation costs throughout the alternatives analysis where project cost is a criterion for evaluation of practicable alternatives". "EPA estimates ... the project as presently proposed could require an [In Lieu Fee] payment of approximately $18 million".

"The present CWA 404 permit application fails to acknowledge the March 2013 field sampling effort in Ravine B where the proposed landfill would be located. That sampling was conducted by biologists from the Kentucky Division of Water (KDOW) and consultants for the LG&E. Based on KDOW's analysis, the Ravine B stream biological community was dominated by sensitive taxa, included numerous rare or uncommon taxa and scored "Excellent" on the Kentucky Macroinvertebrate Bioassessment Index(KMBI). This assessment was consistent with the conclusion reached by the LG&E's former consultant who sampled the stream six years earlier (Mactec, 2007). However, neither the KDOW nor the EPA has any record that the LG&E's consultants ever provided a data summary or interpretive report based on their collection of biological samples concurrent with the KDOW's own sampling effort in March2013. Instead, the present permit application evaluates stream quality based solely on physical stream habitat subjectively evaluated over the course of a two-year period from June 2011 throughNovember2013 ".

"While the present permit application includes the Mactec (2007) report as Attachment K in Volume III of the permit application, the text of the alternatives analysis downplays the significance of the Mactec conclusions by referring to a subsequent 2012 water quality assessment compiled by Civil & Environmental Consultants. Inc. (CEC). The latter report however, provides little relevant biological information on the Ravine B stream(s), because biological sampling was conducted outside of the KDOW's required sample index period"

"In spite of the relative paucity of biological data provided in the present permit application, the LG&E considers slightly over one-half of the total 16.5 miles of streams proposed to be impacted as "excellent"condition. Approximately 88 percent of intermittent streams in the Ravine B watershed are reported as "excellent" and 12 percent is considered in "average" condition. Furthermore, 82 percent of ephemeral channels in the Ravine B watershed are reported to be in "average" or "poor" condition, with the remainder rated as "excellent".

"In light of the quantitative evidence provided by Mactec in 2007, and the KDOW in 2013, the EPA believes that the quality of the unnamed mainstem tributary stream in Ravine B is equivalent to reference stream conditions, as defined in the Commonwealth's categorization criteria for "Exceptional Waters" in its antidegradation regulations at 401 KAR10;030 Section 1(2)(a):" [regulations quoted]. "According to the KDOW, there are only 13"reference" quality stream segments recognized in the Outer Bluegrass ecoregion of Kentucky [Ecoregion 71d) where the proposed project lies (C. BrantJey, *pers. comm.* July 7, 2014). Of those 13,only seven are headwater streams, like Ravine B, that drain a watershed of five square miles or less. The rarity of high quality reference streams in this ecoregion heightens the importance of pursuing all possible measures to avoid impacting such streams and requires regulatory diligence to ensure that such efforts are objective, quantifiable and thorough.

Table III.D-1
Cost Comparison Summary of Ravine B Alternative [1,2,3]

		Unit Costs	Unit	Ravine B Quantity	Ravine B Cost
CAPITAL COSTS					
	General Project / Permitting / Infrastructure Cost Impacts				
1	Property Acquisition	$ 12,000	Acre	0	$ -
2	Clearing, Grubbing, and Site Preparation	$ 17,000	Acre	521	$ 8,857,000
3	Large Utility Line Relocation (345 kV Single Circuit)	$ 880	LF	8,400	$ 7,392,000
4	Fencing	$ 50	LF	65,045	$ 3,252,250
5	Environmental Wetland Mitigation (cost based on adjusted mitigation units)	$ 72,000	Acre	2.58	$ 185,760
6	Environmental Stream Mitigation (cost based on adjusted mitigation units)	Varies	LF	87,253	$ 18,466,825
7	Cultural Resources	Varies	EA	1	$ 2,000,000
8	Indiana Bat Mitigation[4]	$ 5,338	Acre	521	$ 2,781,098
9	Road Relocation (County Road)	$ 350	LF	0	$ -
10	Road Relocation (State Road)	$ 400	LF	0	$ -
				Subtotal	**$ 42,934,933**
	CCR Transportation				
11	Pipe Conveyor Transport (North Ridge Top)	$ 2,150	LF	0	$ -
12	Pipe Conveyor Transport (Ogden Ridge Road Path)	$ 2,425	LF	5,236	$ 12,697,300
13	Pipe Conveyor Transport (South Ridge Top)	-			
	Additional O&M Costs				
47	Additional O&M Costs[5]				
	CCR Placement, Compaction, Survey, and QA/QC	$ 95,080,000	LUMP	1	$ 95,080,000
	Cleanout / Maintenance (Haul Roads, Ponds, LCS, Underdrain, and Landfill)	$ 20,240,000	LUMP	1	$ 20,240,000
	Dust Control	$ 11,500,000	LUMP	1	$ 11,500,000
				Subtotal	**$ 126,820,000**
				O&M Total	**$ 221,107,172**

CASE STUDY:	Ravine B
STORAGE CAPACITY (MCY):	34.2
CAPITAL COST ($1 MILLION):	$180
O&M COST ($1 MILLION):	$221
TOTAL CAPITAL AND O&M COST ($1 MILLION):	$401
($/CY):	$11.73

NOTES:

1. Costs are for comparison of case studies only as described in Section III of report. Contingencies were not applied except as noted in Appendix III.D-1.
2. Costs were developed including only line items which are anticipated to be significantly different between case studies. "Common cost" items anticipated to be similar in cost for all case studies are not included (e.g. project management, or the conditioning and treatment of CCR prior to transit from TC Station). Minor construction and operations costs are not included due to the conceptual nature of the design. Examples of these cost items include: minor utility line relocations, minor erosion and sedimentation/stormwater management controls, surface and groundwater testing, mowing.
3. Costs are calculated on 2012 dollar basis (except as noted in Appendix III.D-1). No inflation or discount rates included.
4. Assumes average cost ($5,338 per acre) for Indiana Bat mitigation as described in Support Document III.D-1-4.
5. Does not include costs for leachate treatment or transport system. See Appendix III.D-1 for more information.
6. Additional Capital and O&M costs include costs previously omitted from (GAI 2014) cost analysis but added to the Case Study analysis due to comparison of landfill vs. non-landfill (e.g. mine) Site Alternatives. See Appendix III.D-1 for [illegible]rmation.

TABLE III.D-2
Cost Comparison Summary of Lee Bottom Alternative [1,2,3]

		Unit Costs	Unit	Lee Bottom Quantity	Lee Bottom Cost
CAPITAL COSTS					
	General Project / Permitting / Infrastructure Cost Impacts				
1	Property Acquisition	$ 12,000	Acre	1,656	$ 19,872,000
2	Clearing, Grubbing, and Site Preparation	$ 17,000	Acre	463	$ 7,871,000
3	Large Utility Line Relocation (345 kV Single Circuit)	$ 880	LF	0	$ -
4	Fencing	$ 50	LF	48,471	$ 2,423,550
5	Environmental Wetland Mitigation (cost based on adjusted mitigation units)	$ 72,000	Acre	6.38	$ 459,360
6	Environmental Stream Mitigation (cost based on adjusted mitigation units)	Varies	LF	16,874	$ 3,121,602
7	Cultural Resources	Varies	EA	1	$ 1,831,000
8	Indiana Bat Mitigation[4]	$ 5,338	Acre	463	$ 2,471,494
9	Road Relocation (County Road)	$ 350	LF	2,994	$ 1,047,900
10	Road Relocation (State Road)	$ 400	LF	0	$ -
				Subtotal	$ 39,097,906
	CCR Transportation				
11	Pipe Conveyor Transport (North Ridge Top)	$ 2,150	LF	0	$ -
12	Pipe Conveyor Transport (Ogden Ridge Road Path)	$ 2,425	LF	0	$ -
13	Pipe Conveyor Transport (South Ridge Top)				
	Additional O&M Costs				
47	Additional O&M Costs[6]				
	CCR Placement, Compaction, Survey, and QA/QC	$ 95,080,000	LUMP	1	$ 95,080,000
	Cleanout / Maintenance (Haul Roads, Ponds, LCS, Underdrain, and Landfill)	$ 22,170,000	LUMP	1	$ 22,170,000
	Dust Control	$ 11,500,000	LUMP	1	$ 11,500,000
				Subtotal	$ 128,750,000
				O&M Total	$ 345,477,936

CASE STUDY:	Lee Bottom
STORAGE CAPACITY (MCY):	34.2
CAPITAL COST ($1 MILLION):	$184
O&M COST ($1 MILLION):	$346
TOTAL CAPITAL AND O&M COST ($1 MILLION):	$530
($/CY):	$15.51

NOTES:

1. Costs are for comparison of case studies only as described in Section III of report. Contingencies were not applied except as noted in Appendix III.D-1.
2. Costs were developed including only line items which are anticipated to be significantly different between case studies. "Common cost" items anticipated to be similar in cost for all case studies are not included (e.g. project management, or the conditioning and treatment of CCR prior to transit from TC Station). Minor construction and operations costs are not included due to the conceptual nature of the design. Examples of these cost items include: minor utility line relocations, minor erosion and sedimentation/stormwater management controls, surface and groundwater testing, mowing.
3. Costs are calculated on 2012 dollar basis (except as noted in Appendix III.D-1). No inflation or discount rates included.
4. Assumes average cost ($5,338 per acre) for Indiana Bat mitigation as described in Support Document III.D-1-4.
5. Does not include costs for leachate treatment or transport system. See Appendix III.D-1 for more information.
6. Additional Capital and O&M costs include costs previously omitted from (GAI 2014) cost analysis but added to the Case Study analysis due to comparison of landfill vs. non-landfill (e.g. mine) Site Alternatives. See Appendix III.D-1 for more information.

TABLE III.D-3
Cost Comparison Summary of
Sterling Ventures Mine Alternative[1,2,3]

		Unit Costs	Unit	Sterling Ventures Mine	
				Quantity	Cost
CAPITAL COSTS					
	General Project / Permitting / Infrastructure Cost Impacts				
1	Property Acquisition	$ 12,000	Acre	307	$ 3,684,000
2	Clearing, Grubbing, and Site Preparation	$ 17,000	Acre	290	$ 4,930,000
3	Large Utility Line Relocation (345 kV Single Circuit)	$ 880	LF	0	$ -
4	Fencing	$ 50	LF	25,833	$ 1,291,650
5	Environmental Wetland Mitigation (cost based on adjusted mitigation units)	$ 72,000	Acre	0.67	$ 48,240
6	Environmental Stream Mitigation (cost based on adjusted mitigation units)	Varies	LF	15,521	$ 3,274,245
7	Cultural Resources	Varies	EA	1	$ 1,131,000
8	Indiana Bat Mitigation[4]	$ 5,338	Acre	290	$ 1,548,020
9	Road Relocation (County Road)	$ 350	LF	0	$ -
10	Road Relocation (State Road)	$ 400	LF	0	$ -
				Subtotal	**$ 15,907,155**
	CCR Transportation				
11	Pipe Conveyor Transport (North Ridge Top)	$ 2,150	LF	10,687	$ 22,977,050
12	Pipe Conveyor Transport (Ogden Ridge Road Path)	$ 2,425	LF	0	$ -
	Additional O&M Costs				
47	Additional O&M Costs[6]				
	CCR Placement, Compaction, Survey, and QA/QC	$ -	LUMP	1	$ -
	Cleanout / Maintenance (Haul Roads, Ponds, LCS, Underdrain, and Landfill)	$ 7,680,000	LUMP	1	$ 7,680,000
	Dust Control	$ 5,750,000	LUMP	1	$ 5,750,000
				Subtotal	**$ 13,430,000**
				O&M Total	**$ 563,530,164**

CASE STUDY:	Sterling Ventures Mine
STORAGE CAPACITY (MCY):	33.7
CAPITAL COST ($1 MILLION):	$100
O&M COST ($1 MILLION):	$564
TOTAL CAPITAL AND O&M COST ($1 MILLION):	$664
($/CY):	$19.71

NOTES:

1 Costs are for comparison of case studies only as described in Section III of report. Contingencies were not applied except as noted in Appendix III.D-1.

2 Costs were developed including only line items which are anticipated to be significantly different between case studies. "Common Cost" items anticipated to be similar in cost for all case studies are not included (e.g. project management, or the conditioning and treatment of CCR prior to transit from TC Station). Minor construction and operations costs are not included due to the conceptual nature of the design. Examples of these cost items include: minor utility line relocations, minor erosion and sedimentation/stormwater management controls, surface and groundwater testing, mowing.

3 Costs are calculated on 2012 dollar basis except as noted in Appendix III.D-1. No inflation or discount rates included.

4 Assumes average cost ($5,338 per acre) for Indiana Bat Mitigation as described in Support Document III.D-1-4.

5 Does not include costs for leachate treatment or transport system. See Appendix III.D-1 for more information.

6 Additional Capital and O&M costs include costs previously omitted from (GAI 2014) cost analysis but added to the Case Study analysis due to comparison of landfill vs. non-landfill (e.g. mine) Site Alternatives. See Appendix III.D-1 for r mation.

TABLE III.D-4
Cost Comparison Summary of
Valley View Municipal Solid Waste (MSW) Landfill [1,2,3]

		Unit Costs	Unit	Valley View MSW Landfill	
				Quantity	Cost
CAPITAL COSTS					
	General Project / Permitting / Infrastructure Cost Impacts				
1	Property Acquisition	$ 12,000	Acre	0	$ -
2	Clearing, Grubbing, and Site Preparation	$ 17,000	Acre	0	$ -
3	Large Utility Line Relocation (345 kV Single Circuit)	$ 880	LF	0	$ -
4	Fencing	$ 50	LF	0	$ -
5	Environmental Wetland Mitigation (cost based on adjusted mitigation units)	$ 72,000	Acre	0	$ -
6	Environmental Stream Mitigation (cost based on adjusted mitigation units)	Varies	LF	0	$ -
7	Cultural Resources	Varies	EA	0	$ -
8	Indiana Bat Mitigation[4]	$ 5,338	Acre	0	$ -
9	Road Relocation (County Road)	$ 350	LF	0	$ -
10	Road Relocation (State Road)	$ 400	LF	0	$ -
				Subtotal	$ -
	CCR Transportation				
11	Pipe Conveyor Transport (North Ridge Top)	$ 2,150	LF	0	$ -
12	Pipe Conveyor Transport (Ogden Ridge Road Path)	$ 2,425	LF	0	$ -
13	Pipe Conveyor Transport (South Ridge Top)	$ 2,425	LF	0	$ -
47	Additional O&M Costs[6]				
	CCR Placement, Compaction, Survey, and QA/QC	$ -	LUMP	1	$ -
	Cleanout / Maintenance (Haul Roads, Ponds, LCS, Underdrain, and Landfill)	$ -	LUMP	1	$ -
	Dust Control	$ -	LUMP	1	$ -
				Subtotal	$ -
				O&M Total	$ 1,224,039,180

CASE STUDY:	Valley View MSW Landfill
STORAGE CAPACITY (MCY):	33.7
CAPITAL COST ($1 MILLION):	$3
O&M COST ($1 MILLION):	$1,224
TOTAL CAPITAL AND O&M COST ($1 MILLION):	$1,227
($/CY):	$36.45

NOTES:

1. Costs are for comparison of case studies only as described in Section III of report. Contingencies were not applied except as noted in Appendix III.D-1.
2. Costs were developed including only line items which are anticipated to be significantly different between case studies. "Common Cost" items anticipated to be similar in cost for all case studies are not included (e.g. project management, or the conditioning and treatment of CCR prior to transit from TC Station). Minor construction and operations costs are not included due to the conceptual nature of the design. Examples of these cost items include: minor utility line relocations, minor erosion and sedimentation/stormwater management controls, surface and groundwater testing, mowing.
3. Costs are calculated on 2012 dollar basis except as noted in Appendix III.D-1. No inflation or discount rates included.
4. Assumes average cost ($5,338 per acre) for Indiana Bat mitigation as described in Support Document III.D-1-4.
5. Does not include costs for leachate treatment or transport system. See Appendix III.D-1 for more information.
6. Additional Capital and O&M costs include costs previously omitted from (GAI 2014) cost analysis but added to the Case Study analysis due to comparison of landfill vs. non-landfill (e.g. mine) Site Alternatives. See Appendix III.D-1 for more information.

Table III.E-1. Environmental and other considerations for the case study alternatives.

Issue	Ravine B	Lee Bottom	Sterling Venture	Valley View
Streams	Impacts to approximately 87,254 lf of jurisdictional intermittent and ephemeral streams; mitigation to be provided.	Impacts to approximately 23,420 lf of jurisdictional streams; mitigation to be provided.	Impacts to approximately 15,521 lf of jurisdictional streams; mitigation to be provided.	Unknown but minor impacts if and when landfill must be expanded.
Wetlands	Impacts to approximately 2.58 ac of wetlands; mitigation to be provided.	Impacts to approximately 5.37 ac of wetlands; mitigation to be provided.	Impacts to approximately 0.17 ac of wetlands; mitigation to be provided.	Unknown but minor impacts if and when landfill must be expanded.
Threatened and Endangered Species	Potential impacts to habitat for Indiana bat and northern long-eared bat; mitigation to be provided.	Potential impacts to habitat for Indiana bat and northern long-eared bat; mitigation to be provided.	Potential impacts to habitat for Indiana bat and northern long-eared bat; mitigation to be provided.	No issues identified.
Karst	Conceptual design avoids all but a few small solution features.	Not known if this could become a major issue	Not expected to be a major issue.	Not expected to be a major issue.
Cultural or Historic Resources	Conceptual design avoids known sites of potential historical interest.	Expectation is that extensive cultural resources, surveys and mitigation will be required.	Some potential for sites to be identified and mitigation required.	Impacts could occur if and when landfill is expanded.
Cemeteries	The conceptual design avoids the one relatively large cemetery.	The conceptual design avoids the identified cemetery.	None identified that require avoidance.	Not an issue at this site.
Air Quality	Very limited air quality impacts.	Some impacts due to transport.	Some impacts due to transport.	Emissions from near constant truck traffic.
Public Safety	No issues identified.	Barge transport creates some risks. Truck transport required as back up if river is closed to traffic.	Barge transport creates some risks. Truck transport required as back up if river is closed to traffic.	Significant public safety issues due to near- constant truck transport of county roads for the project life.
Aesthetics	Some aesthetic impact beyond buffer properties.	Existing rural setting converted to industrial site.	Some impacts along transportation route.	Impacts are those of existing major solid waste landfill.
Noise	Some noise impact beyond buffer properties.	Existing rural setting converted to industrial site.	Minimal impacts except at existing mine site.	Impacts are those of existing major solid waste landfill.
Other	Much of the impacted land has been acquired by LG&E.	Existing community and air field will be displaced.	Unknown effects from disposal of CCR below water table and without liner or leachate treatment.	Quality of life impacts along heavily traveled road, with residences, school bus routes, river.

Table IV.A-1. Complete list of alternatives evaluated by GAI on behalf of LG&E

Name	Identification in GAI (2014)
No Action	1
Beneficial Re-Use	2
Dickey Farm	3A
Ravine C	3B
Ridge Tops	3C
Ravine B	3D
North River Terrace and Corn Creek Valley	4A
South River Terrace-1 and Liter's Quarry	4B
South River Terrace-2 and South River Terrace-3	4C
Connor Ridge Road ridge tops	4D
Bethlehem Terrace	5A
Lee Bottom	5B
Spring Creek Terrace	5C
Cooper Bottom	5D
Other Barge Accessible Opportunities: Ohio River	5E
Ghent Station Landfill	5F
CCR landfills Developed by Others	6A
Sand and Gravel Quarries	6B
Limestone Aggregate Quarry	6C
Coal Mines	6D
Existing Landfills	6E
2 waste landfill sites in southern coves of Ravine B	3E MACTEC Case 16
Same as above, but avoids cemetery	3E MACTEC Case 16: Cem. Avoidance
1 waste landfill in the majority of southern Ravine B	3F MACTEC Case 23
Upper portion of the northern hollow of Ravine B	Plan IIB-3G GAI Lime Cave Avoidance
Lime Avoidance: Southern Expansion	3G-IIC-4A
Lime Avoidance: Northern Road	3G-IIC-4B-1A
Lime Avoidance: Upper Reaches, South Side Ravine B	3G-IIC-4B-1B
Lime Avoidance: Same as above with Beneficial Reuse	3G-IIC-4B-1B-BR
Lime Avoidance: Same as 4B-1B with different roads	3G-IIC-4B-1B-IC
Lime Avoidance: Same as above with Beneficial Reuse	3G-IIC-4B-1C-BR
Lime Avoidance: Ravine A	3G-IIC-5A
South Campbell Lane Ravine	4E Browning Branch Tributary Ravine
Barebone Creek Ravine	4F Barebone Tributary Ravine
Dickey Farm; Ravine C; Ridge Tops	Combination 1
South River Terrace-1-East; Barebone Tributary Ravine	Combination 2
Dickey Farm; Ravine C; N. River Terrace & Corn Creek	Combination 3
4B and 4C	Combination 4
4A and 4D	Combination 5
3B and 4F	Combination 6
3B and 3E MACTEC Case 16	Combination 7
3B and 3F MACTEC Case 23	Combination 8
3F MACTEC Case 23 and 4F	Combination 9
3E MACTEC Case 16 and 4F	Combination 10

Continued on next page.

Table IV.A-1. Complete list of alternatives evaluated by GAI on behalf of LG&E
Page 2

Name	Identification in GAI (2014)
3B and 4A	Combination 11
4B and 4C	Combination 12
4A and 4B	Combination 13
4D and 3A	Combination 14
3A and 3E MACTEC Case 16	Combination 15
4D and 3B	Combination 16
Same as above but avoids cemetery	Combination 16: Cem. Avoidance
4D and 3C	Combination 17
Sterling Ventures LLOC Limestone Mine	Not included in Alternatives Analysis

Table IV.A-2. Alternatives identified in GAI (2014) and not considered for additional analysis in Section IV of this Supplement.

Name	ID in GAI (2014)	Rationale for not including in Section IV
No Action	1	Clearly cannot meet project purpose.
Beneficial Reuse	2	Assessed in Attachment 1 of GAI (2014) and further discussed in Supplement, Appendix III.C-1. No certainty exists as to how much, if any, beneficial reuse can be relied upon. High rate of reuse is too speculative to be considered.
Ravine B	3D	Permit for this alternative was denied by State due to applicability of Cave Protection Act to Lime Cave.
MACTEC Case 16 (2LA-N and 1LG-N)	3E	EPA is seeking alternatives to Ravine B. Alternatives that do not substantially reduce impacts to Ravine B are considered as not responsive to EPA's concerns. These alternatives were considered in detail in GAI (2014).
MACTEC Case 16-Cemetery Avoidance	3E-Cemetery Avoidance	Same as above.
MACTEC Case 23 (12LCH-N)	3F	Same as above.
GAI "Lime Cave" Avoidance Study Alternative	3G	Same as above.
Southern Expansion	3G-IIC-4A	Same as above.
Northern Road	3G-IIC-4B-1A	Same as above.
Southern Road	3G-IIC-4B-1B	This is the alternative previously determined to be Least Environmentally Damaging Practicable Alternative and is the subject of a Case Study in Section III of this report, hence not repeated in Section IV.
Southern Road (30% Beneficial Reuse)	3G-IIC-4B-1B-BR	EPA is seeking alternatives to Ravine B. Alternatives that do not substantially reduce impacts to Ravine B are considered as not responsive to EPA's concerns.
Decoupled	3G-IIC-4B-1B-IC	Same as above.
Decoupled (30% Beneficial Reuse)	3G-IIC-4B-1C-BR	Same as above.
Ravine A	3G-IIC-5A	This would simply shift impacts to Ravine A from Ravine B and is presumed to not be responsive to EPA's position regarding impacts to Ravine B.
Lee Bottom	5B	Recommended by EPA for additional evaluation, and is the subject of a Case Study in Section III of this report, hence not repeated in Section IV.
Other Barge Accessible Opportunities on the Ohio River	5E	This was a conceptual alternative and is effectively represented by the Case Study of Lee Bottom Terrace in Section III.
Ghent Station Landfill	5F	This option is considered to be effectively represented by the Sterling Ventures Mine Case Study in Section III, as that project was originally conceived of as a Ghent Station landfill.
CCR landfills Developed by Others	6A	This was a conceptual alternative and is effectively represented by the Case Study of Valley View Municipal Solid Waste Facility in Section III
Sand and Gravel Quarries	6B	See GAI (2014); EPA generally advises against use of quarries for CCR disposal, and in this area such quarries would likely be in a floodplain with excavation required below the water table.

Table IV.A-2. Alternatives identified in GAI (2014) and not considered for additional analysis in Section IV of this Supplement.
Page 2.

Name	ID in GAI (2014)	Rationale for not including in Section IV
Limestone Aggregate Quarry	6C	This was a conceptual alternative and is effectively represented by the Case Study of Sterling Ventures Mine Case Study in Section III, which involves a limestone mine.
Coal Mines	6D	This was a conceptual alternative with no known practical sites. It is effectively represented by the Case Study of Sterling Ventures Mine Case Study in Section III.
Existing Landfills (Valley View MSW Landfill)	6E	This alternative is the subject of a Case Study in Section III and that assessment is not repeated in Section IV.
3B Ravine C, 3E MACTEC Case 16 (2LA-N Only)	Combination 7	EPA is seeking alternatives to Ravine B. Alternatives that do not substantially reduce impacts to Ravine B are considered as not responsive to EPA's concerns
3B Ravine C, 3F MACTEC Case 23 (12LCH-N)	Combination 8	Same as above.
3F MACTEC Case 23 (12LCH-N), 4F Barebone Tributary Ravine	Combination 9	Same as above.
3E MACTEC Case 16 (2LA-N Only), 4F Barebone Tributary Ravine	Combination 10	Same as above.
3A Dickey Farm, 3E MACTEC Case 16 (2LA-N Only)	Combination 15	Same as above.

Table IV.A-3. Alternatives identified in GAI (2014) and considered for additional analysis in Section IV of this Supplement. Note: the prior Alternatives Analysis (GAI, 2014) is provided as Support Document 1 to this Supplement.

ID in this report	Name	Alternatives Analysis ID
A.	Dickey Farm	3A
B.	Ravine C	3B
C.	Ridge Tops	3C
D.	North River Terrace and Corn Creek Valley	4A
E.	South River Terrace-1 and Liter's Quarry	4B
F.	South River Terrace-2 and South River Terrace-3	4C
G.	Connor Ridge Road ridge tops	4D
H.	Browning Branch Tributary Ravine	4E
I.	Barebone Tributary Ravine	4F
J.	Bethlehem Terrace	5A
K.	Spring Creek Terrace	5C
L.	Cooper Bottom	5D
M.	3A Dickey Farm, 3B Ravine C, 3C Ridge Tops	Combination 1
N.	4B South River Terrace-1-East, Barebone Tributary Ravine	Combination 2
O.	3A Dickey Farm, 3B Ravine C, North River Terrace, Corn Creek Valley	Combination 3
P.	4B South River Terrace-1-East/West, Liter's Quarry, 4C South River Terrace-2/3	Combination 4
Q.	4A Corn Creek Valley, 4D Ridge Tops	Combination 5
R.	3B Ravine C, 4F Barebone Tributary Ravine	Combination 6
S.	3B Ravine C, 4F Barebone Tributary Ravine-Cemetery Avoidance	Combination 6-Cemetary Avoidance
T.	3B Ravine C, 4A North River Terrace, Corn Creek Valley	Combination 11
U.	4B South River Terrace-1-East, 4C South River Terrace-3	Combination 12
V.	4A Corn Creek Valley, 4B South River Terrace-1-East	Combination 13
W.	4D Ridge Tops, 3A Dickey Farm	Combination 14
X.	4D Ridge Tops, 3B Ravine C	Combination 16
Y.	4D Ridge Tops, 3C Ridge Tops (Landfill-1 Only)	Combination 17

APPENDIX III.B-3.
Description of Sterling Ventures Mine Case Study

APPENDIX III.B-3. DESCRIPTION OF STERLING VENTURES MINE CASE STUDY

A. CASE STUDY OVERVIEW

Case study alternative Sterling Ventures Mine would consist of CCR placement inside of the voids in mined out sections of a currently operating underground limestone mine. Other aspects of development would include associated ancillary facilities in currently undeveloped areas east of the Ohio River. CCR would be transported up the Ohio River via barge, loaded onto an enclosed pipe conveyor, and conveyed to a vertical mineshaft and ultimately placed in the underground mine. A haul road and bridge(s) would be constructed to parallel the pipe conveyor. LG&E would be responsible for the transport of the material from TC Station to the vertical mineshaft at Sterling Ventures mine. Sterling Ventures would be responsible for all subsequent CCR management and would require a tipping or disposal fee in order to dispose of the CCR material in the existing mine.

Overview maps related to this case study are as follows. (Note: "SV" is an abbreviation of Sterling Ventures Mine.)

- Figure III.A-1 in the main body of this report shows the location of all four case studies.
- Figure SV-1 is a planimetric map of Sterling Ventures Mine and vicinity with various landmarks identified.
- Figure SV-2 is a topographic map of the Sterling Ventures mine site showing key features of the CCR disposal project.
- Figure SV-3 is a cross-section view of the Sterling Ventures Underground mining operation.
- Figure SV-4 is a Google Earth air photo which provides an oblique view of the site looking southeast.

B. PROJECT SITE

1. Location

General location. Sterling Ventures Mine is located in northern Gallatin County, Kentucky approximately five miles west of Verona, KY and nine miles northeast of Warsaw, Kentucky. The surface entrance to the mine is approximately 2 miles east from the Ohio River (approximate River Mile 517).

Location coordinates. The approximate coordinates of the existing surface entrance to the mine is N 38° 49' 56.86", W-85° 45' 15.12".

2. Description

General. Sterling Ventures Mine is a limestone mine situated in the watershed of one of two Unnamed Tributaries to Big South Fork, a tributary to the Ohio River. The project area consists of both bottomland and upland settings. Bottomland (floodplain and terrace) settings are located on the northwest edge of

the project area along the Ohio River. The remainder of the project area is located in highly dissected uplands and includes narrow bottomlands and ravines, narrow ridgetops, and ridge side slopes.

There are very few roads (paved or unpaved) running through the project area. Figure SV-2 shows the public roads in the area.

There are very few structures within the project area. A few buildings are located on Steele Creek Road along the Ohio River; however, these appear to be just outside of the vicinity. There is a dwelling and outbuilding at the terminus of Steele Creek Road near Big South Fork. There is also a dwelling and two outbuildings along the trail.

Three utility line corridors run through or in the vicinity of the project area. A pipeline runs in a northeast-southwest direction crossing near the center of the project area. A transmission line crosses on the eastern end of the project area. A shorter, service transmission line runs from this utility line to an industrial complex (Sterling Ventures Mine) outside of the southeast end of the project area.

Two large man-made lakes are located within the project area between Sterling Ventures Mine and the main transmission line. Service roads are located between the mine area and these lakes. Two other lakes are shown on ridgetop settings within the project area.

Topography and drainage. The bottomland settings (floodplains and terraces), located along the Ohio River, are narrow with hillsides hugging the terrace edge. Uplands locations are dissected by several stream drainage valleys and ravines including Big South Fork, unnamed tributaries of Big South Fork, and two unnamed tributaries of the Ohio River, Steele Creek, and unnamed tributaries of Steele Creek. Elevation varies from approximately 455 (Ohio River elevation) to 840 Above Mean Sea Level (AMSL) (along the ridgetops in uplands).

Geology, groundwater and soils. The following information is based on the geologic map and karst potential map available on-line from the Kentucky Geologic Map Information Service.

The rocks underlying the site are of Ordovician age. They include the following geology and karst potential for the rock units outcropping at the surface, starting from the highest to the lowest elevation on site.

- Bull Fork Formation (Ob) –limestone and shale, low karst potential
- Grant Lake Limestone-limestone, minor shale, medium karst potential (unit is no more than five feet thick, unimportant at site.)
- Fairview Formation (Of)-limestone and shale, low karst potential
- Kope Formation (Ok) –shale and limestone, non-karst
- Point Pleasant Formation (Ocp)-limestone and shale-low karst

As noted, only the Grant Lake limestone has a medium karst potential. Most of the other units on site have a low karst potential with the exception of the Kope Formation, which is considered to be non-karst. There are no identified sinkholes mapped on or near the property.

Preliminary desktop investigations show that the soils found in the bottomland (floodplain and terraces) settings fall primarily within the Wheeling-Huntington Alluvial land soil association. This soil association consists of nearly level to steep soils located on floodplains and terraces. Soils found in the upland settings fall primarily within the Eden soil association, which is characterized by moderately steep to strongly sloping upland soils with underlying clayey subsoil. These soils are underlain by calcareous shale interbedded with limestone and siltstone. A large portion of the upland soils are classified as Eden flaggy silt clay, 20 to 30 percent slopes, and severely eroded soils. These soils are typically found on sideslopes with a parent material of clayey residuum weathered from calcareous limestone and shale.

Land use and vegetation. The existing land use is undisturbed/forested and industrial with very little to no residences currently occupying the immediate area. The steep hillsides and above ridgetops are largely undisturbed and contain forested ravines and very little agricultural activity. The eastern portion of the project area has been disturbed by the existing Sterling Ventures mine, and is largely industrial in nature.

Ownership. The areas proposed to be used under this alternative proposal include three property parcels, two of which are currently owned by Sterling Land Co LLC, and the third owned by Gallatin County Fiscal Court. Unlike other Case Study Alternatives, it is not assumed that the entire property would need to be purchased if any portion of it was needed to build the ancillary facilities. This exception is due to Sterling Ventures' intent to continue operating the mine; LG&E would have no interest in the capital expense and assumption of potential liability that would be required if it were to acquire the entire SV property, including the site of an active mining operation.

Additionally, the existing parcels are so large (approximately 1400 acres) that LG&E would take measures to avoid the purchase of the entire property, either through subdividing or acquiring easement(s). Therefore, for the purpose of this study, only the land estimated to be required in order to construct the ancillary features (barge unloading facility, pipe conveyor, and haul road/bridge(s)) were assumed to require purchase by LG&E.

100-year Floodplain. The 100-year Ohio River floodplain as mapped by FEMA is shown on Figure SV-2. According to Sterling Ventures, the existing underground limestone mine is not within the 100-year floodplain. However the barge loading facility at TC Station, unloading facility at Sterling Ventures, and a portion of the haul road and pipe conveyor system leading to the mine would have to encroach on the 100-year floodplain and possibly the floodway.

Cemeteries. Several cemeteries are located outside of the study area as identified in the Phase Ia Cultural Resources Literature Research, but no mapped cemeteries are located within the proposed project area. As discussed in Appendix III.C-1, LG&E's practice is to design CCR facilities to avoid cemeteries. The report attached to this appendix summarizes the finding of the cultural resources literature research completed for the Sterling Ventures Mine and surrounding vicinity.

Based on the results of the cultural resources literature research report, there are no previously recorded archaeological site or architectural/historical resources within the Sterling Ventures area. There are also

no mapped cemeteries in the area. Map research does indicate that there are likely unrecorded historic archaeological sites and architectural resources within the area. There is also a moderate to high potential for prehistoric sites.

Other features. Local roads and minor utility lines such as water lines, distribution lines, and communication lines may need to be relocated to construct the barge unloading facility, pipe conveyor, haul road and bridges, but these relocations have not been identified or quantified in this study due to their minor costs in relation to other capital and operating expense considerations.

C. PROJECT DESCRIPTION

Figure SV-2 is a topographic map of Sterling Venture Mine showing key features of the CCR disposal project including the transportation facilities, the mine location, assumed location of vertical mine shaft (approximate centroid of existing Sterling Ventures property), and other project attributes.

CCR Disposal Facility Concept. The proposal under this alternative would be to dispose of the Coal Combustion Residuals (CCRs) inside of the mine voids in mined out sections of the active underground limestone mine, therefore no surface landfill would be present. However, ancillary facilities would be required to be constructed for the purpose of transporting the material to the mine.

LG&E and Sterling Ventures, LLC had previously been in contact regarding placing gypsum from LG&E's Ghent Generating Station. Per recent communications between LG&E and Sterling Ventures, LLC, it is estimated that there is currently space in the mine for at least 5,000,000 cubic yards (CY) of material. At a CCR production rate of approximately 910,000 CY per year at TC Station, this equates to roughly 5.5 years' worth of margin. Sterling Ventures, LLC also states that the current limestone mining rate is between 900,000 and 1,500,000 tons of aggregate per year depending on market conditions. Sterling Ventures does not specifically mention what this mining rate equates to in terms of volume (CY). Assuming a conservative limestone density of 2.0 tons equals one CY[1], the volume of space that is mined out equates to between 450,000 and 750,000 CY each year.

The mining rate at Sterling Ventures would need to increase in order to stay ahead and handle the CCR material generated from TC Station over the life of the Project, i.e. there would need to be nearly forty years of high-volume mining. Additionally, the 910,000 CY per year CCR production estimate assumes a

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1. Although specific density data on High Bridge Group Tyrone and Camp Nelson limestone (the limestones that are mined at Sterling Ventures) were not readily available, a review of typical limestones sourced in the Ordovician geologic period indicates bulk densities range from 2.4 g/cm^{-3} to 2.92 g/cm^{-3}, which equates to 2.02 tons/cy to 2.46 tons/cy, respectively.

Source: (*Manger, Edward. Porosity and Density of Sedimentary Rocks. Geological Survey Bulletin 1144-E: United States Government Printing Office, Washington, 1963.)*

placement and compaction of CCR material at 95% of maximum dry density, therefore placement of the CCR materials would need to follow compaction procedures sufficient enough so that the material is

compressed to an equal or similar dry density. If the material were not placed and compacted correctly, the volume of space that it took up inside of the mine would increase, resulting in even worse margin than estimated herein.

Transportation facilities and practices. The primary mode of CCR transport under this case study alternative would be via river barge and pipe conveyor. A barge loading facility that could handle the capacity of the CCRs generated (910,000 CY/year) at TC Station would be constructed along the Ohio River adjacent to the TC Station. A barge unloading facility would be constructed at the Sterling Ventures Mine location along the Ohio River, approximately 2.5 miles northwest of the existing surface entrance of the mine. A pipe conveyor and haul road would be constructed from the barge unloading facility to the vertical mine shaft location. The exact location of the vertical mine shaft is unknown at this time. For purposes of this study, the vertical mine shaft was assumed to be located at the approximate centroid of the two existing Sterling Ventures property parcels. This location is approximately one mile northwest of the existing surface entrance to the mine, and approximately 1.5 miles southeast of the Ohio River, measured in a straight line.

LG&E is aware of a barge unloading facility in Warsaw KY that is available for rent, as part of a large office and warehouse complex. This is not considered a viable alternative to construction of the new facility described above. Reasons for not considering the Warsaw facility include: the barge terminal is small with limited access and not appropriate for CCR unloading; CCR from the barge facility would need to be trucked to Sterling Ventures Mine with costs and impacts similar to those reported for Valley View landfill; LG&E could not justify paying rent for an office facility for which it has no use.

A description of the material handling process assumed in this alternative from the TC Station to the mine is as follows.

- The CCR material would be transported via conveyor from TC Station's Treatment and Transportation (T&T) handling facility to a newly constructed barge loading facility adjacent to TC Station.
- The CCR material would be loaded onto the barges via a conveyor and truss loading structure with the capability to transport 800 tons of material per hour at 75% efficiency for 8 hours per day and 250 days per year. The loading structure would disperse material into one of eight open hopper barges with a minimum capacity of 1200 tons.
- A tug or push boat is utilized to transport four loaded barges approximately 55 miles upriver to the new Sterling Ventures barge unloading facility.
- The CCR material would be unloaded from the barges onto a pipe conveyor system via a bridge style continuous unloader with the capability to remove 800 tons per hour at 75% efficiency for eight hours per day and 250 days per year.
- The CCR material would be transported by pipe conveyor approximately 2 miles cross country to the assumed vertical shaft location and dumped directly into the mine shaft specifically designed for CCR placement. The cost to construct this mine shaft is not included in this estimate.

- Sterling Ventures would be responsible for the moving, placement, and compaction of CCR materials once inside of the mine. A tipping fee, assumed at $10.15/ton based on recent communication from Sterling Ventures to LG&E would be incurred for Sterling Ventures to accept the material from LG&E (see "Response from Sterling Ventures, LLC to LG&E Concerning CCR Placement in Sterling Ventures Mine" attached to this Appendix).

During times where the barge transport system would be unable to be utilized, due to adverse river conditions (i.e. flooding or freezing), or barge facility maintenance/downtime, the CCR material would need to be hauled via truck to the mine or to a separate CCR disposal facility. The truck route from the TC Station to the Sterling Ventures mine facility is approximately 100 miles round trip utilizing public roads.

Ancillary Facilities. According to Sterling Ventures, the mine is essentially dry in that water does not migrate into the mine through the limestone. Water is collected from the surface entrance of the mine and used in dust control inside of the mine. Therefore, it is assumed that no leachate or effluent treatment would be required under this alternative. This assumption would lead to a significant understatement of project logistics and costs if it proves to be incorrect.

Conceptual borrow areas. This case study alternative analysis assumes that no composite liner system or cover system would be required for placement of CCR material inside of the mine. Therefore, low permeability clay/soil is not needed and borrow areas are not considered.

Protected or avoided areas. The location of the Sterling Ventures Limestone mine is outside of the FEMA 100-year floodplain, however ancillary facilities such as barge unloading area and a portion of the haul road/pipe conveyor infrastructure would take place inside the 100-year floodplain.

Relocations. As described above, local roads and minor utility lines such as water lines, distribution lines, and communication lines may need to be relocated as part of this project but have not been quantified in this study due to their minor costs in relation to other capital and operating expense considerations.

Area to be disturbed. The Sterling Ventures mine is completely underground and therefore no ground area will be disturbed during CCR placement operations. However, the construction of ancillary facilities, such as an unloading facility, pipe conveyor, haul road, and vertical mine shaft will cause disturbance. An estimated total of 307 acres would be disturbed, including an estimated 15,521 LF of streams and 0.17 acres of wetlands (based solely on map data) as a result of constructing this project.

Permitting and other risks. There are a number of other risks that would be taken by LG&E under the proposed Sterling Ventures Mine Site Alternative. These risks relate to the viability of achieving the project objective of 37 years of reliable CCR disposal at a cost that can be reliably predicted. A public utility such as LG&E, inherently pursues plans that minimize risks to safe and efficient generation of electricity. The potential risks associated with the Sterling Ventures Mine include the following.

1. As stated above, the current available storage in the mine is estimated at 5,000,000 cubic yards, which represents approximately 5.5 years of TC Station CCR generation margin (i.e. if the

mine were to stop producing limestone, LG&E would immediately need to develop a new CCR disposal plan).

2. As stated above, estimated mining rate is between 900,000 and 1,500,000 tons of limestone per year. When converted to a volume basis using the assumed specific density described above (2.0 tons per CY), this mining rate equates to 450,000 to 750,000 CY yards per year, which is a deficit of 460,000 to 160,000 CY per year when compared to TC Station CCR generation. In order for the Sterling Ventures mine to accept all TC Station CCR material, the existing mining rate would need to increase. Otherwise, LG&E would need to identify a back-up plan to dispose of the CCR material in excess of the mining rate, such as trucking to Valley View MSW Landfill.

3. Another observation is that according to MSHA records, the Sterling Ventures Mine has been operating since July of 1998, although hours worked data is only available since 2003. Even assuming mining started in 2003, and the mine has been in production for approximately 10 years, Sterling Venture's reported current void space of 5 million cy would indicate that the average void space added each year has been 500,000 cy per year since 2003. See attached data from MSHA Mine Overview Research at http://www.msha.gov/drs/drshome.htm

4. The current KDWM permit for beneficial reuse of special waste that Sterling Ventures holds would need to be amended to allow CCRs from the TC Station to be placed in the mine. Currently the permit allows only gypsum material from the Ghent Generating Station to be placed in the top level of the mine. The revision to the permit would require, at a minimum submission of Toxicity Characteristic Leachate Procedure (TCLP) testing of each CCR material to be disposed (i.e. fly ash, bottom ash, pyrites and gypsum from TC Station). The KDWM could require a brand new permit application be submitted, and subject to approval. The mine voids are reportedly below the water table, but LG&E does not have information to confirm that no groundwater concerns would arise during the project life.

5. LG&E is not able to determine the effect on the Sterling Ventures alternative resulting from the upcoming EPA final rule which will regulate CCR material pursuant to the Resource Conservation and Recovery Act. For planning purposes, this assessment assumes the project will not be considered as beneficial reuse of CCR, but also that it will not be considered as a conventional landfill. For example, for landfills, the final rule will likely require a composite liner system consisting of a minimum 24 inches of compacted soil with hydraulic permeability of 10^{-7} cm/sec or less, a geomembrane liner, and leachate collection system drainage media. The final rule is also expected to establish requirements for a final cover or cap system consisting of 24 inches of soil. Any type of requirement for a liner and cover system in the underground mine workings would be extremely difficult and expensive to construct. Costs were not developed or included in the tipping fee proposal for any liner or monitoring system of any kind inside of the mine. Nor does the fee reflect any other considerations that may be established under the final CCR disposal Rule.

6. As described above, the primary mode of transporting CCR material from TC Station to Sterling Ventures Mine would be via barge along the Ohio River. While barging is traditionally safer than other modes of operation, such as trucking, there are still risks with shipping CCR materials on a major waterway such as the Ohio River. Flooding or low water levels can slow or halt barge transport altogether, forcing LG&E to develop back-up CCR storage or disposal options.

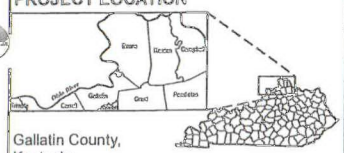
7. Under the conditions described above regarding CCR storage capacity risks as well as anticipated barge transport outages, it can be reasonably assumed that trucking of CCR material would be required at least for interim periods during the Project life under the proposed Sterling Ventures Mine Alternative. Trucking of the material poses many risks as described in Appendix III.B-4 including increasing vehicular accident probability with the amount of additional trucks on the road, aesthetics and noise impacts to neighbors along the haul route, and air quality impacts.

8. There are uncertainties regarding the variability over time of multiple cost items associated with the Sterling Ventures Mine Alternative. Due to fluctuations in fuel costs, barging and trucking costs could cause this alternative to be even more expensive in the future than currently estimated. Additionally, increases in fuel costs could result in the tipping fee paid to Sterling Ventures, LLC to increase. There is no assurance regarding the potential increases in tipping fees or the extent to which costs would be incurred due to items such as additional shafts, increased haulage to new shafts, extensions of pipe conveyors, additional underground handling costs, or regulatory requirements for underground operations.

9. Because this alternative would require a contract with an outside entity, its implementation would be subject to LG&E's procurement process, which in turn is subject to review by KPSC. The outcome of this process cannot be known without actually initiating it, but assuredly would need to address a variety of factors such as Sterling Ventures' experience (including its experience with disposal operations generally and disposal of CCR in particular), its financial viability and creditworthiness, and whether the company's safety record qualifies it as a potential LG&E contractor.



PROJECT LOCATION



Gallatin County, Kentucky

REFERENCE:

Aerial imagery provided by Landair Mapping, World Imagery, 2012, obtained through ESRI World Imagery, Microsoft Corporation, accessed 09/2014

Wetland and Surface Waters based on National Wetlands Inventory data obtained from U.S. Fish and Wildlife Service.

Topographic contours from National Elevation Dataset, provided by U.S. Geological Survey.

Perennial and intermittent streams are based on the National Hydrography Dataset produced by the U.S. Geological Survey and obtained through ESRI. Ephemeral streams interpolated from topographic data and aerial imagery

Horizontal datum and projection is NAD 83, State Plane, Kentucky North, Feet Grid System, Vertical datum is NGVD 88.

LEGEND

- Perennial Stream (based on Nat. Hydrography Data)
- Intermittent Stream (based on Nat. Hydrography Data)
- Ephemeral Stream (Estimated)
- Preliminary Impact Boundary
- Wetlands
- Surface Water

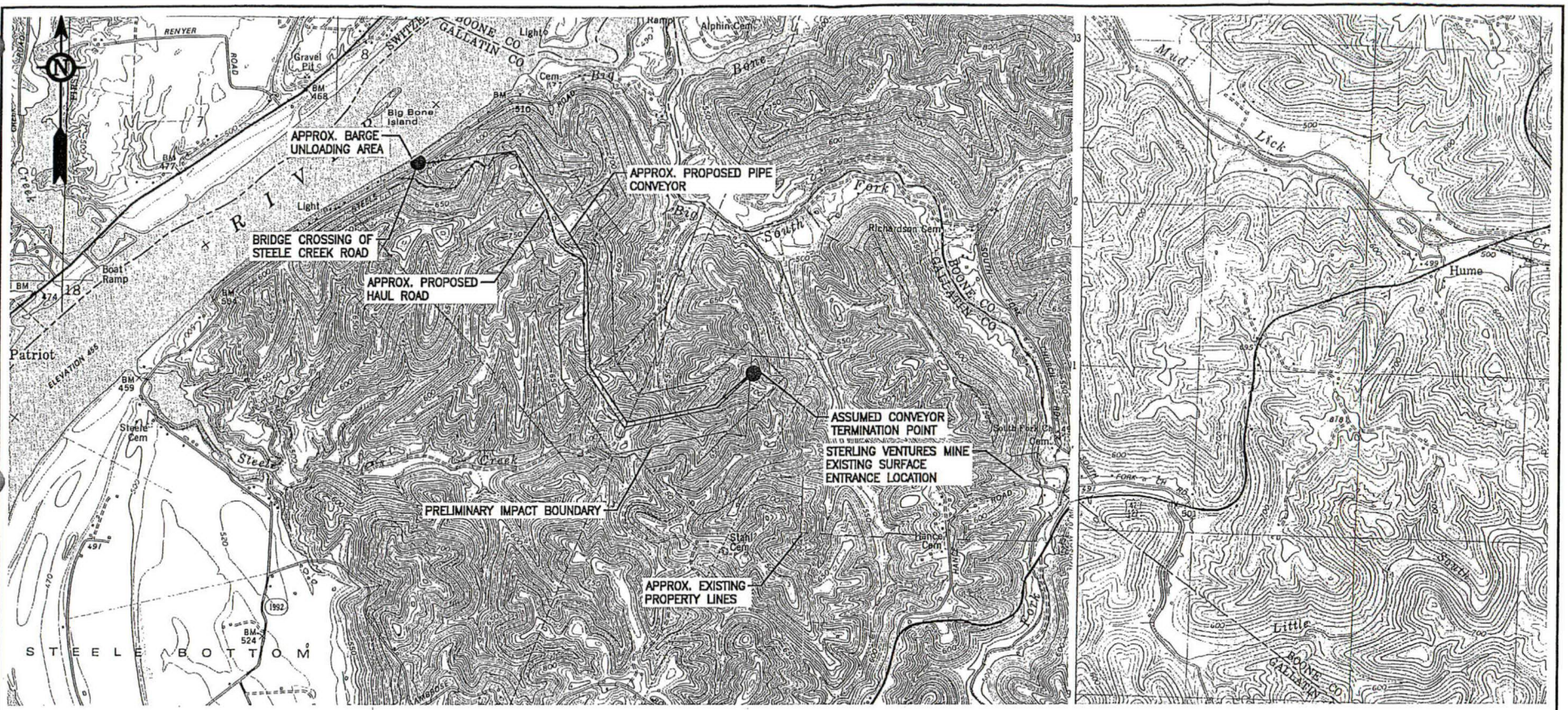
0 1,000 2,000 4,000 Feet

FIGURE SV-1 - PLANIMETRIC MAP
STERLING VENTURES SITE ALTERNATIVE

gai consultants

TRIMBLE COUNTY CCR
LANDFILL PROJECT
LG&E

DRAWN BY: JGS DATE: 11/26/2014
CHECKED: KPR APPROVED: MAF



REFERENCE:
TOPOGRAPHIC MAPPING FROM USGS 7.5 MINUTE QUADRANGLES, BEDFORD (1984), BETHLEHAM (1987), MADISON EAST (1994), & MADISON WEST (1980), KENTUCKY.

NOTE: IMPACT BOUNDARY INCLUDES AREA TO CONSTRUCT AND OPERATE PIPE CONVEYOR AND HAUL ROAD.

SCALE: 1" = 2000'

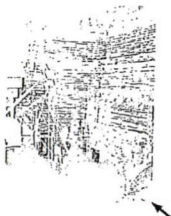
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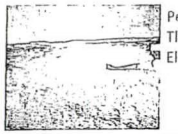
DRAWING TITLE: FIGURE SV-2 – TOPOGRAPHIC MAP		DRAWN BY: RJH	APPROVED BY: KCC
TRIMBLE COUNTY GENERATING STATION LANDFILL SUPPLEMENT TO ALTERNATIVES ANALYSIS	LOUISVILLE GAS & ELECTRIC COMPANY (LG&E) TRIMBLE COUNTY GENERATING STATION TRIMBLE COUNTY, KENTUCKY	CHECKED BY: KPR	DATE: 11/26/2014
		DRAWING NUMBER: SV-2	
		This drawing was produced with computer aided drafting technology and is supported by electronic drawing files. Do not revise this drawing via manual drafting methods.	REVISION
		SCALE: 1"=2000'	SHT. NO. ___ OF ___
PITTSBURGH OFFICE • 385 EAST WATERFRONT DRIVE, HOMESTEAD, PA 15120-5005		GAI DRAWING FILE NO.	C100784-07-007-11-C-SV-2

GAI CAD FILE PATH: P:\PIT\2010\C100784.07 – Plan IIb Final Design CCR\CAD\007 (Other Studies)\CAD Department\Production Drawings\Supplement to AA\C100784-07-007-11-C-SV-2.dwg PLOTTED ON: 11/26/2014 2:52 PM PLOTTED BY: Jeremy Slodowick

Exhibit 6C

Sterling Materials – Verona, KY
Underground Cross Section

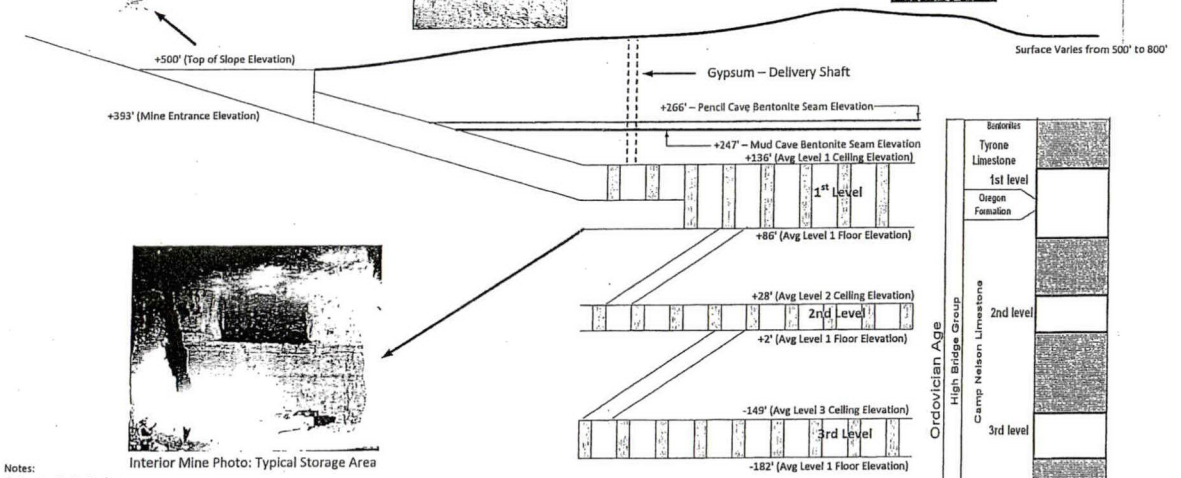




Pencil Cave Bentonite Seam
Thickness: ≈ 18"
Elevation: +266'



Mud Cave Bentonite Seam
Thickness: ≈ 24"
Elevation: +247'



Interior Mine Photo: Typical Storage Area

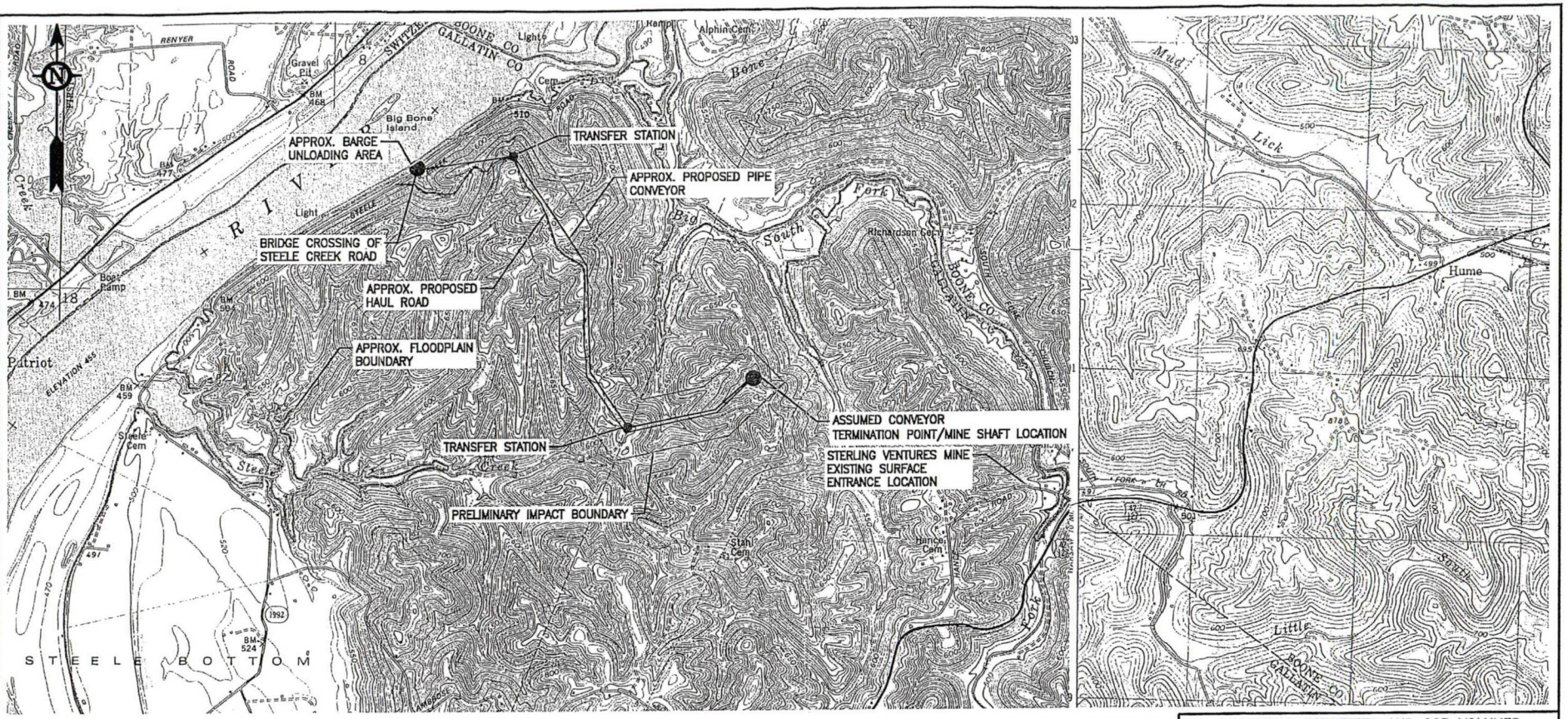
Notes:
- Drawing Not to Scale.
- Mine ceiling and floor elevations are based on average elevations across each level.
- Bentonite Seam and Rock Stratigraphy Information Resource: Kentucky Geological Survey, University of Kentucky, Lexington Series X, 1974. High Carbonate Rock in the High Bridge Group (Middle Ordovician), Boone County, Kentucky. Author: Garland R. Dever, Jr.
- Elevations are referenced at Sea Level.

REFERENCE:
INFOGRAPHIC FROM STERLING VENTURES, LLC PERMIT APPLICATION TO KY–DWM FOR REGISTERED PERMIT–BY–RULE BENEFICIAL REUSE OF SPECIAL WASTE, DATED JULY 15, 2010.

DRAWING TITLE: FIGURE SV–3 – CROSS SECTION OF UNDERGROUND MINE			
TRIMBLE COUNTY GENERATING STATION LANDFILL SUPPLEMENT TO ALTERNATIVES ANALYSIS	LOUISVILLE GAS & ELECTRIC COMPANY (LG&E) TRIMBLE COUNTY GENERATING STATION TRIMBLE COUNTY, KENTUCKY	LG&E®	gai consultants
PITTSBURGH OFFICE • 385 EAST WATERFRONT DRIVE, HOMESTEAD, PA 15120–5005			

DRAWN BY:	RJH	APPROVED BY:	KCC
CHECKED BY:	KPR	DATE:	11/26/2014
DRAWING NUMBER: SV–3			
This drawing was produced with computer aided drafting technology and is supported by electronic drawing files. Do not revise this drawing via manual drafting methods.			REVISION
SCALE: N.T.S.		SHT. NO. ___ OF ___	
GAI DRAWING FILE NO.		C100784–07–007–11–C–SV–3	

GAI CAD FILE PATH: P:\PIT\2010\C100784.07 – Plan IIb Final Design CCR\CAD\007 (Other Studies)\CAD Department\Production Drawings\Supplement to AA\C100784–07–007–11–C–SV–3.dwg PLOTTED ON: 11/26/2014 3:02 PM PLOTTED BY: Jeremy Slodowlak



REFERENCE:
TOPOGRAPHIC MAPPING FROM USGS 7.5 MINUTE QUADRANGLES, BEDFORD (1984), BETHLEHAM (1987), MADISON EAST (1994), & MADISON WEST (1980), KENTUCKY.

NOTE: IMPACT BOUNDARY INCLUDES AREA TO CONSTRUCT AND OPERATE PIPE CONVEYOR AND HAUL ROAD.

SCALE: 1" = 2000'

2000 0 2000 4000

EARTHWORK QUANTITIES AND CCR VOLUMES			
SUBGRADE EARTHWORK		CCR VOLUME	
CUT (MCY)	0	GROSS (MCY)	34.58
FILL (MCY)	0	LINER/CAP (MCY)	0.00
NET (MCY)	0	NET (MCY)	34.58

DRAWING TITLE: FIGURE SV-4 – CONCEPTUAL DESIGN

TRIMBLE COUNTY
GENERATING STATION LANDFILL
SUPPLEMENT TO ALTERNATIVES ANALYSIS

LOUISVILLE GAS & ELECTRIC COMPANY (LG&E)
TRIMBLE COUNTY GENERATING STATION
TRIMBLE COUNTY, KENTUCKY

LG&E®

gai consultants

DRAWN BY:	RJH	APPROVED BY:	KCC
CHECKED BY:	KPR	DATE:	11/26/2014
DRAWING NUMBER: SV-4			
This drawing was produced with computer aided drafting technology and is supported by electronic drawing files. Do not revise this drawing via manual drafting methods.			REVISION
SCALE: 1"=2000'	SHT. NO. ___ OF ___		
GAI DRAWING FILE NO.		C100784-07-007-11-C-SV-4	

PITTSBURGH OFFICE • 385 EAST WATERFRONT DRIVE, HOMESTEAD, PA 15120-5005

PLOTTED ON: 11/26/2014 3:07 PM PLOTTED BY: Jeremy Slodowick



Google earth

feet 2000

meters 800

FIGURE: SV-5

DATE: 11/26/2014

DESCRIPTION: STERLING VENTURES LOOKING SOUTH EAST

Phase IA Cultural Resources Literature Research for the Sterling Ventures Study Area, Gallatin County, Kentucky

Louisville Gas and Electric Company (LG&E)

Trimble County Generating Station

Supplement to Alternatives Analysis

Trimble County, Kentucky

GAI Project Number: C100784.07

October 15, 2014

Prepared for: Louisville Gas and Electric Company (LG&E)
220 West Main Street
Louisville, Kentucky 40202

Prepared by: GAI Consultants, Inc.
Pittsburgh Office
385 East Waterfront Drive
Homestead, Pennsylvania 15120-5005

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1.0 Introduction

This report documents the results of Phase IA literature research conducted for Louisville Gas & Electric Company (LG&E) for the Trimble County Generating Station (TC Station) Supplement to Alternatives Analysis. Included in this research was an area approximated for the use of a barge unloading facility, pipe conveyor and haul roads/access roads to an existing underground limestone mine. Under this alternative, the mine would be used for Coal Combustion Residual (CCR) disposal. Existing conceptual layout plans indicate necessary work areas. A slightly larger study area was used for the Phase IA background research, due to uncertainty in the actual footprint/disturbance of the work areas. The Sterling Ventures Study Area is located approximately 40 miles northeast of the current Trimble County Generating Facility in Gallatin County, Kentucky (Figure 1).

GAI Consultants, Inc. (GAI) conducted Phase IA cultural resources literature research of the Study Area (approximately 1,400 acres) in September 2014 to determine the presence of previously recorded archaeological sites and architectural and historical resources and to assess the potential for unrecorded archaeological sites, architectural/historical resources, and cemeteries. The previously recorded archaeological resources information was obtained through the Kentucky Office of State Archaeology (OSA) (received September 23, 2014), while the Kentucky Heritage Council (KHC) provided information on recorded historic resources on September 12, 2014. The results of the Phase IA literature research for the cultural resources are provided below.

2.0 Study Area

2.1 Location

The Study Area is located near the northern limits of Gallatin County at approximately Ohio River Mile 517. It is generally bounded by the Ohio River to the west, ridge sideslopes and Big South Fork to the north, and ridge sideslopes to the east and south. Big South Fork marks the boundary between Gallatin and Boone County. The Ohio River marks the boundary between Gallatin County, Kentucky and Switzerland County, Indiana.

2.2 Description

The Study Area includes both bottomland and upland settings (see Figure 1). Bottomland (floodplain and terrace) settings are located on the northwest edge of the study area along the Ohio River. Soils in these bottomland settings fall primarily within the Wheeling-Huntington Alluvial land soil association. This soil association consists of nearly level to steep soils located on floodplains and terraces. The floodplain and terraces, located along the Ohio River, are narrow with hillsides hugging the terrace edge.

The remainder of the Study Area is located in highly dissected uplands and includes narrow bottomlands and ravines, narrow ridgetops, and ridge side slopes. Soils within these upland settings fall primarily within the Eden soil association, which is characterized by moderately steep to strongly sloping upland soils with underlying clayey subsoil. These soils are underlain by calcareous shale interbedded with limestone and siltstone. A large portion of the upland soils are classified as Eden flaggy silt clay, 20 to 30 percent slopes, and severely eroded soils. These soils are typically found on sideslopes with a parent material of clayey residuum weathered from calcareous limestone and shale.

Uplands locations are dissected by several stream drainage valleys and ravines including Big South Fork, unnamed tributaries of Big South Fork, two unnamed tributaries of the Ohio River, Steele Creek, and unnamed tributaries of Steele Creek. Elevation varies from approximately 455 (Ohio River elevation) to 840 Above Mean Sea Level (AMSL) (along the ridgetops) (see Figure 1).

There are very few roads (paved or unpaved) running through the Study Area. Steele Creek Road/Steeles Bottom Road/Rt. 1992 runs southwest-northeast along a narrow terrace of the Ohio

River; along the northwest edge of the Study Area, Steele Creek Road curves to the southeast, running along the south side of Big South Fork and then curves southward into the northeast side of the Study Area. South Fork Road runs along the south side of Big South Fork outside the northeast end of the Study Area. South Fork Road Intersects with Nicholas Ridge Road at Big South Fork. Nicholas Ridge Road runs just outside the northeast end of the Study Area. Hance Road and Sierra Drive are located near but outside of the southeastern corner of the Study Area.

An unpaved road loops from the northwest end of the Study Area off of Steele Creek Road, traversing northeast, and then turning to the southeast along the ridgetop before turning northward to connect to the southeast end of Rt. 1992 near Big South Fork. Another unpaved road runs from S.R. 1992 to the northeast, crossing Steele Creek three times before entering the Study Area. One outbuilding is shown next to this unpaved road on a ridgetop near the south end of the Study Area. Then, this unpaved road turns into a trail and runs northward, crosses the Study Area and leading to two outbuildings near Big South Fork within the Study Area.

There are also the ends of two unpaved roads on the east end of the study area. One of these crosses the Boone/Gallatin County Line travelling in a general westerly direction on the south side of Big South Fork before terminating just inside the Study Area. Another unpaved road runs from Hance Road to the northwest and crosses into the south side of the Study Area.

There are very few structures within the Study Area (see Figure 1). A few buildings are located along Steele Creek Road along the Ohio River; however, these appear to be just outside of the Study Area. There is a dwelling and outbuilding at the terminus of Steele Creek Road near Big South Fork. There is also a dwelling and two outbuildings along the trail.

Three utility line corridors run through the Study Area (Figure 2). A pipeline runs in a northeast-southwest direction crossing near the center of the Study Area. A transmission line crosses on the eastern end of the Study Area. A shorter, service transmission line runs from this utility line to an industrial complex (Sterling Ventures Mine) outside of the southeast end of the Study Area.

Two large man-made lakes are located within the Study Area between Sterling Ventures Mine and the main transmission line. Service roads are located between the mine area and these lakes. Two other lakes are shown on ridgetop settings within the Study Area (see Figures 1 and 2).

2.3 Previously Recorded Cultural Resources

A review of KHC and OSA data for historical and architectural resources and archaeological sites indicate that there are no previously recorded archaeological or architectural/historic resources within the Study Area. Due to viewshed concerns, the immediate area was also examined for potential historical/architectural resources. There are six recorded resources in proximity to the Study Area and several others recorded in the general area (Figure 3). KHC provided preliminary information for the six closest recorded resources, all of which were located in Boone County (Table 1).

Table 1. Nearby Recorded Architectural/Historical Resources.

ID #	Resource Name / Type	Street Location	National Register of Historic Places Status
BE 248	South Fork Christian Church/Church	14868 South Fork Church Road	Undetermined
BE 734	- / House	14909 South Fork Church Road	Undetermined
BE 735	- / House	14888 South Fork Church Road	Undetermined
BE 726	- / House	14589 South Fork Church Road	Undetermined
BE 737	- / Peace Barn	15419 South Fork Church Road	Undetermined
BE 1106	- / Mail Pouch Barn	15112 South Fork Church Road past US 42	Undetermined

2.4 Cemeteries

Seven cemeteries located outside of the Study Area were identified including an unnamed cemetery, Alphin Cemetery (Boone County), Richardson Cemetery (Boone County), South Fork Church Cemetery (Boone County), Hance Cemetery, Stahl Cemetery, and Steele Cemetery. No mapped cemeteries are located within the Study Area (Figure 4). Information on number of interments and the death date ranges for four of these cemeteries was obtained from the website, www.findagrave.com. The largest of these, the Hance Cemetery includes 189 interments dating from 1890s to 2000s. The South Fork Church Cemetery (Boone County) was recorded as having 32 interments dating from the 1850s to 1910s. The Alphin Cemetery (Boone County) was documented as having 12 interments dating from the 1820s to 1890s. The last cemetery with available information was the Richardson Cemetery (Boone County), which was recorded as having 9 interments that fall within the range of 1850s to 1920s.

2.5 Map Research Results

The earliest map consulted was a map of Virginia (western part, i.e., Kentucky) printed in 1784 and located on the http://historicalcharts.noaa.gov/ website. The map depicted roads, forts, settlements, houses, mills, and wigwams. The only mapped features mapped in the immediate study area vicinity were two salt /medicinal springs on the south side of Big Bone Creek and possibly a road running north-south (labelled as Gen'l Clark's War Road) and crossing just east of the confluence of Mud Lick Creek with Big South Fork. No towns, houses or mills were mapped in Gallatin County.

The only detailed nineteenth century map identified for the Sterling Ventures Study Area was Griffing's (1883) map of Napoleon Precinct No. 3 in the *Atlas of Carroll and Gallatin Counties, Kentucky*. This map depicts the locations of houses and the names of the house owners. Approximately 11 houses are depicted within or in proximity to the Study Area (Figure 5). House locations on nineteenth century atlas maps are not accurate by current standards but do indicate general areas that have the potential to contain historic era archaeological sites.

Two mid-twentieth century general highway maps produced by the Kentucky Department of Transportation (1942, 1953) depict five house locations in the same positions within the Study Area (Figure 6, top). The USGS quadrangle map of Patriot, IN/KY (1951) shows outbuildings, such as barns, that were lacking on the highway maps (Figure 6, bottom). There appeared to be few changes within the Study Area from the mid-twentieth century to the present. These historic maps suggest that there is a potential for unrecorded archaeological sites and architectural resources over 50 years of age within the Study Area.

3.0 Summary

Based on the results of the Phase IA Cultural Resources desktop research, there are no previously recorded archaeological sites or architectural/historical resources within the Sterling Ventures Study Area. There are also no mapped cemeteries within the Study Area. Map research does indicate that there are likely unrecorded historic archaeological sites and architectural resources within the Study Area. There is also a moderate to high potential for prehistoric sites.

4.0 References Consulted

Griffing, B.N.
1883 Atlas of Carroll and Gallatin Counties, Kentucky. Published by D.J. Lake & Co., Philadelphia

Filson, John
1784 Virginia (Western Part, i.e. Kentucky) at the time of Ratification of the Constitution, from 1784 and 1789 Maps in the Library of Congress at Washington, T. Rook Philadelphia. Reprinted in

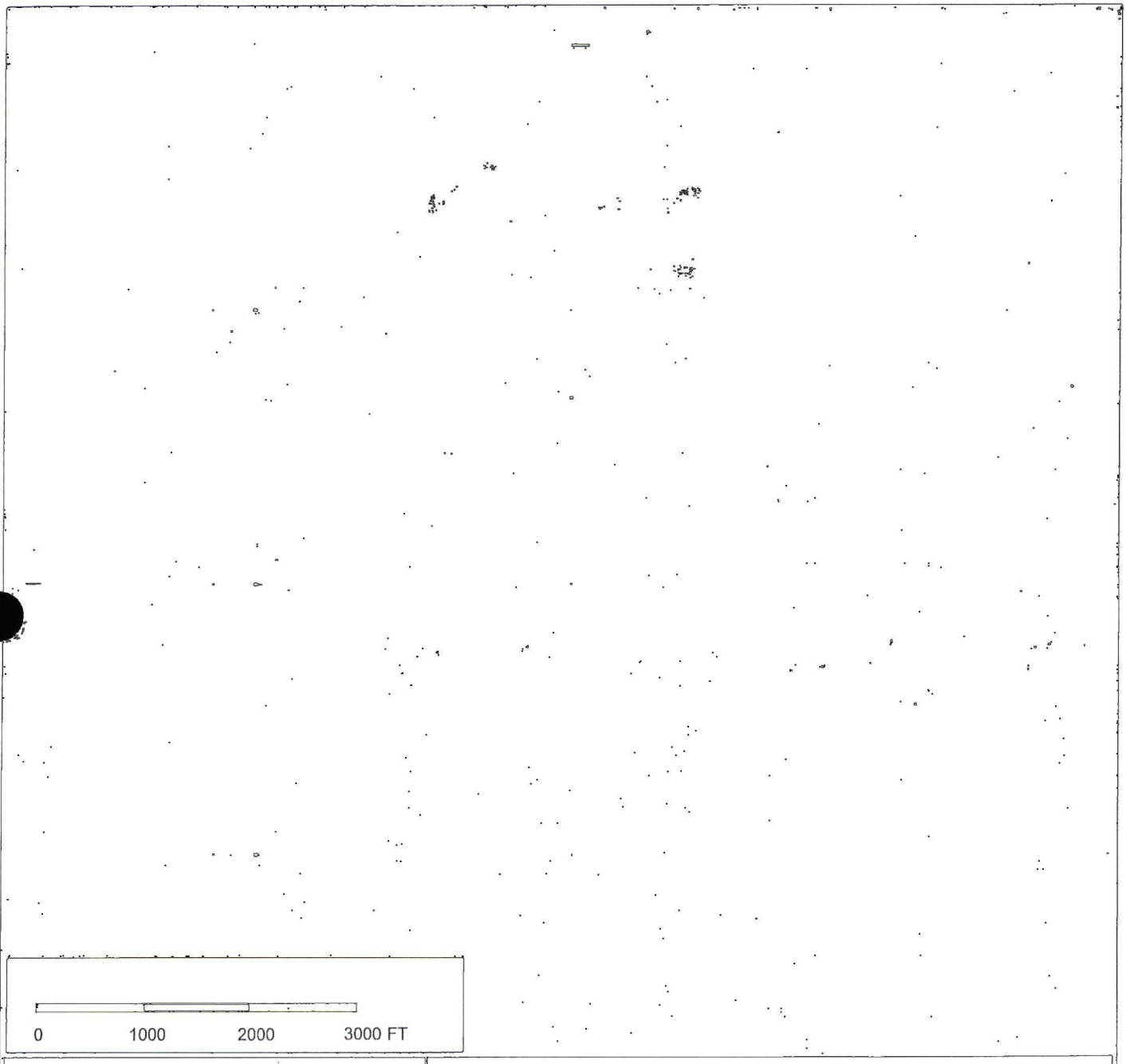
1937 by the U.S. Geological Survey. On file at National Oceanic and Atmospheric Administration Historical Map Archive.

Kentucky Department of Transportation
1942 General Highway Map, Gallatin County, Kentucky.
1953 General Highway Map, Gallatin County, Kentucky.

United States Geological Survey
1951 Patriot, IN/KY Quadrangle Map
1961 Patriot, IN/KY Quadrangle Map
1969 Patriot, IN/KY Quadrangle Map
1981 Patriot, IN/KY Quadrangle Map
1994 Patriot, IN/KY Quadrangle Map
1981 Varona, KY Quadrangle Map

Weisenberger, B.C. and A. J. Richardson
1985 *Soil Survey of Carroll, Gallatin, and Owen Counties, Kentucky*. US Department of Agriculture, Soil Conservation Service.

FIGURES



0 1000 2000 3000 FT

SOURCE: USGS TOPOGRAPHIC MAPS OF PATRIOT WEST, IN/KY (REV. 1994) AND VARONA, KY (REV. 1981)

FIGURE 1. STERLING VENTURES STUDY AREA

Legend

PHASE IA STUDY AREA

gai consultants

SUPPLEMENT TO ALTERNATIVES ANALYSIS
TRIMBLE COUNTY GENERATING STATION

DRAWN: LAF CHECKED: KR APPROVED: KR DATE: 9/29/14



SOURCE: BING MAPS AERIAL PHOTOGRAPH (ACCESSED SEPTEMBER 23, 2014)

FIGURE 2. AERIAL VIEW OF STERLING VENTURES STUDY AREA

Legend

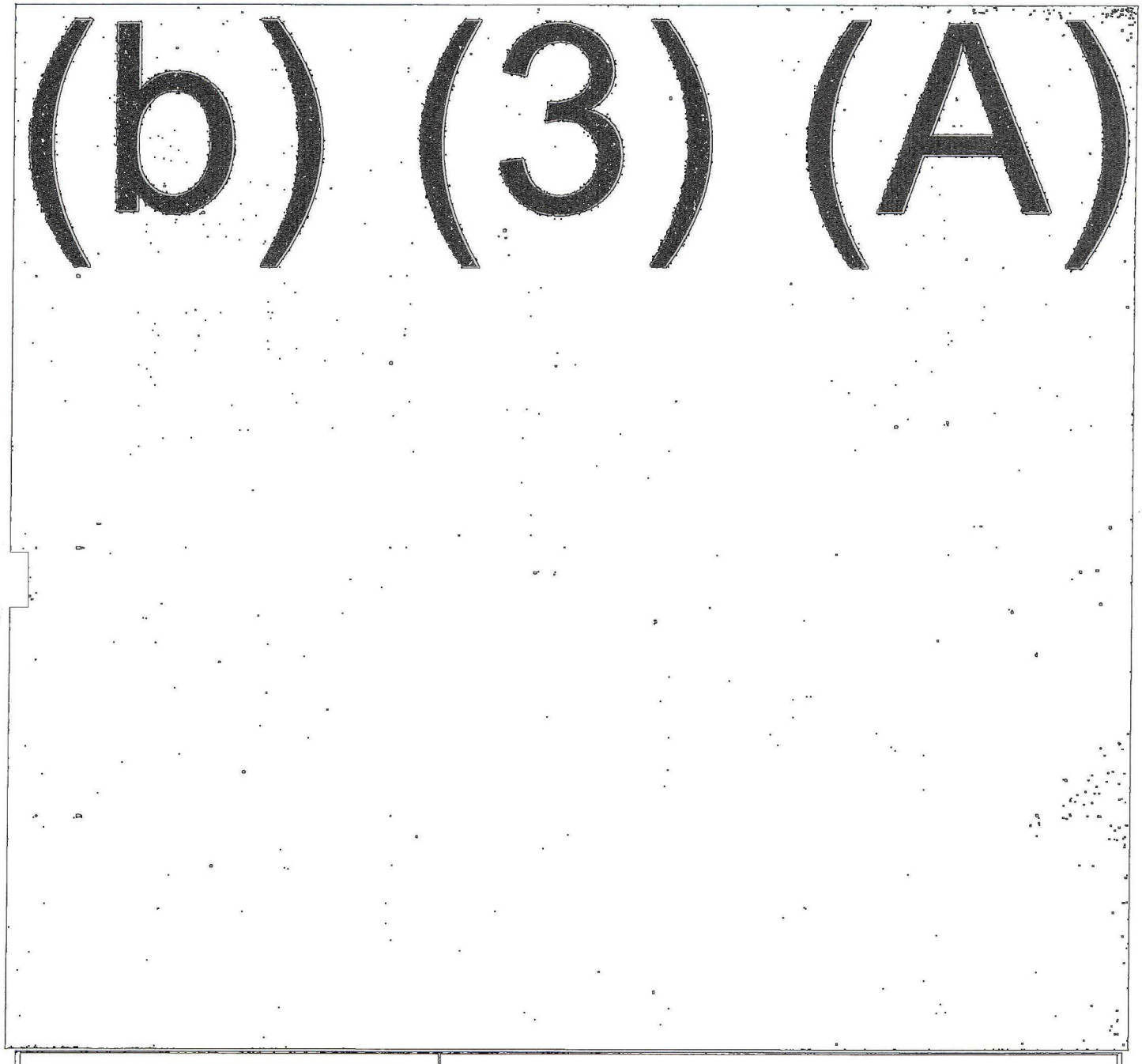
STUDY AREA

gai consultants

SUPPLEMENT TO ALTERNATIVES ANALYSIS
TRIMBLE COUNTY GENERATING STATION

DRAWN: LAF CHECKED: KR APPROVED: KR DATE: 9/29/14

(b) (3) (A)



SOURCE: USGS TOPOGRAPHIC MAPS OF PATRIOT WEST, IN/KY (REV. 1994) AND VARONA, KY (REV. 1981)

FIGURE 3. PREVIOUSLY RECORDED ARCHITECTURAL/HISTORICAL RESOURCES IN STERLING VENTURES STUDY AREA VICINITY

Legend

STUDY AREA

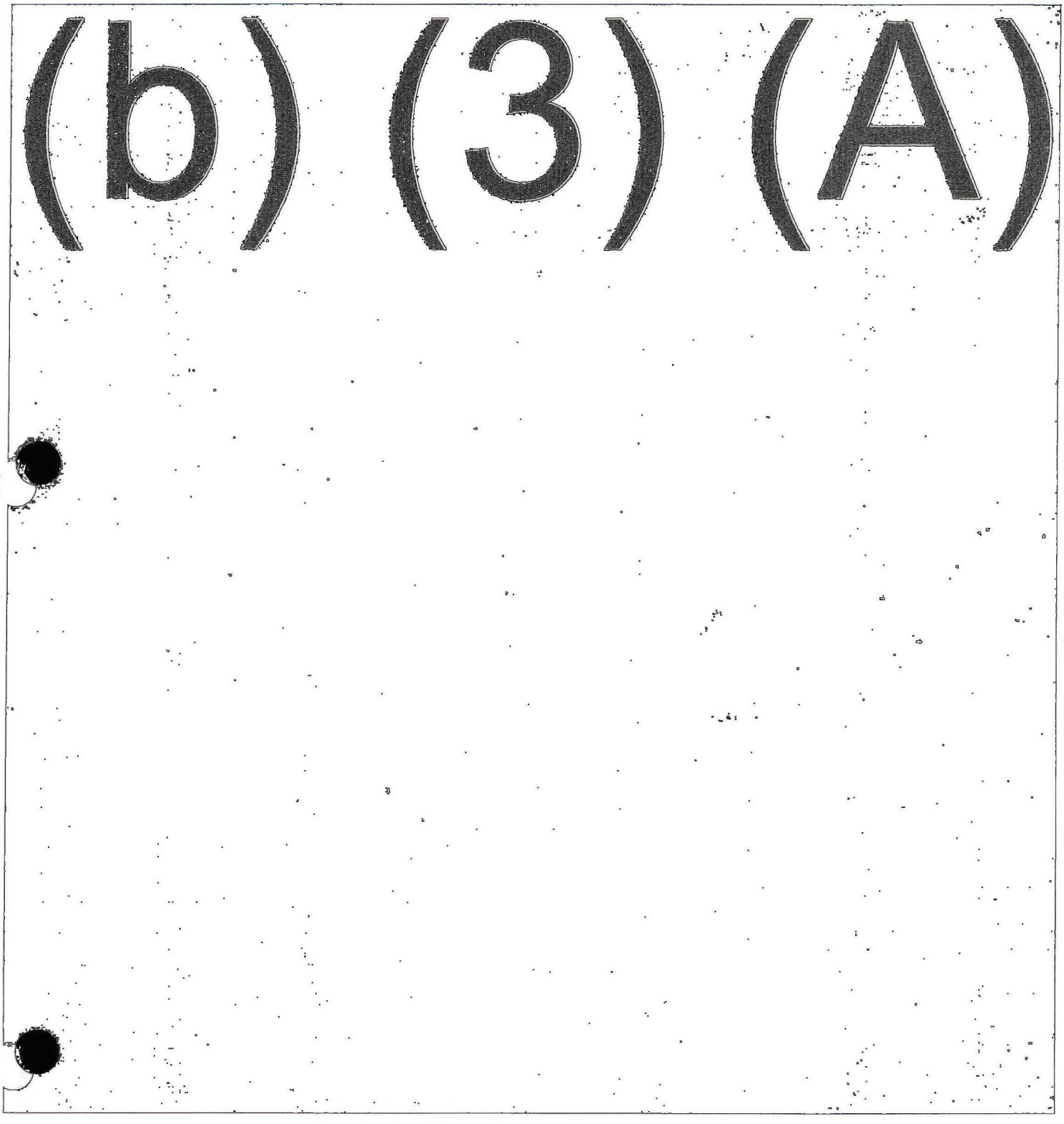
PREVIOUSLY RECORDED HISTORICAL / ARCHITECTURAL RESOURCE

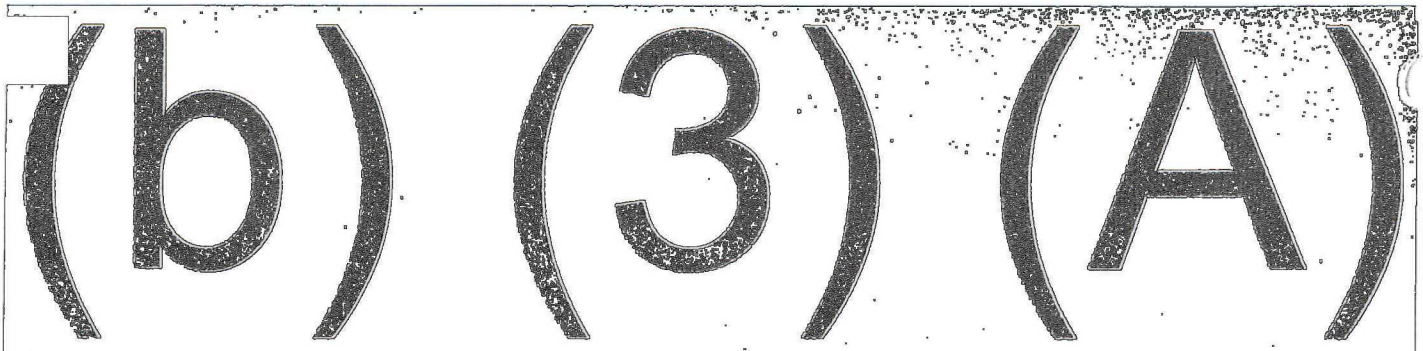
gai consultants

SUPPLEMENT TO ALTERNATIVES ANALYSIS
TRIMBLE COUNTY GENERATING STATION

DRAWN: LAF CHECKED: KR APPROVED: KR DATE: 9/29/14

(b) (3) (A)


(b) (3) (A)


(b) (3) (A)

ATTACHMENT

Response from Sterling Ventures, LLC to LG&E concerning CCR placement in Sterling Ventures Mine

Responses to LG&E

1. *Identify the disposal fee proposed by Sterling assuming delivery of CCR to the proposed mine shaft at the Sterling Ventures site (including any fee escalator over the 37 year life).*

$10.15 per ton, based upon staging the product on site, then transporting into the mine by off-road haul trucks (see answer to question 2 below),with potential adjustments up or down based upon answers to the following:

a. Will the product be a blend of gypsum, fly ash and bottom ash, or will the products be delivered separately?

b. What will be the moisture content of the delivered product(s)?

c. Will any product(s) be delivered pneumatically?

d. What is the proposed delivery schedule?

   i. How many days per week?

   ii. How many hours per day?

   iii. How many tons per day (based on your requirement of 33.4 million cubic yards over 27 years are, are we correct in assuming approximately 900,000 cubic yards per year)?

   iv. What are the density assumptions for the delivered product(s) (ton/CY)?

As the cost factors associated with moving the CCPs to and around the proposed landfill are similar to Sterling's operational cost factors, Sterling would be agreeable to the O&M escalator LG&E is assuming when calculating the comparative PVRR for the alternatives analysis between utilizing Sterling's mine or the proposed Trimble landfill.

Our goal is that, based upon the comparative PVRR analysis of the mine verses landfill options, Sterling will be, at a minimum, a $10,000,000 PVRR lower cost alternative, without considering the considerable additional cost savings that would be generated from backhauling or barging our high calcium scrubber stone to either Ghent or Trimble County. We would work diligently with you to achieve that comparative PVRR savings.

Obviously, the comparative PVRR analysis will require consideration of transportation cost. As you did not ask about transportation cost, I assume you have, based upon the trucking logistics as outlined above, already have a bid for those costs in order to do the comparative PVRR analysis. If appropriate, Sterling would also like to be considered to provide trucking services.

2. *Describe proposed methods for receiving delivery of CCR by barge or truck.*

The method of receiving delivery by truck will depend in large part based upon answers to the above questions, plus a review of the TCLP analysis of the delivered products(s). For example, gypsum, if delivered separately, may require less onsite infrastructure than fly ash or bottom ash. The moisture content of the product will also affect the delivery method.

Depending on the above, the options are (i) dumping the product(s) at a staging area onsite prior to being hauled into the mine by articulated truck, (ii) dumping directly into a mine shaft specifically designed for the CCP placement, or (iii) pneumatically pumping through a pipe into the mine. Note that utilizing options (ii) and (iii) above would require capital expenditures by Sterling, but could reduce the cost per ton of placing the CCPs in the mine.

Delivery by barge will require the construction of a barge off-loading facility near Sterling's mine, which is located a little over a mile from the river. Depending upon the design of the barge facility, the CCP's could be (i) staged next to the barge facility then trucked into the mine, or (ii) conveyed directly into the mine. Barging the CCPs to Sterling's mine, especially when combined with back barging of limestone, we believe could generate enormous PVRR cost savings compared to the proposed landfill.

3. *Identify the disposal capacity available in the mine as of this date and specify if disposal capacity is only available in the uppermost seam/mining level.*

Sterling could utilize the all levels of the mine for the CCP placement. Sterling estimates that as of this date, there is enough existing space in the mine for at least 5,000,000 cubic yards of CCPs.

4. *Identify the projected range in the mining rate over the 37 year term of any potential agreement with LG&E, explain the basis for the estimated rates, and provide the actual mining rate over the past three years for the seam where disposal will occur*;

Sterling current mines between 900,000 and 1,500,000 tons of aggregate per year, depending on market conditions. In the event, LG&E purchased Sterling's high calcium limestone, the number would increase accordingly. Production tonnage for the last three years are as follows:

2011	1,451,671
2012	933,694
2013	1,181,745

5. Advise whether CCR material would be conveyed to a current or new mine shaft and provide the specific locations of such mine shaft(s) and specify whether the disposal fee includes Sterling Ventures paying for and installing all required shafts.

Using a mine shaft as access to the mine could decrease the above price by as much as $1 per ton. If a mine shaft is utilized, an older existing air shaft located immediately across from Sterling's mine office would be modified and utilized. Whether the cost of such a shaft is included in the price depends upon the guaranteed time commitment of LG&E. Your email indicates that you want a guaranteed obligation to make the mine available for 37 years. If your contractual time obligation is reciprocal, all capital cost would be included in the quoted price.

6. *Identify commitments proposed by Sterling to ensure that CCR from the Trimble County Station are not co-mingled with wastes or materials from other sources.*

Sterling will commit that the Trimble County CCPs would be segregated from other wastes.

7. Advise whether the mine is dry and identify measures taken to keep it dry; advise if water collects in the mine and identify measures taken to handle the water (including volumes of water pumped).

The mine is essentially dry in that water does not migrate into the mine through the limestone. Water is required in mining operations for dust control. Water from the surface flowing down the access slope is collected and used for dust control. In addition, water from surface ponds is periodically pumped into the mine as to supplement water collected at the bottom of the access slope.

8. Describe any groundwater monitoring wells for the site and provide general information for each well (e.g., location, depth, quality).

Attached is the Form 7059F filed in connection with obtaining the current Permit to receive gypsum from Ghent. The document describes the location of the mine levels to groundwater. The CCPs would be placed at a minimum of 200 feet below the deepest recorded well in the area, and below two bentonite seams. Surface groundwater monitoring wells would serve no function in this situation.

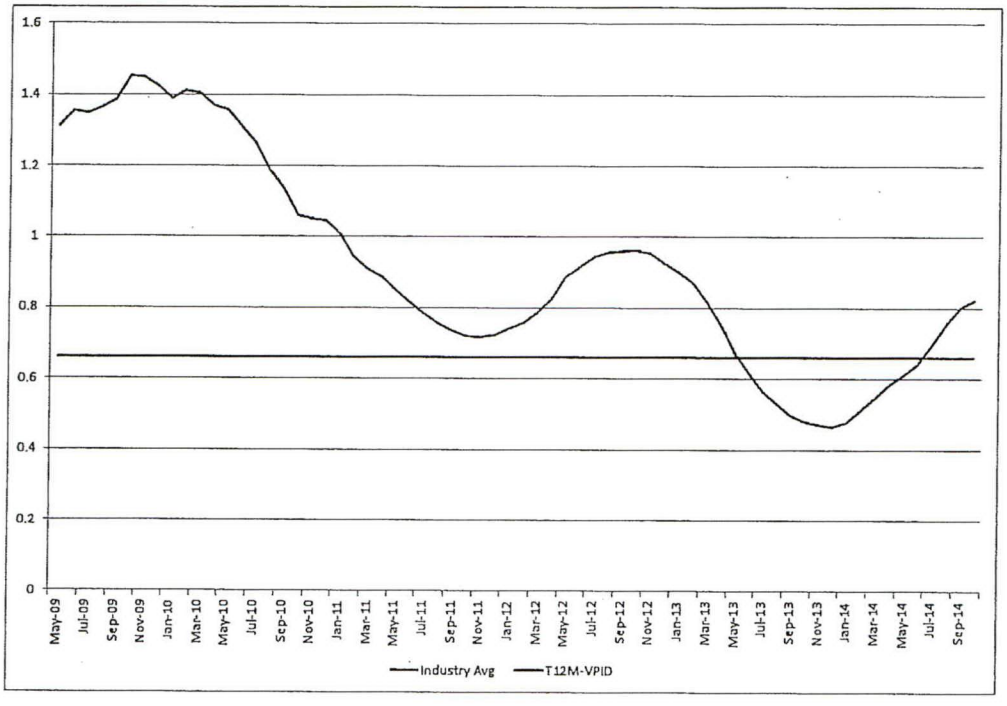
9. *Provide any environmental studies or evaluations regarding the mine including those already performed for the current permit and those for addressing and obtaining any additional necessary permitting approvals for disposal of CCR products listed above.*

See attached form 7059. Amending the current Permit to allow the CCPs to be placed in the mine will require submitting at a minimum TCLP analysis of the product and summary of the disposal method the parties agree to. Informal discussions with Ky. Division of Solid waste indicate that amending the Permit to allow for Trimble County's CCPs should not be a difficult process given the mine geology and current permit. We believe also worth considering as an

alternative in the comparative PVRR analysis is transporting Trimble Count's bottom ash and fly ash to the new Ghent landfill, and its gypsum to Sterling, in order to fully take advantage of Sterling's existing Permit without modification.

10. *Provide complete safety statistics for the Sterling Ventures facility for the most recent three years.*

The most accurate safety statistic is Sterling's violation per inspection day (VPID) as calculated by the Mine Safety and Health Administration (MSHA) as compared to the industry average for underground metal/non-metal mines. The following is a chart detailing Sterling's trailing 12 month VPID as compared to industry average for the past three years. As of September 2014, Sterling's 12 month trailing VPID is .8 violations per eight hour inspection day.



11. *Provide the most recent third-party audited financials for Sterling Ventures.*

Sterling is not willing to provide confidential business information in connection with quoting pricing for services.

12. *Describe the financial assurance Sterling Venture will provide to guarantee performance over the full expected life of the contract.*

Sterling is agreeable to providing reasonable financial assurances based upon a fair and equal allocation of risk between the parties, and reciprocal performance assurances by LG&E for utilization of the mine as contemplated above.

ATTACHMENT

MSHA Mine Overview Research – Sterling Ventures Mine

Mine Data Retrieval System
as developed by PEIR

Mine Overview

Current Mine Information

Mine ID:	**1518068**
Operator:	**Sterling Materials**
Opr. Begin Date:	**7/1/1998**
Mine Name:	**Sterling Materials**
Current Controller:	**Boone Trust, Samuel A.B. (Alex) Boone Trustee**
Controller Start Date:	**7/1/1998**
Mine Status:	Active
Status Date:	7/30/2012
Mined Material:	Crushed, Broken Limestone NEC
Type of Mine:	Underground
Location:	Gallatin County, KY
State:	KY

Operator History for Mine ID: **1518068**

Operator Name	Begin Date	End Date
Sterling Materials	7/1/1998	

How do I use this information? *Click Here*

PLEASE NOTE: The information provided by the Mine Data Retrieval System (MDRS) is based on data gathered from various MSHA systems. As there may be a lag time in data being entered into those systems, there will also be a lag in the reflection of that data on the MDRS.

Injuries, Hours Worked, and Production Totals

The current operator Sterling Materials has been the operator since 7/1/1998

Year	Fatal Operator Injuries	NFDL Operator Injuries	Fatal Contractor Injuries	NFDL Contractor Injuries	Operator Hours Worked*	Operator Fatal Incidence Rate**	Operator NFDL Incidence Rate**	Mine Type National Fatal Incidence Rate**	Mine Type National NFDL Incidence Rate**
2003	0	0	0	0	113,020	0.00	0.00	0.0480	2.42
2004	0	2	0	0	118,411	0.00	3.38	0.0000	2.64
2005	0	0	0	0	102,903	0.00	0.00	0.0882	2.18
2006	0	1	0	0	99,321	0.00	2.01	0.0215	2.11
2007	0	0	0	0	111,952	0.00	0.00	0.0000	1.77
2008	0	2	0	0	128,157	0.00	3.12	0.0448	1.68

2009	1	0	0	0	103,032	1.94	0.00	0.0251	1.91
2010	0	1	0	0	102,936	0.00	1.94	0.0246	2.09
2011	0	1	0	0	116,837	0.00	1.71	0.0235	1.69
2012	1	5	0	0	104,990	1.90	9.52	0.0462	1.64
2013	0	2	0	0	115,253	0.00	3.47	0.0000	1.59
2014	0	0	0	0	87,924	0.00	0.00	0.0823	1.52

* Hours worked and accidents & injuries now include office hours or accidents (subunit 99).

** Current rates are based on data available as of **2014 Quarter 2**. For a further explanation, please see this.

Citations, Orders, and Safeguards

The current operator Sterling Materials has been the operator since 7/1/1998

Year	103(k)	104(a)	104(b)	104(d)(1)	104(d)(2)	104(g)(1)	107(a)	Proposed Penalties ($)	Current Penalties ($)	Amount Paid To Date ($)
2003	0	34	0	0	0	0	0	5,105.00	5,105.00	5,105.00
2004	0	59	0	1	0	0	0	8,770.00	8,770.00	8,770.00
2005	0	23	0	0	0	0	0	3,371.00	3,371.00	3,371.00
2006	0	30	0	0	0	0	1	4,642.00	4,642.00	4,642.00
2007	0	38	0	0	0	0	0	8,305.00	8,305.00	8,305.00
2008	1	56	0	0	0	1	0	34,382.00	29,607.00	29,607.00
2009	0	63	0	1	0	1	0	100,236.00	77,328.00	77,328.00
2010	0	48	0	0	0	0	0	23,743.00	16,543.00	16,543.00
2011	1	37	0	0	0	0	0	7,706.00	7,706.00	7,706.00
2012	2	53	1	5	23	4	0	432,504.00	431,517.00	7,343.00
2013	0	30	0	0	0	0	1	8,968.00	8,968.00	8,968.00
2014	0	26	0	0	0	0	0	8,061.00	8,061.00	3,239.46

Note: Vacated Citations are not included in any reports on the MDRS.

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APPENDIX III.C-1. METHODS FOR EVALUATION OF LOGISTICS

1. INTRODUCTION

Pursuant to 40 CFR 230.10(a)(2), an alternative is deemed practicable if it is "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." The assessment of "logistics" addresses the physical, regulatory, management or other tangible factors that may bear upon the practicality of implementing a complex project such as a Coal Combustion Residual (CCR) disposal facility.

Logistical factors may rise to the point that an alternative is determined to be not practicable, as when the existing topography at a site will not physically accommodate a properly built CCR disposal facility, unworkable operational constraints are created, or unacceptable safety hazards are present. In other cases, logistical factors may add complications that bear on the schedule, cost and impact of the project, which in turn may influence whether an alternative is practicable.

For a public utility such as LG&E, a particularly important consideration is the need to avoid potentially significant risks to safe and efficient generation of electricity that could result from the failure to assure proper long-term management of CCRs.

2. APPROACH TO LOGISTICAL EVALUATIONS

In the prior January 2014 Alternatives Analysis Report (GAI, 2014, see Support Document 1A), LG&E and its consultant GAI evaluated many different logistical factors for each identified alternative. This Appendix III.C-1 identifies the factors and discusses the methods used to evaluate each. The results of the evaluations are presented in other parts of this Supplement and are essentially unchanged from those in the prior report, though for Lee Bottom Landfill and Valley View Municipal Solid Waste (MSW) Landfill, there is more detail in this Supplement.

The past and present approach to evaluating logistical issues is a stepped and iterative approach, which is presented here as follows.

- All evaluations begin with a common assumption about the volume of CCR that must be managed, and consequent area needed to accommodate the landfill footprint. The basis for this volume and area estimate is provided in Section 3 of this Appendix. Sites with insufficient volume individually were aggregated together in various combinations that collectively would have adequate volume to accommodate the required CCR disposal volume.
- To evaluate any alternative, an extensive effort is required to conceptually design the prospective project. This involves a combination of professional judgment assisted by computer software. It includes evaluating the site topography or landscape to identify a logical location for the landfill and associated support facilities (transportation, runoff and sediment management, leachate collection and treatment, soil borrow areas). It further involves determination of appropriate facility dimensions, earth movement requirements, and other attributes of these project

components. This conceptual design is the basis for other evaluations, including the estimation of costs and prediction of approximate environmental impacts. In addition, the conceptual design is used to confirm the availability of sufficient capacity at a potential site or group of sites. The procedures for preparing a conceptual design of a CCR landfill are outlined in Section 4.

- Additional steps in the logistical evaluation involve identification of site-specific conditions that could impact design, costs or schedules. These additional factors are discussed as follows: 100-year floodplain (Section 5); cemeteries (Section 6); wetlands and streams (Section 7); karst features (Section 8); other project features (Section 9); land access and acquisition (Section 10); permitting (Section 11), and risks (Section 12). In some cases consideration of these factors could result in modifications to the conceptual design (e.g., to avoid certain site features), hence the conceptual design is an iterative process.

3. VOLUME REQUIREMENT

The nominal volume of CCR that requires storage has been estimated at 910,000 cubic yards per year, which totals 33.4 million cubic yards over the nearly 37 years between landfill start-up (beginning of 2018) and the lifetime for TC Station assumed for planning purposes. (approximately 2055). The volume is dominated by gypsum (53%) and fly ash (38%). The other primary component is bottom ash (7%); there are minor amounts of economizer/duct ash and pyrites.

This value is approximate and subject to variation over time. The volume reflects knowledge of current rates of CCR generation at TC Station. Based on experience, the size of a landfill footprint required to provide this capacity is on the order of 200 acres if only one site is used. For multiple sites, the cumulative acreage is greater.

As discussed further below, for purposes of this analysis, in GAI (2014) LG&E also had assessed alternatives using a storage volume of 640,000 cubic yards per year (23.4 mcy total) based on speculative assumptions about beneficial reuse of CCR.

Minimization of waste volume through pre-treatment. Current CCR disposal at TC Station is "wet", and involves slurry to ponds. For any new CCR facility, the CCR generated at the station will be subject to dewatering and conditioning and will be considered "dry".

Moisture content of the CCR will be reduced from 100% in the wet form, to 10-20% for dry disposal. This change will benefit any CCR disposal alternative due to the ability to place the CCR material in a dry landfill that can be stacked in elevation, as opposed to storage in an ash pond. In the specific case of LG&E's proposed action, the plan to convert material from 'wet' to 'dry' has allowed LG&E to modify its initial CCR disposal facility design so as to avoid any disposal in Ravine A and substantially reduce the landfill footprint in Ravine B.

Overview of beneficial reuse issues. GAI (2014) assessed CCR disposal facility Site Alternatives using both the 910,000 cubic yards/year value, and a reduction of that value by 30% through assumed beneficial reuse of CCR materials. The lower value was used in response to a concern by EPA that LG&E had failed

to account for beneficial reuse of CCR and had eliminated otherwise viable alternatives because they did not have capacity to accommodate 100% of the anticipated CCR volume (estimated at 34.6 mcy in the earlier report). The discussion below addresses three aspects of beneficial reuse:

- difficulty in obtaining an assured estimate of how much beneficial reuse will occur;
- an arbitrary and aggressive assumption of 30% beneficial reuse;
- LG&E's preferred benefit from beneficial reuse.

Assured estimate of beneficial reuse volume. It is difficult to determine how much if any volume reduction will be achieved in the future through beneficial reuse of CCR. Issues with beneficial reuse include the following.

- Under current conditions, there is no assurance of a future market for TC Station CCR. The site is relatively remote from potential markets and must compete with the growing supply of CCR being produced elsewhere in response to regulatory controls. Today, TC Station's few off-site customers are "sold" CCR for the cost of transport only.
- Historically the highest sustained rate of beneficial reuse of CCR materials has been about 30% of the total CCR volume. Designing a CCR disposal facility based on assuming substantial beneficial reuse has minimal economic benefits, and imposes substantial operational risk if a particular assumed beneficial reuse rate is not achieved and the landfill design proves inadequate.
- Decisions about whether an alternative is practicable cannot be based on speculation and must be based on current conditions, which do not support an assumption of any assured level of future beneficial reuse.
- While not likely, if the EPA ruling on treatment of CCR material deems CCR to be hazardous waste, the beneficial reuse markup would be all but eliminated. Additionally, the proposed regulations may impact CCR use in large structural fill projects, which could affect the beneficial reuse market as well.
- Current and future air pollution control systems designed to reduce air emissions could further change the characteristics of CCR material, making the product less desireable for use in beneficial reuse projects.

Arbitrary and aggressive assumption of 30% beneficial reuse. Despite the uncertainty about the assured level of future beneficial reuse, GAI (2014) assessed site capacity of various potential landfill sites under the assumption that a volume reduction of 30% could be sustained indefinitely. Thus sites were not considered impracticable on the basis of capacity alone if they had capacity for at least 23.4 mcy. Further, sites with even less capacity were still considered in combination with other sites. The same approach is used in this Supplement.

LG&E's preferred benefit from beneficial reuse. Operation of the TC Station may extend past 2055. For example, a recent study by the Kentucky Energy and Environment Cabinet indicates that if the plant is retrofitted to provide carbon capture and sequestration, TC Station Generating Unit #2 will be the "last plant standing" among Kentucky's coal-fired generating units, with a life expectancy to 2070 (if not beyond). With the same retrofit, Unit #1 is projected to operate until 2066. These estimates are documented in Table B.1 of the Cabinet report which can be found at:

http://eec.ky.gov/Documents/Economic%20Challenges%20Report%20FINAL%20with%20letter%2012-18b-13.pdf

For its own planning, LG&E considers that any volume reduction achieved through beneficial reuse of CCR will mean that in 2055 the landfill would not have filled to capacity. This would have the practical benefit of extending the lifetime of the CCR landfill, at whatever location it may occur. Ideally the volume reduction from beneficial reuse and the extended landfill lifetime would obviate the need for any additional landfill site ever being needed for TC Station.

4. CONCEPTUAL DESIGN

The CCR landfill options considered by LG&E fall into two categories: conventional and non-conventional. The latter are alternatives that do not require actual construction of a dedicated CCR landfill, such as disposal in an existing underground mine or permitted municipal landfill. For such alternatives, the disposal design does not follow a standard format but must be tailored to the site.

For conventional options, where a new landfill would be constructed, a conceptual design is needed to evaluate logistical issues, estimate project costs, and identify potential impacts. Elements of such designs include: the landfill proper; the transportation system; and support facilities such as borrow areas, leachate treatment, and runoff and sediment controls. The conceptual design process needs to be relatively simple to allow for analysis of a large number of alternatives in a reasonable amount of time, and consistently applied to all alternatives. The process often is iterative, with modifications to the original concept occurring in response to site-specific conditions of the type discussed beginning in Section 5 of this Appendix.

Landfill. Conceptual design of a prospective CCR landfill at each candidate site for new construction was performed by consultant GAI and involved the use of the computer software AutoCAD Civil 3D. This software is an industry standard solution for civil engineering design and documentation. Application of the software included the procedures outlined below. The procedures are consistent with KY Siting Requirements for Special Waste Landfills (401 KAR 45:130).

- Initial area. A topographic map of each area was reviewed for obvious areas to be avoided. A preliminary landfill footprint on the order of 200 acres was placed on the map at a location that professional judgment indicated would be potentially suitable. This footprint was adjusted as needed during the remaining design steps.

- Base topography. A digital "existing ground" surface was created based on the available topographic mapping (USGS or aerial flown topography) in the area of proposed landfill alternative.
- Subgrade. The terrain beneath and around the conceptual landfill was designed based on rock blasting and earth moving sufficient to create a subgrade, including a minimum 100 feet wide valley floor, and subgrade slopes with a minimum gradient of three percent and maximum side slopes of 3 horizontal to 1 vertical. Each design included a 60-foot-wide corridor around the perimeter of the landfill to provide room for diversion channels, collection channels, liner termination, and site access. This corridor was sloped such that water could effectively drain around the entire landfill footprint, and into sediment and/or storm water ponds. Earthwork volume estimates were approximated using AutoCAD software by comparing the elevation differences between existing ground topography surface and the subgrade surface after excavation/earthmoving.
- Liner. The conceptual design provides for placement of a composite liner system beneath the entire landfill footprint. The conceptual designs were based on a system consisting of, from bottom to top, 6 inches of prepared subgrade, a 24 inch low permeability compacted soil liner, linear low density polyethylene (LLDPE) geomembrane liner, cushion geotextile, 12 inches of leachate collection system drainage layer to effectively drain leachate water out of the landfill, and 24 inches of protective cover ballasting material to protect the liner system during operations.
- Landfill. Conceptually, the landfill design assumes a series of lifts with intermediate slopes, benches, and cover. Benches would be 15 feet wide separated 17.5 feet vertically. The maximum intermediate slope between benches would be 2.5H:1V. The overall effective slope would be 3.5H:1V. The footprint of the landfill was adjusted to ensure the upper surface or top of the landfill had room for final completion of the project if existing site topography permitted. The footprint was increased if necessary to provide such room, if possible. If the top surface had more room than needed, the footprint was adjusted to be smaller, if possible based on existing site topography, primarily to reduce the size and cost of the liner system.
- Cover. The landfill final cover is conceptually designed as 24 inches of soil material (minimum 12 inches of cohesive soil below a non-cohesive vegetated soil layer) which would account for 2 feet over the entire landfill's footprint.
- Capacity estimate. The capacity for CCR storage is calculated in Civil 3D by first computing the volume created between the subgrade land surface and final landfill surface. Unless more site specific information is available, this volume is reduced by 5% to account for the space expected to be taken up by the drainage system, liner, final cover, and future access/haul roads on the face of the landfill.

Transportation facilities. The design of transportation facilities begins with an initial selection of long haul transport to the site by pipe conveyor, barge, or truck, or some combination of these. Specific design elements then proceed as follows.

- Pipe conveyor. The pipe conveyor system is a reliable and environmentally friendly means of short range CCR transport. The pipe conveyor is similar to a conventional belt conveyor in that it utilizes belting which transports the CCR materials. However, the pipe conveyor belt is much wider, which allows it to be loaded with material and temporarily formed into a tube to completely surround the CCR material protecting it from the elements (like wind, rain, etc.), until the material is discharged at the landfill or CCR disposal facility. The pipe conveyor can be designed to negotiate curves horizontally and vertically, unlike a conventional conveyor. This greatly reduces the number of required transfer points, which can generate dust between the material loading end at the plant and the material unloading end at the disposal facility. Change of direction can be accomplished without an intermediate transfer point where dust would be generated. At the discharge end of the pipe conveyor is an enclosed termination building, where CCR material would be loaded onto haul trucks to be taken to the disposal facility, or transferred to a short-term storage building via enclosed telescopic chutes, if needed. This building will provide a few hours of covered storage. Material will be moved to the storage building when trucks are temporarily not available for short periods of time. Front end loaders will be used to recover the CCR material from the short-term storage building and load it into trucks. The entire process will take place indoors to reduce fugitive dust created during the loading process. CCR stockpiles and the roads that the trucks travel over to the working face will be watered as necessary to control dust. In line with LG&E's desire to provide redundant control systems in order to avoid costly stoppages of CCR material transport, a haul road will approximately parallel the pipe conveyor corridor for all alternatives. The haul road will be designed and constructed to withstand the full weight of trucks required to keep up with CCR production on a temporary basis, assuming the pipe conveyor is off-line or out of service and CCR must be hauled from the onsite treatment facility to the landfill temporarily via truck.
- Barge. Barge transport would require the construction of a conveyor system (either pipe conveyor or conventional conveyor) from the existing onsite storage at TC Station to a barge loading facility along the Ohio River. It is likely that the space available at the existing TC Station barge loading area would need to be expanded in order to handle the full capacity of CCR material production. It would also require a new barge unloading facility near the off site CCR disposal facility. While barging would be the primary mode of transportation for alternatives that are of long distance proximity to TC Station, the CCR material will still need to be unloaded onto a different mode of transportation (either pipe conveyor or directly onto truck) in order to move it from the river to the CCR disposal facility. During times where the barge transport system would be unable to be utilized due to adverse river conditions (i.e. flooding or freezing) or barge facility maintenance/downtime, the CCR material would need to be hauled via truck to either the

intended CCR disposal facility, or a different site (for example an existing municipal solid waste (MSW) facility).

- Truck. For some alternatives, truck hauling is the only means of feasible transportation, for example when the distance to a CCR disposal facility is too great for pipe conveyor and the CCR disposal facility is not located close enough to navigable water to utilize barging. Truck hauling is the least cost effective means of transportation but under some circumstances is the only option. As mentioned above, even the use of pipe conveyor as a primary mode of transportation will require the CCR material to be placed on a truck and hauled into the actual CCR landfill or other disposal facility (e.g., mine). In other instances, it may make more logistical and/or economical sense to place the CCR material on trucks (instead of pipe conveyor) and haul the material to the CCR disposal facility, avoiding an unnecessary transfer point and additional capital costs of pipe conveyor construction. This approach is most appropriate when the distance to the CCR disposal facility is relatively short, i.e. on the order of less than one mile.

Ancillary facilities. The other primary elements considered during conceptual design are leachate treatment, surface water management, and borrow areas.

- Leachate treatment. For landfill alternatives, water that contacts the working face of the landfill will be conveyed through the landfill material via infiltration or vertical chimney drains into a leachate collection system, a series of pipes and porous drainage media designed to limit the hydraulic head on the liner system and drain the leachate water to a lined leachate pond.

  The leachate pond would be lined with a geosynthetic and concrete fabric-formed lining. The pond would ideally be positioned at the toe of the landfill, where the main leachate collection system pipe leading from the landfill would discharge into the upper end of the pond. If necessary based on effluent requirements and chemical testing of the leachate, the leachate would need to be treated, by being a) transported to TC Station and treated at a planned treatment facility, b) transported to a existing Surface Water Treatment Facility (SWTF), or c) treated in a new leachate treatment facility that would need to be constructed locally.

  The leachate pond would be designed to store the maximum average 15-day leachate volume production based on simulated climatological data and calculations in the Hydrologic Evaluation of Landfill Performance (HELP) model, a widely used computer program that models various conditions of the landfill (slope, slope length, landfill material permeabilities, leachate collection system pipe spacing, etc) to determine the estimated leachate production for given climate and precipitation data.

- Surface water management. For landfill alternatives, surface water will need to be controlled using a series of collection channels, diversion channels, waterbars, slope drains, culverts, and Erosion and Sediment / Stormwater Management (ES/SWM) Ponds. Surface water that does not come in contact with the active working area of the landfill will be isolated from the contact water

and conveyed to an ES/SWM Pond(s). The ponds would be sized based on Kentucky Best Management Practices for Controlling Erosion, Sediment, and Pollutant Runoff from Construction Sites Manual guidance for Kentucky sites or similar regulatory guidance documents for Indiana sites.

- Borrow areas. Soil and clay material are used in the subgrade, liner, intermediate cover, and final cover systems at CCR landfills. The need for this material makes alternatives that are close in proximity to potential borrow areas more desirable, all other considerations being equal. For ridge top sites an additional logistical consideration is to account for the cost of double handling of borrow material if the material inside of the landfill footprint is to be used as borrow soil. Where CCR will be placed on the ridge tops, the soil must be removed prior to being needed for fill or cover, and therefore must be set aside in stockpiles for subsequent use. Double handing and stockpile construction are added components of the actual project to be considered in evaluating costs and impacts. For landfill alternatives, it is imperative to purchase property such that enough soil and clay borrow material needed for the landfill subgrade, liner, intermediate cover, and final cover systems can be obtained locally, as opposed to purchasing and importing the material from external locations/sellers. At a conceptual level (prior to subsurface investigations) standard planning is to identify areas for available soil and clay borrow material that exceeds the estimated required soil and clay by two to three times, i.e., a factor of safety in the range of 2 to 3. This takes into account that all material identified in a paper study as borrow material will either not exist or not be suitable. For alternatives located in proximity to Ravine B, existing soil investigations including boring and test pit data can be reliably counted on to quantify the amount of useable soil and clay borrow material available (i.e. the depth of soil and clay are reasonably known, therefore one can calculate the acreage needed to obtain a volume required to meet sufficient factors of safety). For alternatives that are located away from Ravine B, online and published county soil surveys were utilized to estimate the amount of useable soil and clay in the proximity of the proposed landfill.

5. 100-YEAR FLOODPLAIN

Regulatory standards strongly discourage if not preclude building a CCR landfill in a floodplain of a significant waterway (33 CFR Part 320.4(I)(3); 401 KAR 45:130; 401 KAR 30:031). In its letter of July 11, 2014 EPA stated that it "concurs with the position, taken in the LG&E's alternatives analysis that sites located within the 100-year floodplain of the Ohio River are impracticable alternatives". Thus any site at which a significant portion of the landfill would have to be located in the Ohio River floodplain is considered not to be practicable.

If a project requires barge facilities, these will of necessity be located in the floodplain and possibly the floodway, and will require additional agency coordination, including with the Federal Emergency Management Agency (FEMA). Depending on the fill amount, surrounding area, and adjacent property owners, FEMA may require a Conditional Letter of Map Revision (CLOMR) and a Letter of Map Revision (LOMR) for the Project's disturbance. These letters are part of the administrative procedure by which

Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) reports are revised. Past experience indicates that following the initial contact made with FEMA, this process may take two years or more before construction is able to begin.

The 100-year floodplain boundary used in this analysis was sourced from online Geographic Information Systems (GIS) database, http://kygeonet.ky.gov.

6. CEMETERIES

The locations of cemeteries were identified based upon historical map research, SHPO cultural resources files, and information available from websites such as Findagrave.com. By law, any cemetery potentially impacted by a CCR disposal facility in Kentucky must be avoided or relocated. As discussed beginning on page 19 in GAI (2014), relocation is a practical impossibility for any cemetery that has more than a few graves or has graves for more than one family. This is because reburials require extensive and often impossible coordination efforts to satisfy state regulations concerning notification and disinterment agreements with next-of-kin. One denial by a single next-of-kin can delay or halt the relocation planning process indefinitely, making an alternative requiring cemetery relocation impracticable. Currently, the cemeteries in proximity to Site Alternatives analyzed in this Supplement appear to be well marked and thus cemeteries are assumed as being able to be avoided in the conceptual design process.

7. WETLANDS AND STREAMS

The evaluation and regulatory permitting of impacts to streams and wetlands that would result from the construction and operation of a given landfill project involves a multi-step process. The logistical efforts required depend largely on the ecological setting and land use in the location of a site alternative. The logistical efforts include the initial evaluation of the extent of streams and wetlands and aquatic quality within a defined study area, designing of the landfill project so as to avoid streams and wetlands where feasible, and coordination with the state and federal regulatory agencies on project-specific studies and application materials.

The impacts to streams and wetlands resulting from the construction of the various case studies was essentially evaluated by one of two approaches, dependent on whether a particular site footprint had been previously field-delineated for stream extents and classification (e.g., flow type and quality) as part of Ravine B vicinity studies. Streams within the Ravine B vicinity have been evaluated for stream quality through field surveys whereas other site alternatives were evaluated and estimated via desktop methods (published stream data such as U.S. Geological Survey's National Hydrography Data set, the National Wetland Inventory and other GIS mapping techniques based on topographic contour data).

The logistical effort required to obtain a Clean Water Act Section 401 and 404 individual permit is typically proportional to the linear feet or acreage of streams and wetlands, and the overall quality of each resource proposed as unavoidable impacts. However, a site alternative proposed to impact a large linear footage of ephemeral streams of poor quality could conceivably be a simpler permitting effort compare to a smaller amount of perennial and intermittent streams of high aquatic value and quality.

In terms of construction and operation of a landfill site, projects situated in settings having several high quality streams and wetlands within the impact area, or even downgradient of the impact area, will require more extensive efforts and cost to protect these areas from stormwater runoff in order to minimize adverse impacts to downstream water quality.

8. KARST FEATURES

On March 20, 2013 the KDWM sent an Intent to Deny application letter for a prior Ravine B alternative based upon the impact of the project on "Lime Cave.", which is also known as "Wentworth Cave." The letter stated "...that the excavation or destruction of the cave does not comply with the requirements of the Cave Protection Act in KRS 433.877(1)..." This letter also states, "...a final decision by the Division to deny the permit application would not preclude the submission of a new application for a similar facility in an alternate location." On May 2, 2013, the prior landfill application was denied on that basis. LG&E, GAI, and KDWM met on May 23, 2013 and discussed Site Alternatives to avoid the karst feature referred to as "Lime Cave" and sites that impact a large amount of karst features. Any site that has significant impacts to large karst features that could be caves as described in the Kentucky Cave Protection Act (such as the "Lime Cave") would be considered impracticable based on this precedent. Some Site Alternatives will require addressing the potential impact to other karst features. The construction costs to fill, grout, or otherwise avoid these karst features is not included in this analysis.

9. OTHER SITE FEATURES

Many aspects of a CCR site or project are not critical to determining if an alternative is feasible, but can impact practicability through their effect on costs. Those given consideration in the current Alternatives Analysis are briefly described below.

Utility Lines. The need to address electric, gas, water or sewer lines occurs when such lines are proximate to CCR facilities. Utilities will need to be abandoned if not needed subsequent to LG&E's project, or relocated if there is a need for them to continue to provide service. At the stage of evaluating alternatives, only major power or gas lines are considered to have potentially significant logistical effects. Aerial imagery, data from utility companies, and other available digital public information are used to determine locations and types of overhead and underground utility features.

Farmland. The Farmland Protection Policy Act requires the USACE to consider alternatives that would lessen the impact to prime farmlands. See 7 U.S.C. 4201 et seq. and 7 CFR Part 658. The USDA's Natural Resource Conservation Service (NRCS) soil surveys define prime farmland soils based on the specific mapped soil unit having certain soil qualities. The site alternatives were not quantitatively evaluated for the presence of prime farmland.

Cultural resources. Section 106 of the National Historic Preservation Act requires the USACE, as the lead federal permitting agency, evaluate a project's effects on cultural resources that may be eligible for listing to the National Register of Historic Places (NRHP) including archaeological sites and historical/ architectural resources. The work is conducted in phases. The initial Phase I survey identifies the Area

of Potential Effect (APE). The APE for archaeological sites is typically limited to the footprint of ground disturbing activities while the APE for architectural resources is expanded to take into account impacts to the viewshed and other considerations. This is followed by background research that includes a review of previously recorded cultural resources and records on file at various state agencies. In this instance, cultural resources files maintained by Indiana Department of Nature Resources, Historic Preservation and Archaeology (DHPA), Indiana State Historic Architectural and Archaeological Research Database (SHAARD), Kentucky Office of State Archaeology (OSA), and Kentucky Heritage Counsel (KHC), aerial photographs, local histories, and historic maps were consulted to identify previously recorded cultural resources, locations of structures over 50 years of age, location of former buildings, and areas of special concern, such as cemeteries, schools, churches, and a historic airfield. Landform settings and areas of prior disturbance were also assessed to identify locations of moderate to high archaeological site potential and areas with low to no archaeological site potential. Locations with the potential for deeply buried archaeological sites were also evident.

The initial Phase 1 study and background research described above was completed as part of this report for the Case Study alternatives Lee Bottom and Sterling Ventures, and can be found in Appendix III.B-2 and III.B-3, respectively. More detailed research and additional phases of cultural resources work were previously completed for the Ravine B area. No cultural resources investigations were completed for Valley View MSW Landfill.

Background research would be followed by a Phase I field survey to identify archaeological sites and historical/architectural resources over 50 years of age within the APE. Preliminary NRHP evaluations are made of all identified cultural resources and recommendations are submitted to the USACE and State Historic Preservation Office (SHPO).

Depending on the results of the Phase I surveys, it may be necessary to conduct Phase II testing of archaeological sites or conduct a Criteria of Effects study of architectural resources to further evaluate potentially NRHP-eligible resources. This evaluation process typically includes extensive field work to recover and document the archaeological site and extensive historical research for historic eraq archaeological sites and architectural resources. Based on the results of the Phase II investigations, the USACE consults with the SHPO to determine effects of the project on NRHP-eligible historic resources. In cases where adverse impacts (by a CCR project for a site alternative) to a NRHP-eligible resource are unavoidable, it will be necessary to mitigate adverse impacts to this resource. This is a lengthy and expensive process.

Threatened and endangered species. All alternatives in the region of TC Station that would require any amount of forest clearing are assumed to have the potential to impact habitat for the federally endangered Indiana bat (*Myotis sodalis*). Typically LG&E would be required to mitigate for impacts in accordance with an existing Memorandum of Agreement (MOA) with the USFWS's Kentucky Field Office. Mitigation requirements would also apply to a site in Indiana. The process would require preparation of a Biological Assessment addressing the Project's effects on the Indiana bat and other protected species (mussels, fish, mammals, and other animals as well as plants), including for example endangered mussel

species in the Ohio River. The potential occurrence of species can be determined through coordination with regulatory agencies, but extensive field studies may be required to determine the actual presence or absence of specific species. In many cases surveys for species may be restricted to certain times of year, potentially affecting schedule. If sensitive species are present, construction schedules could be affected.

Mining/Quarry areas. LG&E understands that EPA would advise against using a closed sand or gravel pit for CCR disposal, especially if located within the floodplain and construction would require excavation below the groundwater table. Thus, alternatives that are within above ground mining or quarry areas are considered to be impracticable due to the logistical issues associated with these practices. LG&E is also concerned that EPA may not approve disposal in any type of mine, but pending issuance of an EPA rule on the matter, LG&E has not used this concern to reject CCR management in an underground limestone mine.

Travel route and distance. Barge and truck transport will have energy consumption, air emissions, noise effects, and accident potentials that are generally a function of the travel route, distance required, and equipment used. The route and distance are calculated based on the shortest distance from TC Station to a CCR site, using the Ohio River (barge) or government maintained highways. The traffic volume is calculated based on CCR generation rates and capacity of the barge or truck.

For barge transport, the assumption is that each barge has the capacity to transport approximately 1200 CY of material at a time. Assuming 910,000 CY of CCR material needs to be managed each year, that would equate to a total of 758 barge loads per year, or approximately 15 per week. Assuming a loading rate of 600 tons per hour, it will take approximately 2 hours to load each barge and therefore four barges could be loaded in a single eight-hour work day. Assuming a similar rate for unloading of 600 tons per hour, it would take another eight-hour work day to unload the material. It is assumed that the barge transport itself can be accomplished at night, taking advantage of daylight for loading/unloading operations. In order to meet the CCR production rate, it is assumed that one of two fleets of four barges each will need to be at the loading facility at all times.

For truck transport, the assumption is that each truck has the capacity to transport 18 cubic yards at a time. If 910,000 cubic yards need to be managed each year, that would equate to a total of 50,555 trucks per year one way, or more than 100,000 trips round trip. If trucking were limited to 6 days per week, and 12 hours per day, then except for the off day any location along the route would be passed by a loaded or unloaded truck on the average of just over one every two minutes. Loading and unloading facilities would be designed to each handle at least 15 trucks per hour.

Impacts from truck transportation can be qualitatively evaluated based upon the types of roads that must be used (e.g., local county or divided highway) and whether the road passes through populated areas. Impact considerations include the number of residences located close to the roadway, and the presence of schools or other facilities of particular concern.

Aesthetics. A CCR landfill constructed above an existing landscape could be visible and audible to nearby residents or passersby. To identify this potential impact, a conceptual landfill is assumed to raise

aesthetic issues if its projected top elevation protrudes above the topographic mapped elevation of the surrounding terrain. Landfill design may be adjusted to minimize this impact. Further, LG&E has the general practice of purchasing land that is not needed directly for the project, if it would provide an aesthetic buffer for the surrounding population.

10. LAND ACCESS AND ACQUISITION

Alternatives using existing disposal sites may require land acquisition only for transportation and access, while other alternatives will also need land for the landfill and ancillary facilities. In either case, for LG&E to consider a candidate CCR site as potentially practicable, sufficient acreage must be reasonably available to allow for construction of all facilities with avoidance of critical features, provide for borrow material, and allow for buffer areas between the landfill and its neighbors.

Property line information was obtained from local Property Valuation Assessment (PVA) data or existing property mapping provided by LG&E. When the impact boundary encroached at all on a property, it was assumed that the property would need to be purchased in its entirety, with the exception of Sterling Ventures Mine, which assumes only portions of existing property encompassing the impact boundary needed to construct and operate barge unloading facility, pipe conveyor, and haul roads would be purchased due to these parcels being large (on the order of hundreds of acres each). Previous LG&E experience with property acquisition has shown that the timeline to purchase a single property from an owner willing to sell may take up to one year to complete negotiations and the purchase. Properties owned by unwilling sellers will cause even further delays, thus making the acquisition of the property unlikely without condemnation. At this time, LG&E has not confirmed it has effective powers of condemnation in Indiana.

11. PERMITTING

Even the simplest large-magnitude CCR project must comply with a considerable array of regulatory requirements and a permitting process that may take several years. Permitting requirements are expected to be greater than usual for any project that requires construction of barge terminals, or is sited on problematic terrain (e.g. due to factors such as steep slopes, karst features or cultural resources). The more complex a project, the more that permitting considerations will impact project costs and schedule. Where anticipated permitting issues could have the possibility to delay the Project schedule past the required CCR material placement date, LG&E assumes that emergency/temporary handling measures will need to be put in place.

12. RISKS

Utilities that provide a public service are exceptionally conscious of their obligation to ensure reliable service and thus are extremely sensitive to any condition that poses a risk to such reliability and service. This necessity to be risk adverse cannot always be reduced to economic or other terms, but is none the less critical to utility decision making and is a consideration of the Kentucky Public Service Commission "KPSC"). For management of CCR from TC Station, two risks have been given paramount consideration.

- Public safety. LG&E will be reluctant to implement any alternative that requires extensive trucking (e.g. the >100,000 trips per year noted previously) because of the essential certainty that there will be accidents with a probability of fatalities. This concern is over and above the expectation of public opposition to the quality of life impacts of such traffic on rural roadways. Additionally, the large amount of truck traffic on rural roads may be politically impracticable due to congestion, road damage safety issues, and disruption of residential life.
- Uncertainties and unknowns. LG&E will have serious concerns regarding any alternative that has unusual uncertainties and unknowns that cannot be resolved so as to assure the project purpose can be achieved. An example would be where the capacity of a site is speculative and determined by actions outside LG&E's control. Commitment of large capital sums where substantial uncertainties exist as to whether the project purpose can be achieved is not prudent, and is at substantial risk of being disallowed by the KPSC.

Any alternative with either of these risks will require close scrutiny if it otherwise is determined to be technically feasible, apparently competitive in cost, and otherwise potentially practicable.

APPENDIX III.D-1.
Methods for Assessment of Costs

APPENDIX III.D-1 – METHODS FOR ASSESSMENT OF COSTS

SECTION 1: APPROACH TO COST ANALYSIS

- Costs for the four case study alternatives are presented in conceptual detail in Tables III.D-1 through III.D-4 in the Supplement. For selected other alternatives, cost information is provided in Appendix IV.A-2. Analyses of project costs can apply different methodologies depending on the purpose for which the cost estimates are being made. For an alternatives analysis, the primary requirement is to generate costs that allow a fair comparison among conceptual alternatives. As such the cost analysis in GAI (2014) and in this Supplement reflects the following considerations.Costs that are common to every alternative do not need to be estimated or presented. An example for the case of CCR disposal is that all material must be processed and treated to be in a dry form (<20% moisture content) before it is transported offsite. At Trimble County Generating Station, this cost alone is estimated to exceed $6 per cubic yard. The treatment cost does not vary among alternatives and therefore is not included in the cost comparisons among alternatives. The costs in the Supplement are those appropriate for comparison among disposal alternatives, and do not represent the full cost of CCR management.
- Cost factors that are simple multipliers of construction costs are not included. An example of this is any allowance for contingencies or uncertainties. The effect of such a multiplier is to widen the gap between the lower and higher cost alternatives, which has the potential to bias the analysis toward the lowest-cost option. An exception to this consideration can be when these simple multiplier costs are projected to be significant for one type of CCR disposal facility (e.g. landfill) and insignificant or absent in another (e.g. mine). In addition, in a few instances, where a cost was developed based on a bid from a third party, which included a contingency, this is included if LG&E determined it was justified. In the late stages of an alternatives analysis, these factors can be considered if and when there may be marked differences in engineering or contingency costs between two alternatives that are otherwise close in cost.
- The line items included in the cost analysis in GAI (2014) were not "all inclusive", i.e. the line items included were only those anticipated to differ significantly between landfill alternatives. Consequently, a number of line items and their associated costs were excluded, assuming they were similar among all alternatives considered, and would not affect the overall cost difference between alternatives[1]. However, in this Supplement there are two case studies (Sterling Ventures and Valley View) that do not involve construction and operation of a conventional CCR landfill, but instead will charge a tipping fee to accept CCR material from LG&E. Therefore, Tables III.D-1 through III.D-4 include line items 38 and 47, "Additional Capital Costs" and "Additional Operations and Maintenance (O&M) Costs" respectively, to account for these costs

[1] While the Valley View Municipal Solid Waste Landfill, which was an alternative considered in GAI, 2014, is not a landfill alternative that LG&E would construct and manage, the costs associated with that alternative were so far in excess of the costs for the Ravine B alternative that it was not believed to be necessary to include these additional costs for all other alternatives solely for the sake of comparison to Valley View.

that can no longer be omitted as they will now vary between alternatives. The additional line items and associated costs included on Tables III.D-1 through III.D-4 are explained further in Support Document III.D-1-17 provided on a digital disk submitted with this Supplement.

- No consideration is given to timing factors that are common in many types of financial analyses, such as for a rate-of-return determination. There is no adjustment for inflation on future operations costs, possible future increases in energy costs, discounting to bring future costs to present value, or return on investment if operation costs are fully funded on Day 1 but only expended over time. LG&E considers the gross costs for construction and 37 years of operations to provide the fairest comparison of relative costs among alternatives.
- Costs that are expected to be small for any alternative are not quantified. An example is the cost for relocation of local water, sewer and other utility lines, which are typically a fraction of one percent of total costs. These small costs are reasonably ignored given they are dominated by the costs of landfill and transportation system construction and operation. In contrast, relocation of a large transmission line is costly enough to be considered.
- While LG&E understands that unit costs can vary on a year to year basis, costs in this analysis are not adjusted based on a particular year. Costs in GAI (2014) are based on 2012 data. Accordingly, to respond to EPA's requests for additional documentation on evaluated alternatives, the Supplement uses the same 2012 cost basis and provides more detailed documentation of the underlying cost estimates. A few cost elements developed specifically for this Supplement are based upon 2013 or 2014 information. For initial comparison purposes, it is considered acceptable to have a mixture of years in the cost estimates, so long as for any one project element (such as barge transportation) the estimates are consistent among all alternatives (in that case, 2014). In the late stages of an alternatives analysis, adjustment of costs to a common year can be considered if and when the result could markedly affect the cost comparison between two alternatives that are otherwise close in cost.
- Costs are based on relatively comparable levels of conceptual engineering. The expectation is that for any alternative, more detailed design-level engineering would identify additional cost items or contingencies. To make a fair comparison, costs for all alternatives have been made based solely on conceptual-level engineering. The assessment is more detailed for alternatives in Section III and order-of-magnitude for alternatives in Section IV.

The Alternatives Analysis in GAI (2014) involved estimation of planning-level costs for several dozen CCR disposal alternatives. This Appendix documents the methods used for those estimates in more detail than was provided in GAI (2014), as well as additional cost information analyzed specifically in the case study analysis.

The development of the comparison cost estimates for the alternatives included the following steps, detailed in the following sections of this Appendix.

- Section 2 describes the identification of project elements which may be different between generic alternative designs that would account for major cost components. Construction and operation elements were identified separately based on experience with the full range of elements in a large CCR disposal facility project.
- Section 3 describes how a unit cost was prepared based on known or reliable cost sources such as a.) known standardized construction cost estimating reference books (e.g. RS Means), or b.) estimated costs quoted specifically for the alternatives analyzed in this report, or c.) estimated costs quoted from similar components of comparable past projects (i.e. past construction bid/cost experience and/or vendor/supplier quotes) for each category of project element.
- Section 4 describes how the magnitude (or unit quantity) of each element was estimated based on conceptual design drawings or other project-specific considerations.
- Section 5 describes how costs for each project element were totaled by multiplying the unit cost by the unit quantity. Costs for a few project elements were calculated on a specific site-by-site basis. An example explanation of how the unit costs and unit quantity are used to develop the cost for a particular Line Item is also included in this section.

Each step in this methodology is explained and documented here in Appendix III.D-1. If a unit cost requires additional justification or backup information, it is included in the Support Documents provided in the digital disk submitted as part of this Supplement. Appendix III.C-1 describes the conceptual design process for CCR landfills and the types of project attributes that may require a cost estimate. Tables III.D-1 through III.D-4 provide the results of the application of these methods to the four case studies.

SECTION 2: PROJECT ELEMENTS ANALYZED FOR COST

The first step in the assessment of costs was to identify the project elements that would account for major costs for a CCR disposal facility. Based on past experience with construction and operation of large CCR disposal facilities, project elements that were anticipated to cause significant differences in costs between the alternatives were identified as described below. As described above, project elements that were anticipated to be similar or the same between alternatives [for example, project management, quality assurance/quality control (QA/QC), CCR treatment and transportation system at TC Station, etc.], were not included in the cost analysis.

The following project elements were identified to be major components for a CCR disposal facility for which costs were to be developed. The project elements have been grouped between capital and operation and maintenance (O&M) costs.

Line Item #	Description	Cost ($)	Per Unit
Capital Costs			
1	Property Acquisition	$12,000	Acre
2	Clearing, Grubbing, and Site Preparation	$17,000	Acre
3	Large Utility Line Relocation	$880	Linear Foot

Line Item #	Description	Cost ($)	Per Unit
			(LF)
4	Fencing	$50	LF
5	Environmental Wetland Mitigation (cost based on adjusted mitigation units (AMU) and may be increased by 1.2 factor for temporal loss if In Lieu Fee option is utilized; rate of $72,000/acre includes the 1.2 factor)	$72,000	Acre
6	Environmental Stream Mitigation (cost based on AMU and may be increased by 1.2 factor for temporal loss if In Lieu Fee option is utilized)	$170	AMU
7	Cultural Resources (Potential Phase III data recovery)	Varies	EA
8	Indiana Bat Mitigation	$5,338	Acre
9	Road Relocation (County Road)	$350	LF
10	Road Relocation (State Road)	$400	LF
11	Pipe Conveyor Transport (similar to North Ridge Top path at Ravine B)	$2,150	LF
12	Pipe Conveyor Transport (similar to Ogden Ridge Road path at Ravine B)	$2,425	LF
13	Pipe Conveyor Transport (similar to South Ridge Top path at Ravine B)	$3,125	LF
14	Transfer Station	$250,000	EA
15	Haul Road - Off Landfill	$1,600	LF
16	Bridge - Large (36 Feet (FT) high, 440 FT long, 60 FT wide)	$4,000,000	EA
17	Bridge - Medium (200 FT long, 60 FT wide)	$1,750,000	EA
18	Perimeter Collection Channel - Fabric Form, 6-10' Bottom Width	$75.00	LF
19	Upslope Drainage Diversion Channel - Fabric Form, 1-5' Bottom Width	$50.00	LF
20	Subgrade Preparation - General Earthwork - Soil Inside Footprint (3000 foot Round Trip)	$5.65	CY
21	Subgrade Preparation - General Earthwork - Rock Blasting (3000 foot Round Trip)	$21.72	CY
22	Subgrade Preparation - Borrow or Spoiling Excess Material - Soil - 1/2 Mile	$5.65	CY
23	Subgrade Preparation - Borrow or Spoiling Excess Material - Soil - 1 Mile	$5.94	CY
24	Subgrade Preparation - Borrow or Spoiling Excess Material - Soil - 2 Miles	$6.84	CY
25	Subgrade Preparation - Borrow or Spoiling Excess Material - Soil - 4 Miles	$8.36	CY
26	Landfill Composite Liner System - 0.5 mi Round Trip Protective Cover/4 mi Round Trip Drainage Layer	$91,000	Acre
27	Landfill Composite Liner System - 1.5 mi Round Trip Protective Cover/4 mi Round Trip Drainage Layer	$93,000	Acre
28	Landfill Composite Liner System - 0.5 mi Round Trip Protective Cover/2 mi Round Trip Drainage Layer	$88,000	Acre
29	Groundwater Underdrain Drainage Pipes	$6,000	Acre
30	Leachate Collection System Drainage Pipes	$15,000	Acre
31	Large Erosion and Sedimentation/Stormwater Management (ES/SWM) Pond and Leachate Pond - Earthwork and Liner System (~35 acre-ft)	$3,000,000	EA
32	Medium ES/SWM Pond and Leachate Pond - Earthwork and Liner System (~20 acre-ft)	$2,000,000	EA
33	Final Cover System - 2 Mile Round Trip (12 Inches Clay; 12 Inches Topsoil)	$29,000	Acre
34	Final Cover System - 4 Mile Round Trip (12 Inches Clay; 12 Inches Topsoil)	$33,000	Acre

Line Item #	Description	Cost ($)	Per Unit
35	Barge Loading Facility	$8,300,000	EA
36	Barge Unloading Facility	$16,100,000	EA
37	Ancillary Costs (Critical Spares and Office/Warehouse Space)	$1,600,000	EA
38	Additional Capital Costs	Varies	LUMP
Operation and Maintenance (O&M) Costs			
39	Hauling - 1 Mile Round Trip (22 CY on landfill/private road)	$2.56	CY
40	Hauling - 2 Mile Round Trip (22 CY on landfill/private road)	$3.46	CY
41	Hauling - 3 Mile Round Trip (22 CY on landfill/private road)	$4.19	CY
42	Hauling - 30 Mile Round Trip (18 CY, 35 MPH avg)	$11.55	CY
43	Offsite CCR Disposal - Tipping Fee	Varies	TON
44	Pipe Conveyor Cost of Operation	$0.20	CY
45	Barge Loading and Unloading Operation Cost	$1,100,000	YR
46	Barge Transportation Costs	Varies	TON
47	Additional O&M Costs	Varies	LUMP

SECTION 3: UNIT COST DESCRIPTION

A variety of sources were consulted to calculate the unit costs for each project element. For standard construction costs, such as hauling, excavating, general earthwork, etc, the 2012 edition of *RS Means Heavy Construction Cost Data* was used. RS Means is widely accepted in the construction industry as one of the standards in construction cost valuation. The RS Means source provides unit costs on a nationwide level and a 'location factor' for various cities/areas throughout the United States that allows for inflation or deflation of unit costs. The 'location factors' are percentage ratios of a specific city's material and labor costs to the national average cost of the same item. The location factor from Frankfort, KY was selected for use in all cost estimating, as it is the city listed in RS Means with the closest proximity to the alternatives evaluated. The location factor used in all RS Means sourced unit costs is 0.76.

More complex project element costs (such as property acquisition, utility relocations, bridges, haul road, ponds) were typically developed from GAI or LG&E experience on previous projects and adapted or scaled to the conceptual alternatives analyzed herein. For other project elements that required outside reference (such as off-site CCR disposal/tipping fee or pipe conveyor and barge transport), unit cost information was sourced from available vendors and suppliers in the form of price quotes and budgetary cost estimates. All costs are calculated on a 2012 dollar basis except as noted in Section 4. A breakdown of the unit costs, including a listing of the elements combined to develop each unit cost, can be found in Table Appendix III.D-1– Unit Cost Development. A description of the layout and format of Table Appendix III.D-1 is as follows:

> From left to right, the column headings include the Line Item number, a checkbox that identifies whether the project element is a capital or O&M cost, a description of project element, the unit cost, the unit, the source of costing information, the RS Means # (if applicable), and any conversion calculations used to convert units. When multiple sub-items comprise a line item, the total was added up and rounded for ease of calculation.

Line Item costs that were developed from RS Means display the RS Means Item Number (correlates to the Line Item number provided in the *2012 RS Means Heavy Construction Cost Data* source books), the Line Item's original cost and unit, the adjusted cost using the location factor for Frankfort, KY, and, if necessary, the unit adjustment equation to calculate the cost in a more reasonable and easily estimated unit for the estimate (for example, converting a $ per square yard cost into $ per acre). The scans of the pages from RS Means used for the unit cost development are included as Support Document III.D-1-1.

For Line Items not developed from RS Means, and that required additional backup cost sheets, price quotes, or calculations, a short description of the source is included in the fourth column and a reference to Support Documents III.D-1-2 through III.D-1-19 is listed in the last column on the right of the table. Support Documents III.D-1-2 through III.D-1-19 include detailed backup for how these unit costs were developed.

SECTION 4: UNIT QUANTITY DEVELOPMENT

Once the Line Items were identified and unit costs for those elements were developed, the unit quantity of each Line Item was estimated for various alternatives based on conceptual design drawings and/or other project specific considerations as described herein.[2] A description of how the units for each Line Item were quantified is described below. Also included for each Line Item is a listing of the unit cost and how the unit is multiplied by the unit cost in order to quantify the estimated cost for each Line Item.

CAPITAL COSTS

Line Item 1 - Property Acquisition – A conceptual impact boundary was developed based on space required to build the CCR disposal facility, roads, pipe conveyor, borrow areas, spoil areas, laydown facilities, erosion and sedimentation/stormwater management (ES/SWM) ponds, and other ancillary facilities needed for a case study alternative. Property line information was obtained from local Property Valuation Assessment (PVA) data or existing property mapping provided by LG&E. When the impact boundary encroached at all on a property, it was assumed that the entire property would need to be purchased, with the exception of Sterling Ventures Mine, which assumes only portions of existing property encompassing the impact boundary needed to construct and operate barge unloading facility, pipe conveyor, and haul roads, would be purchased due to these parcels being large (on the order of hundreds of acres each). The total acreage of property is multiplied by the unit cost of $12,000/acre (a cost provided by LG&E based on past real estate experience[3]) to quantify the cost to acquire the property.

Line Item 2 – Clearing, Grubbing, and Site Preparation – Line Item 2 is comprised of the following two components, with unit costs given on a 'per acre' basis:

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[2] Detailed cost estimates were not needed for all alternatives for purposes of a comparative, screening level analysis. For example, a number of alternatives were determined to be not practicable based on key logistical concerns (such as lack of capacity) alone.

[3] All property was assumed to be $12,000/acre. However, property value may vary based on location. For example, Lee Bottom Flying Field may be more expensive.

-Cut and Chip Trees

-Grub Stumps and Remove

A conceptual impact boundary was developed based on space required to build the CCR disposal facility, roads, pipe conveyor, borrow areas, spoil areas, laydown facilities, ES/SWM ponds, and other ancillary facilities needed. The total forested acreage within the impact boundary, defined as any area observed to have tree cover, was calculated using United States Geological Survey (USGS) and/or aerial imagery mapping. This acreage was multiplied by the unit cost of $17,000/acre to quantify the cost to clear, grub, and prepare a site for development.

Line Item 3 – Large Utility Line Relocation – To quantify the length of utility line relocation for an alternative, aerial photography was used to identify large overhead transmission lines similar to the one that crosses the existing LG&E property in Ravine B. Where these lines crossed a facility, a route around the facility was sketched and the length of the approximate rerouted line was measured.

In order to calculate a cost for Line Item 3, the total linear footage of the utility line that crossed over the facility was multiplied by the unit cost of $880/linear foot (LF).

Minor utility line relocations are not included in this analysis.

Line Item 4– Fencing – Multiple components were included in the development of the total unit cost used in Line Item 4. These components include:

- Corner posts, line posts, corner and end post bracing, top rail, rail – middle/bottom, reinforcing wire, steel t-post, barbed wire, extension arms, eye tops – 2-3/8", chain link fencing, and gates.

With a few exceptions, fencing was placed to enclose the entire project area of an alternative, resulting in the conceptual impact boundary perimeter generally being used for the quantity. Where the topography, such as steep slopes, did not necessitate fencing or where there was already an existing fence present, such as around the TC Station, fencing was not quantified.

In order to calculate a cost for Line Item 4, the total linear footage of the impact boundary perimeter was multiplied by the unit cost of $50/LF.

Line Items 5 and 6 – Environmental Wetland and Stream Mitigation

For the Ravine B alternative, actual field-verified data and location coordinates were utilized within a GIS program to determine the total stream lengths and wetland acreages that would be impacted.

Where field-verified stream and wetland data were not available, GIS mapping techniques and publically available data sources from various government agencies were utilized to estimate the lineal feet of streams and acreage of wetlands that may be impacted. An impact boundary was first established for an alternative based on predicted land disturbances from various construction and operational activities. The locations of potential wetland areas were obtained from the National Wetland Inventory (published

by the United States Fish and Wildlife Service [USFWS]). The locations of major streams were obtained from the National Hydrography Dataset (published by the United States Geological Survey [USGS]). The location of smaller streams were estimated utilizing published topographic contour data by delineating (in GIS software) streams based on the presence of ravines and high-gradient slopes. Assumptions were made concerning the stream type (ephemeral or intermittent) for these contour-based stream estimates. These assumptions were based upon knowledge of the terrain and typical stream occurrences in such areas of the Bluegrass bioregion and surrounding areas.

Under the wetland and stream compensatory mitigation Fee In-Lieu Of (FILO) program, the United States Army Corps of Engineers (USACE) directs an applicant to utilize multipliers based on the table published on the USACE's Louisville District website as presented below. To derive the amount of adjusted mitigation units (AMUs) for a specific stream reach, the multiplier is selected from the USACE's table based on the stream's flow classification (ephemeral or intermittent for this Project) and the stream's quality based on the narrative rating (good, fair, poor). The narrative rating is determined from the stream habitat score that is calculated utilizing the high-gradient stream data sheet procedure. The completion of the high-gradient stream data sheet procedure, which constitutes the rapid bioassessment protocol, is described in Kentucky Division of Water's (KDOW) Methods for Assessing Habitat in Wadeable Waters (2011).

The Kentucky Department of Fish and Wildlife Resources (KDFWR) is the state agency responsible for implementing stream and wetland restoration projects in Kentucky under the FILO program, and the agency establishes the costs per AMU for compensation purposes. The cost rate of $170 per stream AMU and $72,000 per wetland acre (based on mitigation ratio of 2.0 for all wetland acres and temporal loss factor of 1.2 as the USACE requires) was utilized to estimate mitigation fees for all alternatives for which cost estimates were developed. These AMU cost rates were in effect at the time of the initial alternatives analysis (2012) where mitigation cost estimates were initially developed for several alternatives as reported in GAI, 2014. These AMU values were applied to all cost estimates for consistency and comparison of alternatives. Note that the actual mitigation fee for an alternative will be based on the AMU cost rate in effect at the time of project implementation. For example, the KDFWR's website (accessed September 25, 2014) reports a cost per AMU of $240 for stream impacts within the Salt River Watershed area, in which all alternatives are located with the exception of Lee Bottom, Sterling Ventures, and Bethlehem Terrace. A temporal loss and cumulative impacts factor of 1.2 is also applied to the total stream and wetland AMUs for a project that utilizes the FILO program. Note that this 1.2 factor was applied to the mitigation cost estimates for all alternatives for which cost estimates were prepared (e.g., the wetland mitigation fee would therefore be $72,000 per acre). If the option of purchasing mitigation bank AMU credits is selected instead of the FILO program, then the temporal loss factor may not apply.

The cost for Line Items 5 and 6 were calculated on a site-by-site basis based on the factors discussed above.

The USACE's website includes the following mitigation calculator tools, which were accessed on September 25, 2014 (http://www.lrl.usace.army.mil/Missions/Regulatory/Mitigation/InLieuFeeProgram.aspx).

Line Item 7 – Cultural Resources (Potential Phase III data recovery) – A high level, conceptual lump sum cost was developed for each case study alternative to perform Phase I to Phase III archaeological investigations on potential archeological sites and Phase I survey and Criteria of Effect Studies for architectural/historical resources that could be affected or disturbed as a result of the project. These cost estimates are based on the number and location of previously recorded archaeological sites and architectural/historical resources and the potential to find previously unrecorded archaeological sites and architectural/historical resources. Existing data sources were consulted during this process. The data sources include aerial photographs, historic maps, and records on file at various state agencies, such as Indiana Department of Nature Resources, Historic Preservation and Archaeology (DHPA), Indiana State Historic Architectural and Archaeological Research Database (SHAARD), Kentucky Office of State Archaeology (OSA), and Kentucky Heritage Counsel (KHC). Each location had landform variables that were also considered during this process. Steep slopes, disturbed settings, and wetlands have a low potential for archaeological sites. Moderately sloping landforms with intact soils have a moderate potential for archaeological sites. Gently sloping to level areas have high potential for archaeological sites. Due to proximity to water and water-related resources, intact floodplain and terrace settings along the Ohio River have the highest potential for large prehistoric sites that have the potential to provide significant information towards our understanding of regional prehistory. Historic era domestic sites built prior to the mid-twentieth century and not impacted by later development have the highest potential to provide significant information for understanding regional history. The cost for Line Item 7 was calculated on a site-by-site basis based on the factors discussed above[4]. See Appendix III.C-1 for further description of the cultural resources process.

Line Item 8 – Indiana Bat Mitigation – The result of the Endangered Species Act Section 7(a)(2) consultation process with USFWS will likely result in requirements for compensation of lost Indiana bat habitat for any alternative involving clearing of forested areas. Until the consultation process is complete, it is unknown if USFWS will request that land be purchased through a land trust or conservation bank, deeded to a conservancy, or accepted as a deposit through the Indiana Bat Conservation Fund (IBCF). However, the USFWS Biological Opinion on Conservation Memoranda (BO) provides a methodology to estimate the cost of the mitigation. The BO suggests using a base mitigation fee equal to the average value of farm real estate as published annually by the United States Department of Agriculture (USDA) Land Values and Cash Rents report, with a multiplier based on the season of Indiana bat occupancy. The Indiana Bat mitigation fee of $5,338 per acre was applied to all cost estimates for consistency and comparison of alternatives. This mitigation fee rate was in effect at the time of the initial alternatives analysis (2012) where mitigation cost estimates were initially developed for several alternatives as reported in GAI, 2014. The mitigation rate was calculated as the average of the lowest per acre fee of $4,575 (for tree clearing between August 14th through March 31st) and the higher cost per acre fee of

[4] Extensive cultural resources investigations have occurred to date in the Ravine B area as part of project planning/design. Therefore, cultural resources costs for alternatives located in the proximity of Ravine B represent more detailed knowledge and are estimated as being more expensive than off-site alternatives (e.g. Lee Bottom). As stated above, intact floodplain and terrace settings along the Ohio River have very high potential for archaeological sites.

$6,100 (for tree clearing between April 1st through August 15th) assuming the project area was designated as a "known maternity" area for the Indiana bat. The use of this average mitigation fee rate is based on the assumption that tree clearing would need to occur at various times throughout a given year, including during the maximum mitigation fee period, for construction purposes. Note that the actual mitigation fee for an alternative will be based on the mitigation fee per acre in effect at the time of project implementation (assuming that the USACE and USFWS requires this mitigation fee approach to compensate for habitat loss). For example, the project area is now (2014) designated as a "known non-materinity" area therefore the fee per acre could actually be less. Refer to Support Document III.D-1-4 for additional information on the basis of mitigation costs.

In order to calculate a cost for Line Item 8, the unit cost of $5,338/acre was multiplied by the total forested acreage within the impact boundary, where the acreage was estimated using USGS and/or aerial imagery mapping.

Line Items 9-10 – Road Relocation (County/State Road) – GAI developed a conceptual cost estimate to relocate a county and state road for an alternative evaluated in GAI, 2014. The total project cost for each road was divided by the total length of road being relocated to create a unit cost on a linear foot basis. These costs were rounded to $350/LF of county road and $400/LF of state road. Refer to Support Document III.D-1-6 for additional information on the basis of relocation costs. The following assumptions were made in the creation of the estimate:

-County road assumed as 18 ft out-to-out width (two 8' lanes with 1' shoulders),

-State road assumed as 24 ft out-to-out width (two 10' lanes with 2' shoulders),

-Drainage approximated as 20% of Paving and Earthwork cost,

-E&S approximated as 10% of Paving and Earthwork cost,

-Maintenance & Protection of Traffic approximated as 1.5% of Paving and Earthwork cost,

-Signing, Pavement Marking, and Delineation approximated as 1.5% of Paving and Earthwork cost,

-Mobilization approximated as 5% of Total Cost,

-30% contingency added, and

-Estimates do not include Right-of-Way Acquisition, Utility Relocation/Engineering, Post Construction Stormwater Management, Construction Phase Engineering, and Quality Assurance / Quality Control (QA/QC).

If an alternative required the relocation of county or state road(s), the approximate relocation was measured at a conceptual level. To calculate a cost for Line Items 9 and 10, the unit cost per linear foot for county ($350/LF) and state ($400/LF) roads was multiplied by the total linear footage of county and state roads being relocated.

Line Items 11-13 – Pipe Conveyor Transport – The Beumer Group provided price quotes for three pipe conveyor routes in the vicinity of Ravine B based upon existing topography and difficulty of

construction. Refer to Support Document III.D-1-7 for additional information regarding these quotes. These quotes included costs for design and supply, mechanical and electrical installations, and civil and foundation work. These quotes were then developed into a unit cost on a linear foot basis, by taking total length and dividing by the total cost for each. These unit costs are $2,150/LF for a route similar to the North Ridge Top path near Ravine B (conveyor runs north along Bottom Ash Pond at TC Station, crosses to the northeast on a bridge, and runs along Wentworth Road), $2,425/LF for a route similar to the Ogden Ridge Road path near Ravine B (conveyor crosses Highway 1838 due east on a bridge, travels east up the adjacent slope and along Ogden Ridge Road), and $3,125/LF for a route similar to the South Ridge Top path near Ravine B (conveyor crosses Highway 1838 due east on a bridge and travels southeast to the ridge tops).

For each alternative, one of the three pipe conveyor routes, which most closely represented the topography of the site, was selected and the linear footage of the conceptual proposed pipe conveyor was measured. This linear foot quantity was multiplied by the route's unit cost to calculate a cost for Line Items 11-13.

Line Item 14 – Transfer Station – Additional input from the Beumer Group included direction on when a transfer station would be needed in order to turn the pipe conveyor in a new direction along its route. When the pipe conveyor contains turns of a radius less than 1000 feet or changes in direction that exceeded 90 degrees, the Beumer Group suggested the use of one transfer station in each of the quotes. They quoted the transfer station at $250,000 each. Alternatives that could not meet the design criteria of minimum pipe conveyor radius of less than 1000 feet, or that had changes in direction that exceed 90 degrees based on existing ground topography or site constraints, were assumed to require a transfer station. Alternatives that had more than one instance of not meeting the design criteria would require multiple transfer stations. The number of transfer stations was multiplied by the unit cost of $250,000 to calculate a cost for Line Item 14.

Line Item 15 – Haul Road – Off Landfill – GAI developed an estimate of probable construction costs for a haul road during a more detailed design of the Ravine B alternative. Multiple components were included in the development of the total unit cost used in Line Item 15. These components include:

-Clearing and grubbing, excavation, foreign borrow excavation, subbase-20" depth (No. 2A), subbase-8" depth (No. 2A), bituminous tack coat, bituminous concrete base course-12" depth, bituminous binder course-4" depth, bituminous wearing course-2" depth, mobilization (assume 5% of roadway total), field laboratory, inspector's field office, equipment package, 18" reinforced concrete pipe, 24" reinforced concrete pipe, geotextiles-class 2-type B, fabricform ditch lining, construction surveying, erosion and sediment pollution control, and signing and pavement marking. Estimate does not include stormwater management, right-of-way, and utility relocation costs.

In order to calculate a cost for Line Item 15, the total linear footage of the haul road required for an alternative was multiplied by the adjusted unit cost of $1,600/LF. The length of haul road was dependent upon site layout and distance from the TC Station and/or CCR transfer location (i.e. barge unloading facility or pipe conveyor discharge). Per LG&E design requirement, the haul road must also parallel the

pipe conveyor route where possible to provide ease of access to the pipe conveyor for maintenance as well as for use as primary CCR transport during outages of the pipe conveyor.

Line Item 16 – Bridge – Large (36 FT high, 440 FT long, 60 FT wide) – GAI developed an estimate of probable construction costs for a 3-span prestressed concrete I-beam bridge over KY 1838 during a more detailed design of the Ravine B alternative. Multiple components were included in the development of the total unit cost used in Line Item 16. These components include:

-Structure granular backfill, masonry coating, penetrating sealer for deck, structure excavation-common, structure excavation-solid rock, steel piles-HP14X89, pile points 14", concrete-Class A, concrete-Class AA, concrete-Class C, steel reinforcement, steel reinforcement-epoxy coated, structural steel, expansion dam 4" neoprene, approach slab, prestressed concrete I-beams, 24" PVC schedule 40, 36" steel encasement, and neoprene bearing pads.

These components have base costs in various units but were quantified and totaled to calculate a total project cost of $3,604,000, rounded to $4,000,000 for the purpose of this cost analysis. The total cost did not include the following items:

-General mobilization, clearing and grubbing, construction surveying, embankment construction, utility relocation costs, permitting costs, and traffic control costs.

A large bridge unit was used in each alternative that required an approximate 400 foot span over road, stream, or other valley feature. The unit cost of $4,000,000 was multiplied by the number of large bridges necessary for an alternative to calculate a cost for Line Item 16.

Line Item 17 – Bridge – Medium (200 FT long, 60 FT wide) – A cost per square foot (SF) for various types and spans of bridges is provided in Support Document III.D-1-11. For the medium span bridges used in various alternatives, GAI selected a concrete deck with pre-stressed girder in a continuous span, which has an estimated cost of $145/SF. A bridge 200 FT long and 60 FT wide has a total area of 12,000 SF and therefore a total estimated cost of $1,740,000. This unit cost was rounded up to $1,750,000

Medium bridge units were used in alternatives that required an approximate 200 foot span over smaller road, stream, or other valley features. The unit cost of $1,750,000 was multiplied by the number of medium bridges estimated in an alternative to calculate a cost for Line Item 17.

Line Item 18 – Perimeter Collection Channel – Fabric Form, 6-10' Bottom Width – Line Item 18 estimated the linear footage of perimeter collection channels with an approximate range of 6-10' bottom width used to convey runoff from the conceptual landfill site to an ES/SWM pond. Multiple components were included in the development of the total unit cost of $75.00/LF used in Line Item 18. These components include:

-Excavation and loading, hauling-1 mile round trip, spreading, and fabric form liner.

The channels were quantified by measuring the perimeter of the conceptual landfill layout, where water would be collected and sent to the ES/SWM pond.

The unit cost of $75.00/LF was multiplied by the total linear footage, measured around the entire conceptual landfill layout, for each alternative to calculate a cost for Line Item 18.

Line Item 19 – Upslope Drainage Diversion Channel – Fabric Form, 1-5′ Bottom Width – Line Item 19 estimated the linear footage of upslope drainage diversion channels with an approximate range of 1-5′ bottom width used to divert runoff around the conceptual landfill footprint and bypassing the ES/SWM pond. The diversion channels were measured around the perimeter of the conceptual landfill layout, on the outside of the collection channels, and then to the end of the ES/SWM pond. Multiple components were included in the development of the total unit cost of $50.00/LF used in Line Item 19. These components include:

-Excavation and loading, hauling-1 mile round trip, spreading, and fabric form liner.

The unit cost of $50.00/LF was multiplied by the total linear footage for an alternative to calculate a cost for Line Item 19.

Line Item 20 – Subgrade Preparation – General Earthwork – Soil Inside Footprint (3000 foot Round Trip) – A conceptual subgrade was created for landfill alternatives using a 100-foot wide Ravine floor, minimum slopes of three percent, and maximum slopes of 3 horizontal (H) to 1 vertical (V). The cut and fill volumes required to build the conceptual subgrade were estimated using AutoCAD software to compare the elevation differences between existing ground and the subgrade surface. Line Item 20 quantified material within the landfill footprint, excluding rock, that can be taken from areas of cut and used in areas where fill is required within the conceptual landfill footprint. The unit cost associated with this Line Item was developed from the following components:

-Excavating, bulk bank, hydraulic crawler, 3 CY, for loading add 15%

-Hauling, 22 CY, off-road, 15 min wait/load/unload, 10 MPH, cycle 3000 feet

-General fill, by dozer, no compaction, and

-Compaction, sheepsfoot or wobbly wheel, 12″ lifts, 2 passes.

These components were totaled for a unit cost of $5.65/CY of material. To calculate a cost for Line Item 20, the unit cost was multiplied by the quantity of earthwork that could be used within the conceptual landfill limits of grading.

Line Item 21 – Subgrade Preparation – General Earthwork – Rock Blasting (3000 foot Round Trip) – Line Item 21 estimated the amount of rock material that would need to be excavated/blasted. The rock blasting quantity was estimated by taking the depth between existing ground and the proposed subgrade at points on a grid system. The top elevation of rock was assumed to be 15 feet below existing ground based on drilling programs performed in this region of Kentucky and online review of soils information in the area. The thickness of rock excavation (the depth of cut minus 15 feet) was multiplied by the area of each point on the grid. Finally, the total rock excavation volumes for all of the conceptual landfill footprint were summed. The unit cost associated with this Line Item was developed from the following components:

-Blasting and excavating/loading

-Hauling, 22 CY, off-road, 15 min wait/load/unload, 10 MPH, cycle 3000 feet

-General fill, by dozer, no compaction, and

-Compaction, sheepsfoot or wobbly wheel, 12" lifts, 2 passes.

These components were totaled to determine a unit cost of $21.72 per cubic yard of material. To calculate a cost for Line Item 21, the unit cost was multiplied by the quantity of rock material estimated to be excavated within the landfill limits of grading.

Line Items 22-25 – Subgrade Preparation – Borrowing or Spoiling Excess Material – Soil – ½, 1, 2, or 4 mile Round Trip – Line Items 22-25 estimated the amount of excess excavated material that could not be used as fill or additional borrow material brought into the landfill footprint in order to complete the subgrade construction. From Line Items 20 and 21, if excess material was produced or borrow material was needed to balance the estimated subgrade earthwork, the excess or deficit of material was quantified in Line Items 22-25. The material must be trucked to or from the landfill footprint and the distance from borrow sites spoil areas determines the hauling cost. The difference between Line Items 22-25 is the average round trip hauling distance assumed from the center of the landfill to the center of approximate borrow/spoil areas. The cost associated with this Line Item was developed from the following components:

- Excavating, bulk bank, hydraulic crawler, 3 CY, for loading add 15%

-Hauling, 22 CY, off-road, 15 min wait/load/unload, 10 MPH, cycle ½, 1, 2, or 4 miles (varies between Line Items)

-General fill, by dozer, no compaction, and

-Compaction, sheepsfoot or wobbly wheel, 12" lifts, 2 passes.

These components were totaled to determine a unit cost of $5.65/CY, $5.94/CY, $6.84/CY, and $8.36/CY of material, respectively. To calculate a cost for Line Items 22-25, the unit cost, using the appropriate mileage, was multiplied by the quantity of borrow/spoil material required to balance the site earthwork.

Line Items 26 through 28 – Landfill Composite Liner System ½ or 1.5 mile Round Trip Protective Cover / 2 or 4 mile Round Trip Drainage Layer – Multiple components were included in the development of the total unit costs used in Line Items 26, 27, and 28. These components include:

- 2 ft recompacted soil liner,

- geomembrane liner,

- cushion geotextile,

- 1 foot leachate collection system drainage layer, and

- 2 foot protective cover layer.

In order to calculate a cost for the Line Items 26 through 28, the area to be lined (i.e. the limits of the conceptual landfill grading of a site) was estimated and that acreage was multiplied by the composite unit cost of $91,000/acre, $93,000/acre, and $88,000/acre, respectively depending on the average haul distance from the center of landfill to the source of protective cover and drainage layer materials.

Line Item 29 – Groundwater Underdrain Drainage Pipes – Line Item 29 estimated the linear footage of underdrain interceptors and lateral pipes used to capture and convey groundwater from below the footprint of the landfill to areas downgradient of the landfill to the ES/SWM Pond. The unit cost for the Groundwater Underdrain Pipes was based on estimates for schedule 120 PVC pipe from previous experience on similar projects. The total cost per acre for these projects was used to develop a typical cost per acre to use for all landfill alternatives. The length of pipe estimated for each project was multiplied by its cost per linear foot and then divided by the area of the landfill in acres. This unit cost of $6,000 per acre was multiplied by the estimated conceptual landfill liner acreage to calculate a cost for Line Item 29.

Line Item 30 – Leachate Collection System Drainage Pipes – Line Item 30 estimated the linear footage of leachate collection system interceptors and lateral pipes used to convey water that infiltrates through the landfilled CCR material away from the landfill liner system and to the Leachate Pond. The unit cost for the Leachate Collection System Drainage Pipes was based on estimates for schedule 120 PVC pipe from previous experience on similar projects. The total cost per acre was calculated by multiplying the length of pipe estimated for each project by its cost per linear foot and then dividing that sum by the area of the conceptual landfill. This calculation was used to develop a typical cost per acre to use for all landfill alternatives. This unit cost of $15,000 per acre was multiplied by the estimated conceptual landfill liner acreage to calculate a cost for Line Item 30.

Line Items 31-32 – Large/Medium ES/SWM Pond and Leachate Pond – Earthwork and Liner System (~35/~20 acre-ft) – Multiple components were included in the development of the total unit costs used in Line Items 31 and 32. The unit cost of the medium pond was developed by scaling down the cost of the large pond with a ratio based on the ponds' volumes (20 acre-ft/35 acre-ft). Based on previous construction cost estimating experience on similar projects, these components include:

- Excavation and loading, hauling-1 mile round trip, hauling-3 mile round trip, spreading and compacting, rock blasting (emergency spillway), riser structure and dewatering pipe, 12" prepared subgrade, pond anchor trench. For containment in the leachate pond: 60-mil LLDPE geomembrane over the entire pond, cushion geotextile, 4" fabric form (FF) lining on side slopes, 8" FF lining in pond bottom. Pipe penetration seal (boot), mechanical pump system, electrical pump system, structural pump system, and leachate force main to pump leachate to a separate leachate treatment facility.

The use of the large or medium ponds depended on the layout and existing topography for an alternative. The cost for Line Items 31 and 32 was calculated by multiplying the unit cost of $3,000,000/pond and $2,000,000/pond, respectively, by the number of ponds to be used at a site.

For off-site CCR disposal alternatives that would require leachate collection and treatment (e.g. Lee Bottom) construction of a separate leachate treatment system local to the disposal facility site would likely be required. Costs for this leachate treatment system at offsite CCR disposal locations would likely be more expensive, but have not been included in this analysis.

Line Items 33-34 –Final Cover System – 2 or 4 Mile Round Trip (12 inches clay, 12 inches topsoil) – Multiple components were included in the development of the total unit costs used in Line Items 33 and 34. These components include:

- Excavating,

- 2 or 4 mile round trip (hauling distance determined by measuring from middle of landfill to borrow sites),

- spreading,

- compacting, and

- seeding of vegetative layer.

The difference between Line Items 33-34 is the estimated average hauling distance from the center of the landfill to identified potential borrow sites. In order to calculate a cost for Line Items 33 and 34, the total estimated acreage of the landfill footprint was multiplied by the composite unit cost of $29,000/acre and $33,000/acre, respectively, in order to determine the cost of placing final cover on the landfill.

Line Item 35 – Barge Loading Facility – Fenner Dunlop Conveyor Belting has provided a price quote that states that a barge loading facility with the capacity to handle the full CCR production rate of 910,000 CY per year would be approximately $14,200,000. This includes facility and site construction costs of ~$8.3 million and ~$5.9 million, respectively. This loading facility would be required for any alternative that has barging as a mode of transportation and would be constructed on the Ohio River at or near the TC Station.

In order to calculate a cost for Line Item 35, the unit cost of $8,300,000 was multiplied by one for any alternative using barge transportation. These costs are calculated on a 2014 dollar basis.

Line Item 36 – Barge Unloading Facility – Fenner Dunlop Conveyor Belting has provided a price quote that states that a barge unloading facility with the capacity to handle the full CCR production rate of 910,000 CY per year would be approximately $16,100,000. This includes facility and site construction costs of ~$9.97 million and ~$6.15 million, respectively. This unloading facility would be required for any alternative that has barging as a mode of transportation. The loading facility would be constructed on the Ohio River at or near the designated alternative's disposal facility.

In order to calculate a cost for Line Item 36, the unit cost of $16,100,000 was multiplied by one for any alternative using barge transportation. These costs are calculated on a 2014 dollar basis.

Line Item 37 – Ancillary Costs (Critical Spares and Office/Warehouse Space) – Fenner Dunlop Conveyor Belting has provided a price quote that states that ancillary costs for barge transportation would be approximately $1,600,000. This unit cost includes items related to support facilities for employees consisting of office space, warehouse space, and/or maintenance supplies storage space, as well as spares for critical components in case of the need for replacement.

In order to calculate a cost for Line Item 37, the unit cost of $1,600,000 was multiplied by one for any alternative using barge transportation. These costs are calculated on a 2014 dollar basis.

Line Item 38 – Additional Capital Costs – A number of components are considered to develop the total unit cost for Line Item 38. These components include:

-LG&E Overheads and Engineering Support during design and construction;

-Intermediate Cover and Benches;

-QA/QC (Subgrade, Liner, Final Cover System); and

-Borrow Area Roads and On-Landfill Haul Roads.

These individual line item costs are Lump Sum unit costs that vary between case studies. As discussed in Appendix III.B-1, the Ravine B case study has been analyzed and designed beyond the conceptual design done for the case studies included in this Supplement to the Alternatives Analysis. Capital and operating cost estimates have been prepared for Ravine B relating to the common additional capital and operating costs for landfill alternatives and are used to estimate the same component costs at other case study alternatives on an order of magnitude basis. Engineering judgment was used to compare each of the case studies vs. Ravine B and assign an "Order of Magnitude" multiplier indicating whether the cost would be similar to, (i.e. Order of Magnitude = 1.0), or some multiple of, the estimated cost of that particular line item in Ravine B (i.e. Order of Magnitude = 0.5 or 2.0). The "Order of Magnitude" was then multiplied by the total unit cost estimated in the Ravine B detailed capital cost estimate to develop Lump Sum Unit Costs of each component above for the case studies. Support Document III.D-1-17 describes how each case study was compared to Ravine B to determine an assumed "Order of Magnitude" multiplier for each line item. Table III.D-1-17-1 is included in Support Document III.D-1-17 and lists each of the above components, their assumed "Order of Magnitude" and Lump Sum unit costs estimated for the Ravine B, Sterling Ventures, Lee Bottom, and Valley View case studies. These costs are calculated on a 2013 dollar basis.

Operations and Maintenance (O&M) Costs

Line Items 39-41 – Hauling – 1, 2, or 3 Mile Round Trip (22 CY on landfill/private road) – After CCR material reaches the pipe conveyor termination point or barge unloading facility, it must be hauled via truck in order to be placed in the CCR disposal facility. Line Items 39-41 quantify a cost by multiplying the unit cost of $2.56/CY, $3.46/CY, and $4.19/CY, respectively, for distance hauled by the total volume of CCR material to be stored in the disposal facility. The difference between Line Items 39-41 is the estimated hauling distance from the conveyor endpoint or unloading facility to the approximate centroid of the conceptual CCR disposal facility. Distance varies based on facility location and layout of

an alternative. It is important to note that the Sterling Ventures tipping fee proposal did not address handling costs for CCR materials that come off the pipe conveyor. If trucking or other transport is needed to move the CCR into the mine, it is assumed these costs would be in addition to the tipping fee.

Line Item 42 – Hauling – 30 Mile Round Trip (18 CY, 35 MPH avg – Line Item 42 calculates the cost to haul CCR material from the TC Station to an offsite, existing CCR disposal facility at Valley View MSW Landfill. Valley View MSW Landfill is approximately 15 miles away (30 mile round trip). The distance between the TC Station and the off-site landfill is too far for pipe conveyor transportation to be feasible, and there are no barge or nearby rail alternatives. As a result, CCR material would need to be trucked at a cost of $11.55/CY for a 30 mile round trip.

Line Item 42 quantifies a cost by multiplying the total volume of CCR material to be stored in the offsite disposal facility by the unit cost of $11.55/CY.

Line Item 43 – Offsite CCR Disposal - Tipping Fee – Line Item 43 includes the tipping fee to dispose of CCR material from the TC Station to an offsite facility. One of two separate facilities, Valley View MSW Landfill or Sterling Ventures Mine, can be used depending on the alternative. A price quote from Republic Services of KY, LLC states it would cost $21.20/ton to dispose CCR material at Valley View MSW Landfill and a letter from Sterling Ventures, LLC quotes $10.15/ton to dispose of CCR material at Sterling Ventures Mine. It is important to note that tipping fees are subject to increases for new regulatory requirements and other changes in circumstances.

Line Item 43 quantifies a cost by multiplying the unit cost of either $21.20/ton or $10.15/ton, depending on the location of offsite CCR disposal.

Line Item 44 – Pipe Conveyor Cost of Operation – Beumer Group has provided a price quote that states that the pipe conveyor cost of operation would be $0.20/CY. This operational cost was based on the conceptual pipe conveyor routes included in the Line Items 11 through 13. For the purpose of this cost analysis it was assumed that all pipe conveyor routes will have similar cost of operation. The unit cost includes operation and power costs for an average length conveyor utilizing a reasonable cost per kilowatt hour. The price quoted by Beumer Group, and therefore this unit cost does not include salaries of people assigned to operate the conveyor.

In order to calculate a cost for the Line Item 44, the total volume of CCR material to be stored in the CCR disposal facility was multiplied by the unit cost of $0.20/CY to operate the pipe conveyor.

Line Item 45 – Barge Loading and Unloading Operations Cost – Fenner Dunlop Conveyor Belting has provided a price quote that includes the costs involved in managing and operating the barge loading and unloading facilities, including the estimated price to physically place the material onto the barge at the loading facility, and pick it up at the unloading facility.

To calculate the cost for Line Item 45, the unit cost of $1,300,000/year is multiplied by the number of years that barge transport of CCR material is anticipated for an alternative. These costs are calculated on a 2014 dollar basis.

Line Item 46 – Barge Transportation Costs – LG&E provided a price quote from a confidential source that includes the cost involved to physically transport the CCR material via barge. It is assumed that this unit cost includes labor, maintenance, and supplies to operate the push boat for the barges.

To calculate the cost for Line Item 46, the unit cost, which varies based on distance from TC Station to the alternative ($2.24/ton for Lee Bottom Landfill and $2.61/ton for Sterling Ventures Mine), is multiplied by the total amount of material to be disposed of at the CCR Disposal facility.

Line Item 47 – Additional O&M Costs – A number of components are considered to develop the total unit cost for Line Item 47. These components include:

-CCR Placement and Compaction, Survey of CCR Placement, and QA/QC of CCR Placement and Compaction;

-Cleanout/Maintenance of Haul Road, Sediment Basin and Leachate Pond, Leachate Pump Station O&M, Leachate System and Underdrain System, and Landfill Maintenance; and

-Dust Control.

These individual line item costs are Lump Sum unit costs that vary between case studies. As discussed in Appendix III.B-1, the Ravine B case study has been analyzed and designed beyond the conceptual design done for the case studies included in this Supplement to the Alternatives Analysis. Engineering judgment was used to compare each of the case studies vs. Ravine B and assign an "Order of Magnitude" multiplier indicating whether the cost would be similar to, (i.e. Order of Magnitude = 1.0), or some multiple of, the estimated cost of that particular line item in Ravine B (i.e. Order of Magnitude = 0.5 or 2.0). The "Order of Magnitude" was then multiplied by the total unit cost estimated in the Ravine B detailed O&M cost estimate to develop Lump Sum Unit Costs of each line item above for the case studies. Support Document III.D-1-17 describes how each case study was compared to Ravine B to determine an assumed "Order of Magnitude" multiplier for each line item. Table III.D-1-17-1 is included in Support Document III.D-1-17 and lists each of the above line items, their assumed "Order of Magnitude" and Lump Sum unit costs estimated for the Ravine B, Sterling Ventures, Lee Bottom, and Valley View case studies. These costs are calculated on a 2013 dollar basis.

SECTION 5: EXAMPLE OF LINE ITEM TOTAL COST DEVELOPMENT

After each Line Item's unit cost was developed and the magnitude (unit quantity) of each was quantified, the total cost for each Line Item for a particular alternative was determined by multiplying the unit cost by the unit quantity. For certain Line Items (i.e. Environmental Stream/Wetland Mitigation, Cemetery Relocation, Cultural Resources), costs were calculated individually on a case-by-case basis when the unit cost was expected to vary. These costs were quantified on a per alternative basis, as the degree of impact was not uniform across all sites and could not be assigned unit cost consistent across all alternatives.

An example explanation of how a particular Line Item cost is developed from the unit cost and unit quantity is provided below:

Example Line Item 2 – Clearing, Grubbing, and Site Preparation at the Sterling Ventures Mine Alternative.

Unit Cost Development:

The unit cost of $17,000 per acre consisted of two parts: "Cut and Chip Trees" and "Grub Stumps and Remove." Each of these costs were found in the *2012 RS Means Heavy Construction Cost Data* book at $14,600/acre and $7,525/acre, respectively. When multiplying the unit cost by 0.76 for the Frankfort, KY location factor (explained in Section 2.2), they become $11,111/acre for "Cut and Chip Trees" and $5,727/acre for "Grub Stumps and Remove." This totals to $16,838/acre, which was then rounded to $17,000/acre for ease of use.

Unit Quantity Development:

The quantity for Clearing, Grubbing, and Site Preparation was developed by measuring the number of forested acres assumed to be disturbed due to construction of the project. For the Sterling Ventures Mine Alternative, the only land disturbance assumed is due to construction of the pipe conveyor, haul road, and barge unloading facility. A conceptual impact boundary was developed based on a 1000 foot wide transportation corridor along the conceptual route for the pipe conveyor and haul road. The corridor is based on a conservative approximation of the limits of earthwork cut/fills required to construct a haul road and pipe conveyor system. The total forested acreage, defined as any area observed to have tree cover, within the impact boundary was calculated using USGS mapping. This was determined to be 290 acres.

290 acres multiplied by the unit cost of $17,000/acre comes to $4,930,000, which is the total cost for Line Item 2-Clearing, Grubbing, and Site Preparation in the Sterling Ventures Mine Alternative.

TRIMBLE COUNTY GENERATING STATION LANDFILL PROJECT
SUPPLEMENT TO ALTERNATIVES ANALYSIS
TABLE APPENDIX III.D-1 - UNIT COST DEVELOPMENT[1,2,3]

		Unit Cost ($)	Unit	Source	Source Support Document	RS Means Item Number	Original Cost ($)	Original Unit	Trimble, KY Adjusted Cost ($)	Adjusted Unit	Adjustment Equation
CAPITAL COSTS											
	General Project / Permitting / Infrastructure Cost Impacts										
1	Property Acquisition	$ 12,000	Acre	LG&E Supplied Estimate	N/A	N/A	-	-	-	-	N/A
2	Clearing, Grubbing, and Site Preparation	$ 17,000	Acre	See Below	See Below	See Below	-	-	16,837	Acre	Sum of Sub-Items
	Cut and Chip Trees	*$ 11,111*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.11.10.10.0300*	*14,600*	*Acre*	*11,111*	*Acre*	*N/A*
	Grub Stumps and Remove	*$ 5,727*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.11.10.10.0350*	*7,525*	*Acre*	*5,727*	*Acre*	*N/A*
3	Large Utility Line Relocation	$ 880	LF	Inflated LG&E Supplied Estimate - Scaled from 90% TC Construction Estimate	Support Document III.D-1-2	N/A	5,954,000	Lump Sum	872	LF	$5,954,000 / 6,825 LF
4	Fencing	$ 50	LF	2012 RS Means Heavy Construction Cost Data	Support Document III.D-1-3	*See Support Document III.D-1-3*	-	-	-	-	N/A
5	Environmental Wetland Mitigation (cost based on adjusted mitigation units)	Varies	Acre	Kentucky Department of Fish and Wildlife Resources Fee In-Lieu Of Program	Support Document III.D-1-4	N/A	-	-	-	-	N/A
6	Environmental Stream Mitigation (cost based on adjusted mitigation units)	Varies	LF	Kentucky Department of Fish and Wildlife Resources Fee In-Lieu Of Program	Support Document III.D-1-4	N/A	-	-	-	-	N/A
7	Cultural Resources (Potential Phase III data recovery)	Varies	EA	GAI Cost Estimate	Support Document III.D-1-5	N/A	-	-	-	-	N/A
8	Indiana Bat Mitigation[4]	$ 5,338	Acre	GAI Cost Estimate	Support Document III.D-1-4	N/A	5,338	Acre	5,338	Acre	($4,575 + $6,100) / 2
9	Road Relocation (County Road)	$ 350	LF	GAI Cost Estimate	Support Document III.D-1-6	N/A	303	LF	350	LF	Round up
10	Road Relocation (State Road)	$ 400	LF	GAI Cost Estimate	Support Document III.D-1-6	N/A	350	LF	400	LF	Round up
	CCR Transportation										
11	Pipe Conveyor Transport (similar to North Ridge Top path at Ravine B)	$ 2,150	LF	Recent Vendor/Contractor Supplied Estimate	Support Document III.D-1-7	N/A	-	-	-	-	N/A
12	Pipe Conveyor Transport (similar to Ogden Ridge Road path at Ravine B)	$ 2,425	LF	Recent Vendor/Contractor Supplied Estimate	Support Document III.D-1-7	N/A	-	-	-	-	N/A
13	Pipe Conveyor Transport (similar to South Ridge Top path at Ravine B)	$ 3,125	LF	Recent Vendor/Contractor Supplied Estimate	Support Document III.D-1-7	N/A	-	-	-	-	N/A
14	Transfer Station	$ 250,000	EA	Recent Vendor/Contractor Supplied Estimate	Support Document III.D-1-8	N/A	-	-	-	-	N/A
15	Haul Road - Off Landfill	$ 1,600	LF	Scaled from Recent Haul Road Construction Package Cost Estimate	Support Document III.D-1-9	N/A	10,487,982	Lump Sum	1,565	LF	$10,487,982 / 6,700 LF
16	Bridge - Large (36 FT high, 440 FT long, 60 FT wide)	$ 4,000,000	EA	Scaled from Recent Haul Road Construction Package Cost Estimate	Support Document III.D-1-10	N/A	3,965,000	EA	4,000,000	EA	Round up
17	Bridge - Medium (200 FT long, 60 FT wide)	$ 1,750,000	EA	Scaled from Recent Haul Road Construction Package Cost Estimate	Support Document III.D-1-11	N/A	145	SF	1740000	EA	$/SF * SF
	Landfill Preparation										
18	Perimeter Collection Channel - Fabric Form, 6-10' Bottom Width	$ 75.00	LF	Recent Construction Bid Price or Supplier Quote on Similar Project	N/A	N/A	-	-	-	-	N/A
19	Upslope Drainage Diversion Channel - Fabric Form, 1-5' Bottom Width	$ 50.00	LF	Recent Construction Bid Price or Supplier Quote on Similar Project	N/A	N/A	-	-	-	-	N/A
20	Subgrade Preparation - General Earthwork - Soil Inside Footprint (3000 ft R.T.)	$ 5.65	CY	2012 RS Means Heavy Construction Cost Data	Support Document III.D-1-12	*See Support Document III.D-1-12*	7.42	CY	5.65	CY	N/A
21	Subgrade Preparation - General Earthwork - Rock Blasting (3000 ft R.T.)	$ 21.72	CY	2012 RS Means Heavy Construction Cost Data	Support Document III.D-1-12	*See Support Document III.D-1-12*	28.54	CY	21.72	CY	N/A
22	Subgrade Preparation - Borrow or Spoiling Excess Material - Soil - 1/2 Mile RT	$ 5.65	CY	2012 RS Means Heavy Construction Cost Data	Support Document III.D-1-12	*See Support Document III.D-1-12*	7.42	CY	5.65	CY	N/A
23	Subgrade Preparation - Borrow or Spoiling Excess Material - Soil - 1 Mile RT	$ 5.94	CY	2012 RS Means Heavy Construction Cost Data	Support Document III.D-1-12	*See Support Document III.D-1-12*	7.81	CY	5.94	CY	N/A
24	Subgrade Preparation - Borrow or Spoiling Excess Material - Soil - 2 Miles RT	$ 6.84	CY	2012 RS Means Heavy Construction Cost Data	Support Document III.D-1-12	*See Support Document III.D-1-12*	8.99	CY	6.84	CY	N/A
25	Subgrade Preparation - Borrow or Spoiling Excess Material - Soil - 4 Miles RT	$ 8.36	CY	2012 RS Means Heavy Construction Cost Data	Support Document III.D-1-12	*See Support Document III.D-1-12*	10.99	CY	8.36	CY	N/A
26	Landfill Composite Liner System - 0.5 mi Round Trip (RT) Protective Cover/4 mi RT Drainage Layer	$ 91,000	Acre	See Below	See Below	See Below	-	-	90,682	Acre	Sum of Sub-Items-rounded to $91,000
	Protective Cover - 24 Inch Layer (Trimble CCRs)	***$ 17,139***	***Acre***	***See Below***	***See Below***	***See Below***	-	-	***17,139***	***Acre***	***Sum of Sub-Items***
	Loading	*$ 4,543*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.16.42.1350*	*1.85*	*CY*	*4,543*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Hauling Protective Cover Layer - 0.5 Mile Round Trip	*$ 7,317*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.20.5090*	*2.98*	*CY*	*7,317*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Spreading	*$ 5,279*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.17.0020*	*2.15*	*CY*	*5,279*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Leachate Collection Drainage Layer - 12 Inch Layer (Trimble Bottom Ash)	***$ 12,830***	***Acre***	***See Below***	***See Below***	***See Below***	-	-	***12,830***	***Acre***	***Sum of Sub-Items***
	Loading	*$ 2,271*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.16.42.1350*	*1.85*	*CY*	*2,271*	*Acre*	*$/CY * 1FT/3FT * 43560CF/9SF*
	Hauling Drainage Layer - 4.0 Mile Round Trip	*$ 7,919*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.20.5120*	*6.45*	*CY*	*7,919*	*Acre*	*$/CY * 1FT/3FT * 43560CF/9SF*
	Spreading	*$ 2,640*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.17.0020*	*2.15*	*CY*	*2,640*	*Acre*	*$/CY * 1FT/3FT * 43560CF/9SF*
	10 OZ/SY Cushion Geotextile	***$ 4,985***	***Acre***	***GAI Cost Estimate from Past Project***	***Support Document III.D-1-13***	***N/A***	*1.03*	*SY*	***4,985***	***Acre***	*$/SY * 1SY/9SF * 43560SF/Acre*
	60-mil LLDPE Geomembrane	***$ 32,670***	***Acre***	***GAI Cost Estimate from Past Project***	***Support Document III.D-1-13***	***N/A***	*6.75*	*SY*	***32,670***	***Acre***	*$/SY * 1SY/9SF * 43560SF/Acre*
	Recompacted Soil Liner (RSL) - 24 Inch Layer	***$ 23,057***	***Acre***	***See Below***	***See Below***	***See Below***	-	-	***23,057***	***Acre***	***Sum of Sub-Items***
	Excavation & Loading	*$ 4,076*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.16.42.0300*	*1.66*	*CY*	*4,076*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Hauling RSL Layer - 1.0 Mile Round Trip	*$ 11,172*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.20.5110*	*4.55*	*CY*	*11,172*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Spreading	*$ 5,279*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.17.0020*	*2.15*	*CY*	*5,279*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Compacting	*$ 1,891*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.23.5720*	*0.77*	*CY*	*1,891*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Compacting	*$ 638*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.23.5060*	*0.26*	*CY*	*638*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
27	Landfill Composite Liner System - 1.5 mi RT Protective Cover/4 mi RT Drainage Layer	$ 93,000	Acre	See Below	See Below	See Below	-	-	93,088	Acre	Sum of Sub-Items-rounded to $93,000

		Unit Cost ($)	Unit	Source	Source Support Document	RS Means Item Number	Original Cost ($)	Original Unit	Trimble, KY Adjusted Cost ($)	Adjusted Unit	Adjustment Equation
CAPITAL COSTS											
	Protective Cover - 24 Inch Layer (Trimble CCRs)	*$ 19,546*	*Acre*	*See Below*	*See Below*	*See Below*	-	-	*19,546*	*Acre*	*Sum of Sub-Items*
	Loading	*$ 4,543*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.16.42.1350*	*1.85*	*CY*	*4,543*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Hauling Protective Cover Layer - 1.5 Mile Round Trip	*$ 9,724*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.20.5090*	*3.96*	*CY*	*9,724*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Spreading	*$ 5,279*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.17.0020*	*2.15*	*CY*	*5,279*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Leachate Collection Drainage Layer - 12 Inch Layer (Trimble Bottom Ash)	*$ 12,830*	*Acre*	*See Below*	*See Below*	*See Below*	-	-	*12,830*	*Acre*	*Sum of Sub-Items*
	Loading	*$ 2,271*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.16.42.1350*	*1.85*	*CY*	*2,271*	*Acre*	*$/CY * 1FT/3FT * 43560CF/9SF*
	Hauling Drainage Layer - 4.0 Mile Round Trip	*$ 7,919*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.20.5120*	*6.45*	*CY*	*7,919*	*Acre*	*$/CY * 1FT/3FT * 43560CF/9SF*
	Spreading	*$ 2,640*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.17.0020*	*2.15*	*CY*	*2,640*	*Acre*	*$/CY * 1FT/3FT * 43560CF/9SF*
	10 OZ/SY Cushion Geotextile	*$ 4,985*	*Acre*	*GAI Cost Estimate from Past Project*	*Support Document III.D-1-13*	*N/A*	*1.03*	*SY*	*4,985*	*Acre*	*$/SY * 1SY/9SF * 43560SF/Acre*
	60-mil LLDPE Geomembrane	*$ 32,670*	*Acre*	*GAI Cost Estimate from Past Project*	*Support Document III.D-1-13*	*N/A*	*6.75*	*SY*	*32,670*	*Acre*	*$/SY * 1SY/9SF * 43560SF/Acre*
	Recompacted Soil Liner (RSL) - 24 Inch Layer	*$ 23,057*	*Acre*	*See Below*	*See Below*	*See Below*	-	-	*23,057*	*Acre*	*Sum of Sub-Items*
	Excavation & Loading	*$ 4,076*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.16.42.0300*	*1.66*	*CY*	*4,076*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Hauling RSL Layer - 2.0 Mile Round Trip	*$ 11,172*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.20.5110*	*4.55*	*CY*	*11,172*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Spreading	*$ 5,279*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.17.0020*	*2.15*	*CY*	*5,279*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Compacting	*$ 1,891*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.23.5720*	*0.77*	*CY*	*1,891*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Compacting	*$ 638*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.23.5060*	*0.26*	*CY*	*638*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
28	Landfill Composite Liner System - 0.5 mi RT Protective Cover/2 mi RT Drainage Layer	$ 88,000	Acre	See Below	See Below	See Below	-	-	88,349	Acre	Sum of Sub-Items-rounded to $88,000
	Protective Cover - 24 Inch Layer (Trimble CCRs)	*$ 17,139*	*Acre*	*See Below*	*See Below*	*See Below*	-	-	*17,139*	*Acre*	*Sum of Sub-Items*
	Loading	*$ 4,543*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.16.42.1350*	*1.85*	*CY*	*4,543*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Hauling Protective Cover Layer - 0.5 Mile Round Trip	*$ 7,317*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.20.5090*	*2.98*	*CY*	*7,317*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Spreading	*$ 5,279*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.17.0020*	*2.15*	*CY*	*5,279*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Leachate Collection Drainage Layer - 12 Inch Layer (Trimble Bottom Ash)	*$ 10,497*	*Acre*	*See Below*	*See Below*	*See Below*	-	-	*10,497*	*Acre*	*Sum of Sub-Items*
	Loading	*$ 2,271*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.16.42.1350*	*1.85*	*CY*	*2,271*	*Acre*	*$/CY * 1FT/3FT * 43560CF/9SF*
	Hauling Drainage Layer - 2.0 Mile Round Trip	*$ 5,586*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.20.5110*	*4.55*	*CY*	*5,586*	*Acre*	*$/CY * 1FT/3FT * 43560CF/9SF*
	Spreading	*$ 2,640*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.17.0020*	*2.15*	*CY*	*2,640*	*Acre*	*$/CY * 1FT/3FT * 43560CF/9SF*
	10 OZ/SY Cushion Geotextile	*$ 4,985*	*Acre*	*GAI Cost Estimate from Past Project*	*Support Document III.D-1-13*	*N/A*	*1.03*	*SY*	*4,985*	*Acre*	*$/SY * 1SY/9SF * 43560SF/Acre*
	60-mil LLDPE Geomembrane	*$ 32,670*	*Acre*	*GAI Cost Estimate from Past Project*	*Support Document III.D-1-13*	*N/A*	*6.75*	*SY*	*32,670*	*Acre*	*$/SY * 1SY/9SF * 43560SF/Acre*
	Recompacted Soil Liner (RSL) - 24 Inch Layer	*$ 23,057*	*Acre*	*See Below*	*See Below*	*See Below*	-	-	*23,057*	*Acre*	*Sum of Sub-Items*
	Excavation & Loading	*$ 4,076*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.16.42.0300*	*1.66*	*CY*	*4,076*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Hauling RSL Layer - 2.0 Mile Round Trip	*$ 11,172*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.20.5110*	*4.55*	*CY*	*11,172*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Spreading	*$ 5,279*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.17.0020*	*2.15*	*CY*	*5,279*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Compacting	*$ 1,891*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.23.5720*	*0.77*	*CY*	*1,891*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Compacting	*$ 638*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.23.5060*	*0.26*	*CY*	*638*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
29	Groundwater Underdrain Drainage Pipes	$ 6,000	Acre	GAI Cost Estimate	Support Document III.D-1-14	N/A	-	-	-	-	N/A
30	Leachate Collection System Drainage Pipes	$ 15,000	Acre	GAI Cost Estimate	Support Document III.D-1-14	N/A	-	-	-	-	N/A
	Erosion and Sediment / Stormwater Management (ES/SWM) and Leachate Ponds[5]										
31	Large ES/SWM Pond and Leachate Pond - Earthwork and Liner System (~35 acre-ft)	$ 3,000,000	EA	GAI Cost Estimate	Support Document III.D-1-15	N/A	-	-	-	-	N/A
32	Medium ES/SWM Pond and Leachate Pond - Earthwork and Liner System (~20 acre-ft)	$ 2,000,000	EA	Scaled from GAI Cost Estimate	Support Document III.D-1-15	N/A	1,847,253	EA	2,000,000		Round up
	Landfill Cap Cover System										
33	Final Cover System - 2 Mile RT (12 Inches Clay; 12 Inches Topsoil)	$ 29,000	Acre	See Below	Support Document III.D-1-1	See Below	-	-	28,233	Acre	Sum of Sub-Items
	Seeding of Vegetative Layer	*$ 3,507*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*32.92.19.14.4600*	*80.50*	*M.S.F*	*3,507*	*Acre*	*$ / 1000 S.F * 43560*
	Excavating	*$ 6,532*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.16.42.0300*	*2.66*	*CY*	*6,532*	*Acre*	*$/CY * 1CY/27CF * 2FT * 43560AC*
	2.0 Mile RT	*$ 11,172*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.20.5110*	*4.55*	*CY*	*11,172*	*Acre*	*$/CY * 1CY/27CF * 2FT * 43560AC*
	Spreading	*$ 5,279*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.17.0020*	*2.15*	*CY*	*5,279*	*Acre*	*$/CY * 1CY/27CF * 2FT * 43560AC*
	Compacting	*$ 1,743*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.23.5040*	*0.71*	*CY*	*1,743*	*Acre*	*$/CY * 1CY/27CF * 2FT * 43560AC*
34	Final Cover System - 4 Mile RT (12 Inches Clay; 12 Inches Topsoil)	$ 33,000	Acre	See Below	Support Document III.D-1-1	See Below	-	-	32,899	Acre	Sum of Sub-Items
	Seeding of Vegetative Layer	*$ 3,507*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*32.92.19.14.4600*	*80.50*	*M.S.F*	*3,507*	*Acre*	*$ / 1000 S.F * 43560*
	Excavating	*$ 6,532*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.16.42.0300*	*2.66*	*CY*	*6,532*	*Acre*	*$/CY * 1CY/27CF * 2FT * 43560AC*
	4.0 Mile RT	*$ 15,838*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.20.5120*	*6.45*	*CY*	*15,838*	*Acre*	*$/CY * 2FT/3FT * 43560CF/9SF*
	Spreading	*$ 5,279*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.17.0020*	*2.15*	*CY*	*5,279*	*Acre*	*$/CY * 1CY/27CF * 2FT * 43560AC*
	Compacting	*$ 1,743*	*Acre*	*2012 RS Means Heavy Construction Cost Data*	*Support Document III.D-1-1*	*31.23.23.23.5040*	*0.71*	*CY*	*1,743*	*Acre*	*$/CY * 1CY/27CF * 2FT * 43560AC*
	Barge Transport										

TRIMBLE COUNTY GENERATING STATION LANDFILL PROJECT
SUPPLEMENT TO ALTERNATIVES ANALYSIS
TABLE APPENDIX III.D-1 - UNIT COST DEVELOPMENT[1,2,3]

		Unit Cost ($)	Unit	Source	Source Support Document	RS Means Item Number	Original Cost ($)	Original Unit	Trimble, KY Adjusted Cost ($)	Adjusted Unit	Adjustment Equation
CAPITAL COSTS											
35	Barge Loading Facility	$ 14,200,000	EA	Recent Vendor/Contractor Supplied Estimate	Support Document III.D-1-16	N/A	-	-	-	-	N/A
36	Barge Unloading Facility	$ 16,100,000	EA	Recent Vendor/Contractor Supplied Estimate	Support Document III.D-1-16	N/A	-	-	-	-	N/A
37	Ancillary Costs (Critical Spares and Office/Warehouse Space)	$ 1,600,000	EA	Recent Vendor/Contractor Supplied Estimate	Support Document III.D-1-16	N/A	-	-	-	-	N/A
	Additional Capital Costs										
38	Additional Capital Costs[6]	Varies	LUMP	See Below	Support Document III.D-1-17	-	-	-	-	-	
	LG&E Overheads and Engineering Support	*Varies*	*LUMP*	*LG&E Supplied Estimate*	*Support Document III.D-1-17*	-	-	-	-	-	Sum of Sub-Items
	Intermediate Cover and Benches	*Varies*	*LUMP*	*GAI Cost Estimate*	*Support Document III.D-1-17*	-	-	-	-	-	*N/A*
	QA/QC (Subgrade, Liner, Final Cover System)	*Varies*	*LUMP*	*GAI Cost Estimate*	*Support Document III.D-1-17*	-	-	-	-	-	*N/A*
	Borrow Area Haul Roads and On-Landfill Haul Roads	*Varies*	*LUMP*	*GAI Cost Estimate*	*Support Document III.D-1-17*	-	-	-	-	-	*N/A*
OPERATION AND MAINTENANCE (O&M) COSTS											
	Landfill / Pipe Conveyor Operating Costs										
39	Hauling - 1 Mile Round Trip (22 CY on landfill/private road)	$ 2.56	CY	2012 RS Means Heavy Construction Cost Data	*Support Document III.D-1-1*	31.23.23.20.5100	3.37	CY	2.56	CY	N/A
40	Hauling - 2 Mile Round Trip (22 CY on landfill/private road)	$ 3.46	CY	2012 RS Means Heavy Construction Cost Data	*Support Document III.D-1-1*	31.23.23.20.5110	4.55	CY	3.46	CY	N/A
41	Hauling - 3 Mile Round Trip (22 CY on landfill/private road)	$ 4.19	CY	2012 RS Means Heavy Construction Cost Data	*Support Document III.D-1-1*	31.23.23.20.5110/5120	5.50	CY	4.19	CY	N/A
42	Hauling - 30 Mile Round Trip (18 CY, 35 MPH avg)	$ 11.55	CY	2012 RS Means Heavy Construction Cost Data	*Support Document III.D-1-1*	31.23.23.20.9670/9704	11.55	CY	11.55	CY	N/A
43	Offsite CCR Disposal - Tipping Fee[7]	Varies	TON	Recent Vendor/Contractor Supplied Estimate	Support Document III.D-1-18	N/A	-	-	-	-	N/A
44	Pipe Conveyor Cost of Operation	$ 0.20	CY	Recent Vendor/Contractor Supplied Estimate	Support Document III.D-1-19	N/A	-	-	-	-	N/A
	Barge Transport										
45	Barge Loading and Unloading Operations Costs	$ 1,100,000	YR	Recent Vendor/Contractor Supplied Estimate	Support Document III.D-1-16	N/A	-	-	-	-	N/A
46	Barge Transportation Costs	Varies	TON	Confidential Source	N/A	N/A	-	-	-	-	N/A
	Additional O&M Costs										
47	Additional O&M Costs[6]	Varies	LUMP	See Below	Support Document III.D-1-17	-	-	-	-	-	
	CCR Placement, Compaction, Survey, and QA/QC	*Varies*	*LUMP*	*GAI Cost Estimate*	*Support Document III.D-1-17*	-	-	-	-	-	Sum of Sub-Items
	Cleanout / Maintenance (Haul Roads, Ponds, LCS, Underdrain, and Landfill)	*Varies*	*LUMP*	*GAI Cost Estimate*	*Support Document III.D-1-17*	-	-	-	-	-	*N/A*
	Dust Control	*Varies*	*LUMP*	*GAI Cost Estimate*	*Support Document III.D-1-17*	-	-	-	-	-	*N/A*

NOTES:

1 Costs are for comparison of Site Alternatives only as described in Section III of the report. Contingencies were not applied except as noted in Appendix III.D-1.

2 Costs were developed including only line items which are anticipated to be significantly different between Site Alternatives. "Common Cost" items anticipated to be similar in cost for all Site Alternatives are not included (i.e. project management or the conditioning and treatment of CCR prior to transit from TC Station). Minor construction and operations costs are not included due to the conceptual nature of the design. Examples of these minor cost items include: minor utility line relocations, minor erosion and sedimentation/stormwater management controls, surface and groundwater testing, mowing.

3 Costs are calculated on 2012 dollar basis (except as noted in Appendix III.D-1). No inflation or discount rates included.

4 Assumes average cost ($5,338 per acre) for Indiana Bat Mitigation as described in Support Document III.D-1-4.

5 Does not include costs for leachate treatment or transport system. See Appendix III.D-1 for more information.

6 Additional Capital and O&M costs include costs previously omitted from (GAI 2014) Cost Analysis but added to the Case Study Analysis due to comparison of landfill vs. non-landfill (e.g. mine) alternatives. See Appendix III.D-1 for more information.

7 Cost varies with location of disposal. At Valley View, tipping fee is $21.20/ton. At Sterling Ventures Mine, tipping fee is $10.15/ton.

APPENDIX III.D-2.
Kentucky Public Service Commission Consideration of Least-Cost Alternatives in Issuing Certificates of Public Convenience and Necessity

APPENDIX III.D-2

KENTUCKY PUBLIC SERVICE COMMISSION CONSIDERATION OF LEAST-COST ALTERNATIVES IN ISSUING CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY

As a public utility, LG&E is regulated by the Kentucky Public Service Commission (KPSC) and must comply with the statutes contained in KRS Chapter 278, the KPSC's regulations, and LG&E's own tariffs. As such, LG&E is required to obtain a Certificate of Public Convenience and Necessity (CPCN) from the KPSC prior to construction of any plant, equipment, property, or facility related to the furnishing of electric utility services to the public, with certain exceptions. See KRS 278.020. KRS Chapter 278 provides the KPSC with exclusive jurisdiction over the regulation of utility rates and service. See KRS 278.040(2). Kentucky law provides that, for utility ratemaking, every utility may demand, collect and receive fair, just, and reasonable rates for the services rendered. KRS 278.030(1).

A fundamental principle considered by KPSC in reviewing an application for a CPCN is that the proposed project be the least, reasonable cost alternative and one that will not result in wasteful duplication. See Public Service Comm'n v. Continental Tel. Co., 692 S.W.2d 794, 799 (Ky. 1985) (noting that one of the important objectives considered by the KPSC is whether the proposed utility project will result the lowest possible cost to the ratepayers[1]). Wasteful duplication is defined as "an excess of capacity over need" and "an excessive investment in relation to productivity or efficiency, and an unnecessary multiplicity of physical properties." See Kentucky Utilities Co. v. Public Service Comm'n, 252 S.W.2d 885 (Ky. 1952). Accordingly, capital projects that require a substantially greater investment by the utility to achieve essentially the same results or purpose may not fulfill the KPSC requirement of being the least, reasonable cost alternative or could be deemed to be a wasteful duplication that would not qualify for a CPCN. See In the Matter of: Application of Kentucky Power Co. for Approval of Renewal Energy Purchase Agreement for Wind Energy Resources between Kentucky Power Company and FPL Illinois Wind LLC, Case No. 2009-00545 (Order entered June 28, 2010) (refusing to approve a CPCN for a wind purchase agreement that was not the least-cost alternative). In evaluating whether a proposed project is the least, reasonable cost alternative, the KPSC does not focus merely on initial capital costs, but rather, includes consideration of future operating and maintenance costs over the life of the project. In the Matter of: Application of Kentucky-American Water Company for a Certificate of Public Convenience and Necessity Authorizing Construction of the Northern Division Connection, Case No. 2012-0096 (Order entered February 28, 2013) (approving an alternative where lower O&M expenses would eventually erase any initial difference in capital cost from a lower capital cost alternative).

[1] The KPSC's focus on ensuring the lowest reasonable rates for utility customers is reflected in its implementing regulations related to integrated resource planning. See 807 KAR 5:058 (noting that the administrative regulation is intended to provide for "load forecasts and resource plans of the state's electric utilities to meet future demand with an adequate and reliable supply of electricity at the lowest possible cost for all customers within their service areas, and satisfy all related state and federal laws and regulations.").

In reviewing applications for CPCNs, the KPSC does not have jurisdiction over environmental compliance issues such as "whether or not the environmental equipment proposed . . . is sufficient for the issuance of necessary permits by other federal, state , or local agencies." In the Matter of: An Investigation of the East Kentucky Power Cooperative's Inc. Need for the Smith 1 Generating Facility, Case No. 2010-0238 (Order entered June 22, 2010). Rather, the KPSC's evaluation is "limited to whether there is a current need for [the project] and, if there is such a need, whether [the project] is the least costly option for meeting that need and the potential impact of [the project] on [utilities] rates and service." Id. Therefore, the fact that other objectives might be achieved by the utility by entering into a renewable energy agreement was not a consideration where the KPSC found the Wind Power contract was "neither needed nor least-cost when compared to the existing generating resources" of the utility. Case No. 2009-00545, Supra. While the KPSC is not precluded from considering other relevant factors beyond whether a proposed project is the least, reasonable cost alternative, consideration of other factors is the exception to the firmly held KPSC position that cost, reliability, and economic efficiency are the paramount considerations. In the Matter of: Application of Jessamine-South Elkhorn Water District for a Certificate of Public Convenience and Necessity to Construct and Finance a Waterworks Improvements Project, Case No. 2012-00470 (Order entered March 8, 2013) (citing six separate cases for the proposition that the KYPSC considers evidence regarding "effects of proposed facilities on adjacent landowners and the aesthetics of the surrounding area" in reviewing applications for CPCNs, but also stating that "aesthetic concerns" are not given "equal weight with other considerations" and that "quality and reliability," "economic efficiency," and "cost" remain the "paramount considerations.")

APPENDIX III.E-1.
Methods for Assessment of Environmental Impacts

APPENDIX III.E-1. METHODS FOR ASSESSMENT OF ENVIRONMENTAL IMPACTS

1. INTRODUCTION

As discussed in GAI (2014), aquatic ecosystems are a focus in identification of the Least Environmentally Damaging Practicable Alternative (LEDPA). Consequently, the expected impacts to streams and wetlands for each of the four case studies have been quantified using methods described in Sections 2 and 3 below.

In its evaluation, LG&E also has considered other categories of environmental impacts, especially those by which CCR disposal could most directly affect the public. In this Appendix, methods used to quantify or otherwise characterize the impacts are presented for the following categories.

- Threatened and endangered species (Section 4)
- Karst features (Section 5)
- Potential cultural or historic resources (Section 6)
- Cemeteries (Section 7)
- Air quality (Section 8)
- Public safety (Section 9)
- Quality of life including aesthetics and noise (Section 10)

2. STREAMS

The assessment of impacts to streams that would result from each case study alternative were determined by estimating the total cumulative linear feet of streams that are located within the respective approximated impact boundaries as reflected in the conceptual designs for the case study alternatives. The stream quantities were itemized by flow classification (perennial, intermittent, and ephemeral) when available (as further described below).

The impacts to streams resulting from the construction of the various case study alternatives was evaluated by one of two approaches. Streams within Ravine B have been evaluated for geomorphic stream quality and surveys have been performed to determine the length of each stream segment. Thus, the impact quantities could be determined with reasonable accuracy for the Ravine B case study using this empirical data based on field observations.

For the other case studies, desktop methods and data were utilized to estimate stream lengths and flow classification to determine the cumulative length of stream impacts. First, published stream data were obtained from the U.S. Geological Survey's National Hydrography Data set, which contains estimated perennial and intermittent stream location data based on historical field observations and/or other mapping techniques. Using geographical information systems (GIS) the estimated lengths for these perennial and intermittent streams were then calculated for a defined, estimated disturbance area or impact area for a case study. Secondly, ephemeral stream lengths are estimated using GIS techniques to

sketch streams onto maps based on topographic contour data, as well as the general upgradient area above intermittent streams. Ephemeral streams are added to GIS maps based on reviewing the maps for steep topographic contour gradients and professional experience with ephemeral stream locations in the study region, followed by calculating the ephemeral stream length estimates within the planned impact boundary. These methods utilize the best available published data in the absence of field studies at the various sites, which were not necessary for this screening-level analysis.

3. WETLANDS

The impacts to wetlands that would result from each case study alternative were determined by quantifying the total acreage of wetlands that are located, or anticipated to be present based on published data, within the respective approximated impact boundaries for each case study alternative. Wetlands in the Bluegrass Bioregion of Kentucky typically fall into the emergent, scrub shrub, or forested wetland classifications [United States (US) Fish and Wildlife Service (USFWS) classification system].

Similar to streams, the impacts to wetlands resulting from the construction of the various case study alternatives were essentially evaluated by one of two approaches. Wetlands within Ravine B have been evaluated in accordance with the US Army Corps of Engineers (USACE) Wetland Delineation Manual (1987) and surveyed to record the boundaries and determine the cover area of each wetland. Thus, the impact quantities could be determined with reasonable accuracy for the Ravine B case study using this empirical data based on field observations.

For the other case studies, desktop methods and data were utilized to estimate the presence and cover area of individual wetlands, and the cumulative total within a planned impact boundary. The National Wetland Inventory (NWI) geospatial data was accessed from public data sources (USFWS) and added to project GIS maps as a data layer for evaluation. The NWI maps are prepared by the USFWS from the analysis of high altitude imagery and wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery according to the USFWS. GIS operations are then utilized to estimate the total wetland cover area (in acres), by summing all individual wetlands within the given impact boundary. Ponds were not included as these are typically included with stream footage based on the original stream feature prior to the pond creation, if applicable. These methods utilize the best available published data in the absence of field studies at the various sites, which were not necessary for this screening-level analysis.

4. THREATENED AND ENDANGERED SPECIES

The impacts on threatened and endangered species were considered based on the construction and operational practices to be employed for each case study. Based on consultation with the USFWS – Kentucky Field Office staff concerning the Ravine B vicinity and immediate environs, these species are limited to the Indiana bat (federally endangered), the gray bat (federally endangered), the northern long-eared bat (federally proposed endangered), and running buffalo clover (federally endangered). A Biological Assessment addressing potential effects on these species for the Ravine B case study was initiated in the summer of 2013 and is currently in draft form.

The amount of forested land that would be cleared for landfill construction purposes was deemed to be the most feasible method for accounting for the most significant potential impacts on the listed bat species known to occur within this particular region of Kentucky and southern Indiana or surrounding regions. The determination of the acreage of forest clearing required for a specific case study accounts for potential adverse effects on the Indiana bat and northern long-eared bat through the loss of summer roosting habitat. GIS methods and aerial imagery were utilized to identify forested land and subsequently calculate the total acreage of forest clearing for each case study for comparison purposes. This allows a direct comparison of the various case studies using a measurable, reliable feature (forested acreage). The gray bat is less affected by tree clearing (in terms of direct or indirect effects) as this species is known to roost in caves year-round.

Two surveys for running buffalo clover were conducted within the Ravine B vicinity and portions of adjacent ravines in 2007 and 2013. Both surveys were negative for this plant species. No reliable indicator exists for determining the likelihood of this species to be present in a particular locale, other than the known suitable habitat, therefore no evaluation of the effect of the case studies outside of the Ravine B study area was performed for comparative evaluation purposes.

Habitat for eight endangered mussel species exists within the Ohio River and its watershed in Trimble County, however the mussel species are not expected to be affected by the case studies located in the Ravine B vicinity (due to no construction activity in or adjacent to the Ohio River or Corn Creek). Due the lack of available and specific location data on endangered mussels in or near the various case studies located in or near the Ohio River or adjacent tributaries, it is impractical to evaluate a particular case study alternative's impacts on endangered mussels that may exist within or near the Ohio River's banks or adjacent tributaries. In addition to Trimble County, seven species of endangered mussels are listed for Gallatin County, KY (site of Sterling Ventures Mine) and one mussel species is listed for Jefferson County, IN (site of Lee Bottom Landfill).

Finally, the bald eagle is also documented as being present in Trimble County by the USFWS. Bald eagles are delisted, but are still protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act. Potential removal or adverse effects on bald eagle habitat, typically located adjacent to the Ohio River if present, is not anticipated to be a significant impact as nests can be easily identifiable prior to construction and avoidance measures taken. Bald eagles have not been recorded recently in Gallatin County, KY based on information accessed at http://www.fws.gov/frankfort/EndangeredSpecies.html. Bald eagle nests have been recorded statewide in Indiana including Jefferson County based on information accessed at http://www.fws.gov/midwest/eagle/conservation/baeacounties.html.

5. KARST FEATURES

The existence or the potential for the existence of karst features at each case study location was assessed by reviewing available data, including previously developed geologic studies and site reconnaissance data where available, and published geologic reports and maps within the respective impact boundaries for each case study.

For the Ravine B case study, subsurface investigations and a detailed site reconnaissance were performed at various times for a number of prior studies. Therefore detailed site- specific information is available along with published maps detailing site geology and karst potential. As a result, the site geology and the presence of karst features have been well defined in the Ravine B vicinity. It has been found that most of the significant karst features within Ravine B are found in the upper half of the Saluda Dolomite (Saluda) which is the uppermost member of the Drakes Formation. The features generally occur as sinkholes on the exposed upper surface of the Saluda. The "Lime Cave" is also located within the upper half of the Saluda. The result is that most of the significant karst features on site occur in a narrow band that occurs at the outcrop zone for the top of the Saluda. For the other case studies, the assessment of the karst features was based solely on available published geologic and karst potential maps. These case studies included the Sterling Ventures Mine site in Kentucky, the Lee Bottom Landfill site in Indiana, and the Valley View MSW Landfill site in Kentucky.

These methods utilize the best available published data in the absence of field studies at the various sites, which were not necessary for this screening-level analysis.

6. POTENTIAL CULTURAL OR HISTORIC RESOURCES

The assessment of impacts to potential cultural or historical resources that would result from each case study alternative were determined through existing data sources including aerial photographs, historical maps, and records held by State historic preservation offices (SHPO). Consultation with various agencies such as the Kentucky Office of State Archaeology (OSA), Kentucky Heritage Counsel (KHC), and Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (DHPA) was conducted to review archaeological reports resulting from field evaluations within the vicinity of a case study location. For the case study located in Indiana, the Indiana State Historic Architectural and Archaeological Research Database (SHAARD) was also reviewed.

The types of landforms present at a particular site location were also considered during the evaluation. Steep slopes, settings with disturbed surfaces, and wetlands have a low potential for archaeological sites. Moderately sloping landforms with intact soils have a moderate potential for archaeological sites. Gently sloping to level areas have a higher potential for buried archaeological sites. Due to the proximity to water resources, intact floodplain and terrace settings along the Ohio River have the highest potential for large prehistoric sites that have the potential to provide significant information that would contribute to our understanding of regional prehistory. Historic era domestic sites built prior to the mid-twentieth century and not impacted by later development have the highest potential to provide significant information for understanding regional history.

The various historical records and data for a given geographic vicinity and setting of a specific case study were summarized and reported. While the number of types of buried historic sites or artifacts cannot be predicted with a high degree of accuracy, the landforms and previously discovered historic and archeological sites can be utilized along with professional judgment to categorize a case study alternative. The alternatives are categorized as having a low, moderate or high potential for containing buried sites

and therefore potentially higher historic value. A case study alternative having a higher probability for containing these historic buried resources is considered, in general, to have a higher degree of potential impact to historic resources as a result of possible construction activities. While most historic sites can be mitigated through intensive field archaeological data recovery studies, the duration and cost of these studies can be significant.

7. CEMETERIES

The assessment of impacts to cemeteries was determined through research of historic or modern cemeteries known to be in the vicinity of a specific case study site. The locations of cemeteries were based upon historical map research, cultural resource data held by SHPOs, and information from websites such as findagrave.com. Cemeteries typically are not eligible for the National Register of Historic Places but each state has specific regulations regarding any impacts to cemeteries and human remains, therefore avoidance of cemeteries is recommended when possible in order to avoid opposition from family members of those buried in a cemetery and the extensive cemetery relocation process. The cemeteries that were identified through records research for the case studies included those shown on US Geological Survey topographic quadrangle maps. Construction and development of a landfill facility would likely be able to avoid known cemeteries based on the individual conceptual location of the landfills. This study also assumes cemeteries would be avoided in portions of the proposed impact area to be utilized for borrow material.. If a discovered cemetery (not yet identified) and immediate environs would be impacted, coordination with the SHPO and the U.S. Army Corps of Engineers (as the Lead Agency) is required. Cemetery relocations would be required to follow applicable State regulations.

8. AIR QUALITY

The potential air quality impact for each of the four case studies (Ravine B, Sterling Ventures, Lee Bottom, and Valley View) were estimated based on available information and several assumptions. Air pollutants of concern for these options were oxides of nitrogen (NOx), volatile organic compounds (VOCs), carbon monoxide (CO), and particulate matter less than 10 microns (PM-10).

Construction and disposal operation activities that produce substances classified as air pollutants, and which could significantly impact air quality, include but are not limited to:

- transportation of CCR material (barging, truck hauling on public highways, paved project roadways, and unpaved roadways, etc.);
- material handling of the CCRs (stockpiling, bulldozing, stacking, loading, etc.); and
- wind erosion of stationary CCR stockpiles.

Each of these activities was considered and evaluated on a case-by-case basis for each case study. For example, the Ravine B and Valley View alternatives would not generate emissions from river barging while both the Lee Bottom and Sterling Ventures alternatives would generate these emissions.

Emission factors for each type of activity were derived from various chapters of the EPA's AP-42 or EPA MOBILE 6.2.03 reference and guidance manuals. For some activities not specifically addressed within the EPA's AP-42 manual, an analogous chapter or reference that includes similar activities was used to estimate emissions.

For emission factors based on hours of equipment operation (barges, trucks, heavy equipment, etc.), the hourly rate of each piece of equipment was estimated based on the type of operations. When emission factors are based on vehicle miles traveled (VMT), the VMTs were estimated based upon designated routes and estimated travel distances. VMTs at the proposed landfills were estimated based on a conservative CCR placement scenario. It was assumed that trucks would travel to the approximate center of the landfill footprint with each haul trip. In reality, some haul trips within a landfill will involve shorter distances traveled (e.g. lower VMTs) than others.

Available meteorological data for each month from Louisville, Kentucky was used for the wind erosion calculations. The total estimated emissions of each air pollutant were calculated for each case study, by pollutant-generating activity, and presented for comparison purposes.

9. PUBLIC SAFETY

Potential impacts to public safety were considered, and have been summarized in this report, for case studies that would require operational activities within public areas or right-of-ways (e.g., public roads, Ohio River). Such activities would typically include two primary modes of transportation, i.e., truck traffic on public roadways, and barge transportation and loading/unloading operations on the Ohio River. The public could potentially be affected by these activities as there would be some level of risk of traffic accidents, and spills or releases of CCRs during transport on roads or the Ohio River. The higher the quantity of CCR materials to be disposed at facilities, and the distance of these case studies from the TC Station, the higher the risk to public safety throughout the duration of transporting CCR materials. Therefore, for each case study, the number and frequency of loads (e.g., by truck or barge), the roundtrip transport mileage, and the duration of hauling (based on facility capacity) were all considered to evaluate and compare the impacts to public safety. Public safety issues can raise questions regarding whether an alternative is practicable depending on the magnitude of the safety issues.

10. QUALITY OF LIFE INCLUDING AESTHETICS AND NOISE

The assessment of impacts for aesthetics and noise that would result from each case study alternative was determined based on proximity of local residents to the sites. The aesthetic impacts from a case study that requires constructing a landfill includes a changed landscape (viewshed) for residents residing in close proximity to the site and for vehicle occupants located or traveling on nearby public roads.

Noise levels during the construction of a case study alternative would be typical of most industrial settings, due to heavy equipment use for the construction of the CCR disposal facility as well as excavation and placement of CCR materials into the disposal facility. Blasting may necessary on occasion during the initial phase of a landfill's construction. Construction and operation activities would, in general,

be conducted during only daylight hours unless there is a critical need for short-term construction and/or operational activities during nighttime hours.

The number of residences located on a public road near a case study alternative was reviewed to consider both the noise and aesthetics impacts. The degree of aesthetic and noise impacts will be directly proportional to the transportation traffic resulting from a case study alternative. The higher the number of individual trucks or barges required to transport the CCR materials on a daily basis (for truck hauling, specifically), the greater the adverse impact on humans that would be located proximal to these activities.

APPENDIX IV.A-1

Fact Sheets for Other Alternatives

APPENDIX IV.A-1 FACT SHEETS FOR OTHER ALTERNATIVES

1. INTRODUCTION

The Fact Sheets are identified with letters A through Y, as summarized in the main report, Table IV.A-3.

Project descriptions and maps identify the project location and primary features. The acronym ES/SWM is used to indicate the presence of an erosion and sedimentation/stormwater management system, e.g. large ponds. Beyond what is shown on maps, additional acreage for each alternative would be impacted for borrow sources, transportation corridors, and other ancillary facilities. The total impacted area is not shown on the maps.

The fact sheets highlight the key considerations relevant to determining whether a given alternative could represent the Least Environmentally Damaging Practicable Alternative (LEDPA); the fact sheets are not intended to list all potentially relevant factors. Logistical considerations always include site capacity, which is the volume of CCR capable of being stored based on the conceptual design shown on the map. As discussed in Appendix III.C-1, alternatives that do not have sufficient capacity to meet minimum threshold requirements (23.4 mcy) are considered impracticable on that basis; for alternatives that have capacity exceeding that threshold but significantly less than the optimal capacity (33.4 mcy), capacity remains an issue although not a sole basis for a determination of impracticability. Floodplains are shown on the maps and are considered to make an alternative not practicable if a substantial part of the landfill footprint(s) is located within a 100-year floodplain. Sites are not ruled out if only ponds are in that floodplain and LG&E would own all downstream areas. The analysis also recognizes that barge facilities must be located in the floodplain.

Cost considerations are provided for alternatives that are not judged impracticable solely based on site capacity or location within the 100-year floodplain. Cost data reflect the added, incremental cost of the alternative compared to the cost of the Ravine B alternative. The costs reflect capital only and would be greater if operations and maintenance were calculated. Incremental costs for multiple landfills reflect information provided in Appendix IV.B-1 and are order of magnitude. Double handling of borrow material was not quantified but is an additional expense that results when borrow material cannot be directly moved from source to landfill, but must be temporarily stored (as occurs when the landfill is sited on ridgetops or other borrow areas that have high potential to possess clay material that can be used for liner and cover systems). Land costs are based on the estimated project acreage, assume willing sellers, and are the minimum expected. The property acquisition acreage listed was not quantified in detail per site, but instead is an approximation based on other alternatives analyzed (i.e. Lee Bottom would require approximately 1,650 acres, while the most land acquisition assumed for any Fact Sheet Alternative is 1,000 acres). Transportation costs include construction of barge facilities and/or a longer pipe conveyor, longer haul road, and transfer stations (if needed) than for Ravine B. In general, the lowest cost alternatives to Ravine B would cost an additional $1 per cubic yard, and that number may be larger if a more detailed analysis were performed.

Environmental considerations primarily identify when an alternative may have stream, wetland and bat habitat impacts that are potentially comparable to Ravine B (or more, where the impacted stream is perennial); or where there will be significant and potentially unacceptable impacts on existing residences, businesses, churches, etc. through displacement, construction (e.g. blasting), operational noise, viewshed aesthetics, and elimination of farmland. Additional impacts related to conditions such as cemeteries, cultural resources, karst features, and infrastructure relocation would occur in many cases but are not quantified in this effort. Costs to address these impacts would add to the incremental costs of all alternatives that are not ruled out on the basis of capacity or floodplain impacts, and in most cases the cost effect would be substantial even if the impacts were considered potentially acceptable.

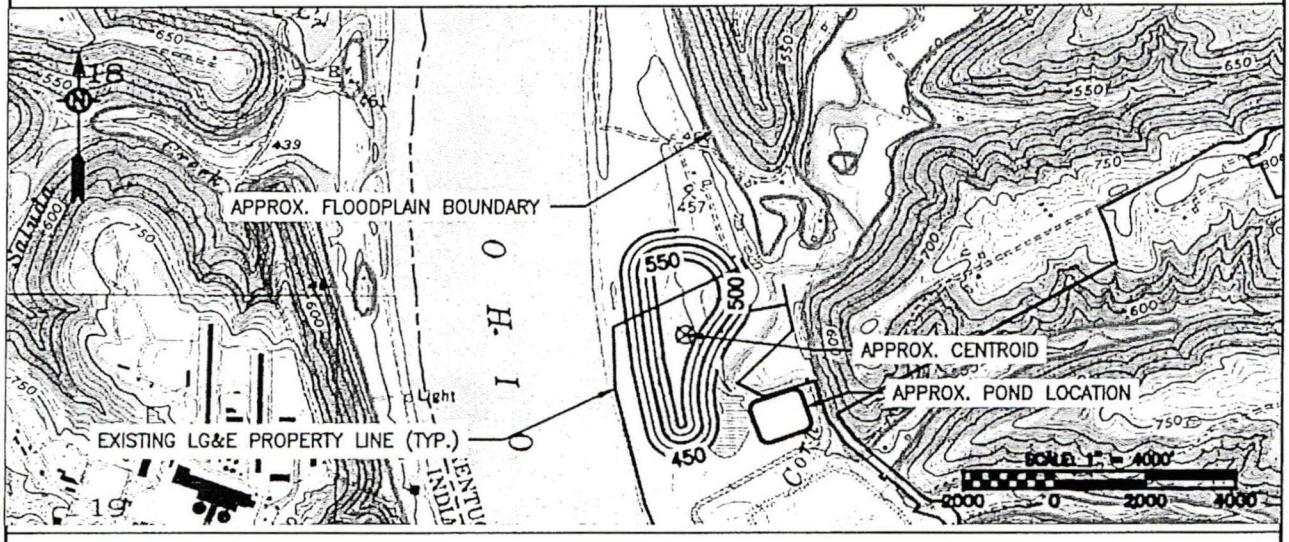
FACT SHEET A

PROJECT DESCRIPTION

SITE ID: A **FORMER ID:** 3A	**NAME:** DICKEY FARM	**LATITUDE:** 38° 36' 22.4489" **LONGITUDE:** -85° 25' 41.2252"

CONCEPT: Single landfill along the bank of the Ohio River near Corn Creek, north of TC Station.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to insufficient site capacity and construction within 100-year Floodplain.

SITE MAP: ALTERNATIVE A DICKEY FARM



LOGISTICAL CONSIDERATIONS

ITEM:	IMPACT:
SITE CAPACITY:	6.1 MCY[1]
100-YEAR FLOODPLAIN:	LANDFILL IS WITHIN 100-YEAR FLOODPLAIN.

COST CONSIDERATIONS

COST NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON INSUFFICIENT CAPACITY AND LOCATION IN 100-YEAR FLOODPLAIN. SEE LOGISTICAL CONSIDERATIONS.

ENVIRONMENTAL RESOURCES CONSIDERATIONS

IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON INSUFFICIENT SITE CAPACITY AND LOCATION IN 100-YEAR FLOODPLAIN. SEE LOGISTICAL CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL CONSIDERATIONS: INSUFFICIENT SITE CAPACITY AND 100-YEAR FLOODPLAIN IMPACTS.

SITE CONSIDERED IN COMBINATION WITH OTHER SITES IN ALTERNATIVES M, O, AND W.

NOTES:

1. SITE CAPACITY IS CONSTRAINED FOR THIS SITE ALTERNATIVE DUE TO ATTEMPT TO KEEP THE LANDFILL INSIDE OF EXISTING LG&E PROPERTY AND AVOID IMPACTS TO POTENTIAL HISTORIC HOUSES/SITES TO THE NORTH OF THE AREA KNOWN AS "DICKEY FARM". EXPANSION OF THE LANDFILL TO THE NORTH WOULD CREATE ADDITIONAL LOGISTICAL, COST, AND ENVIRONMENTAL IMPACTS, AND WOULD STILL FALL ENTIRELY WITHIN THE 100-YEAR FLOODPLAIN.

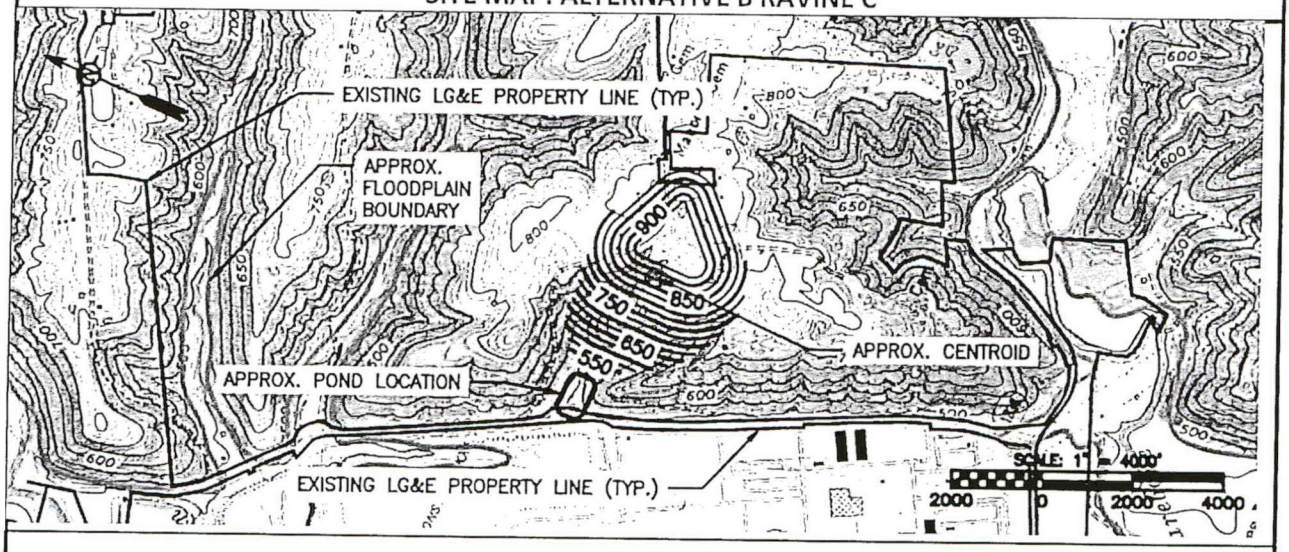
FACT SHEET B

PROJECT DESCRIPTION

SITE ID: B FORMER ID: 3B	NAME: RAVINE C	LATITUDE: 38° 35' 35.9952" LONGITUDE: -85° 24' 24.0720"

CONCEPT: Single landfill on existing LG&E property in Ravine C, east of TC Station.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to insufficient site capacity.

SITE MAP: ALTERNATIVE B RAVINE C



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	8.7 MCY[1]
100-YEAR FLOODPLAIN:	LANDFILL IS OUTSIDE 100-YEAR FLOODPLAIN.

COST CONSIDERATIONS
COST NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON INSUFFICIENT CAPACITY. SEE LOGISTICAL CONSIDERATIONS.

ENVIRONMENTAL RESOURCES CONSIDERATIONS
IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON INSUFFICIENT CAPACITY. SEE LOGISTICAL CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL CONSIDERATIONS: INSUFFICIENT SITE CAPACITY.

SITE CONSIDERED IN COMBINATION WITH OTHER SITES IN ALTERNATIVES M, O, R, S, T, AND X.

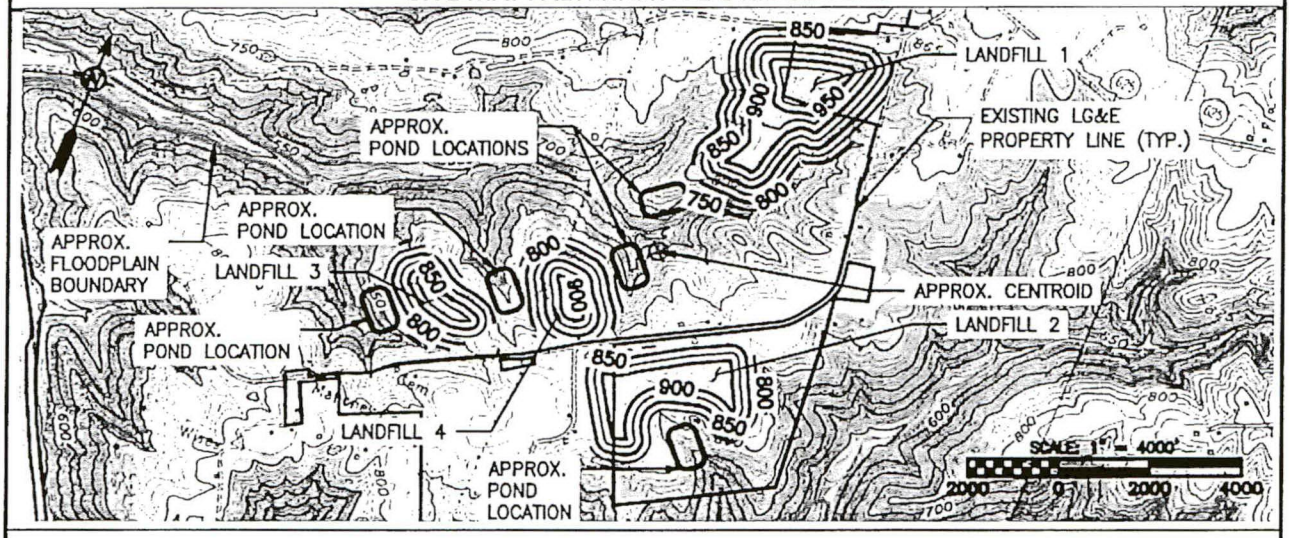
NOTES:

1. SITE CAPACITY IS CONSTRAINED FOR THIS SITE ALTERNATIVE DUE TO ATTEMPT TO KEEP THE LANDFILL INSIDE OF THE DRAINAGE AREA KNOWN AS "RAVINE C". EXPANSION OF THE LANDFILL IS TAKEN INTO CONSIDERATION IN SITES R AND S.

FACT SHEET C

PROJECT DESCRIPTION		
SITE ID: C **FORMER ID:** 3C	**NAME:** RIDGE TOPS	**LATITUDE:** 38° 36' 08.0422" **LONGITUDE:** -85° 23' 29.7293"
CONCEPT: Four landfills on existing LG&E property on ridge tops south and east of Ravine B, east of TC Station.		**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck		**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to Insufficient site capacity.

SITE MAP: ALTERNATIVE C RIDGE TOPS



LOGISTICAL CONSIDERATIONS	
ITEM:	**IMPACT:**
SITE CAPACITY:	12.8 MCY[1]
100-YEAR FLOODPLAIN:	LANDFILLS ARE OUTSIDE 100-YEAR FLOODPLAIN.

COST CONSIDERATIONS[2]	
ORDER OF MAGNITUDE COST OF MULTIPLE LANDFILLS:	$2-5/CY
DOUBLE HANDLING OF CLAY BORROW MATERIAL.	

ENVIRONMENTAL RESOURCES CONSIDERATIONS
IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON INSUFFICIENT CAPACITY AND REQUIREMENT OF FOUR INDIVIDUAL LANDFILLS. SEE LOGISTICAL AND COST CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL AND COST CONSIDERATIONS: INSUFFICIENT SITE CAPACITY AND WOULD REQUIRE FOUR INDIVIDUAL LANDFILLS, RESULTING IN SIGNIFICANT ADDITIONAL COST. SEE APPENDIX IV.B-1 FOR ANALYSIS OF ADDITIONAL COST ASSOCIATED WITH MULTIPLE LANDFILLS.

SITE CONSIDERED IN COMBINATION WITH OTHER SITES IN ALTERNATIVES M AND Y (LANDFILL 1 ONLY).

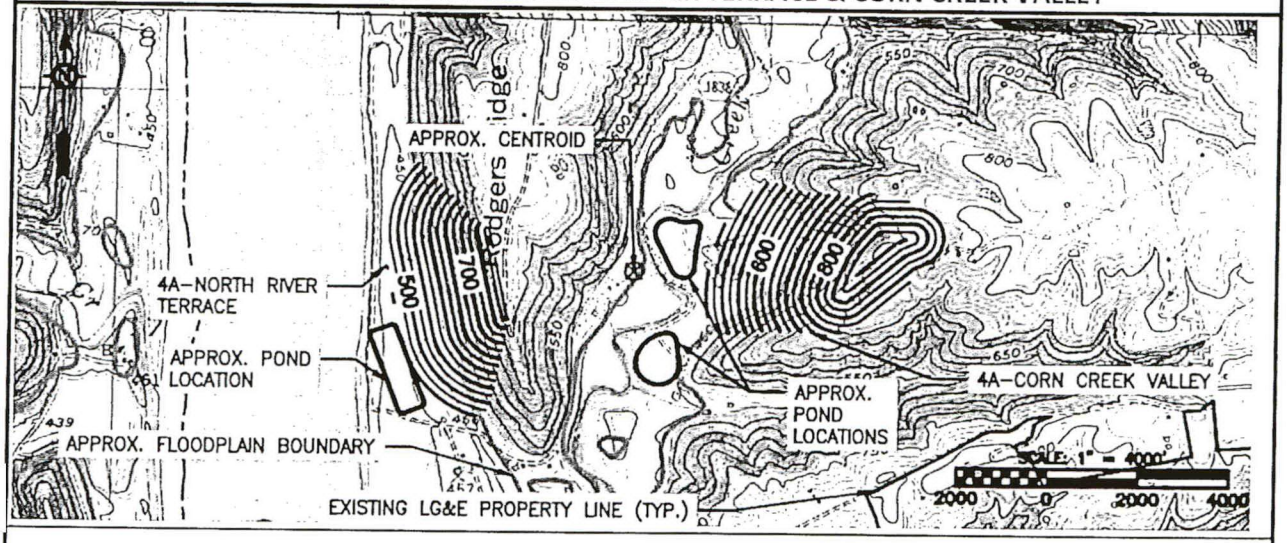
NOTES:

1. SITE CAPACITY IS CONSTRAINED FOR THIS SITE ALTERNATIVE DUE TO ATTEMPT TO KEEP THE LANDFILLS ON TOP OF RIDGETOPS TO LIMIT THE AMOUNT OF IMPACTS TO RAVINES. EXPANSION OF THE LANDFILLS INTO RAVINES WOULD LEAD TO ENVIRONMENTAL IMPACTS SIMILAR TO RAVINE ALTERNATIVES.
2. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

FACT SHEET D

PROJECT DESCRIPTION		
SITE ID: D FORMER ID: 4A	NAME: NORTH RIVER TERRACE & CORN CREEK VALLEY	LATITUDE: 38° 37' 02.0518" LONGITUDE: -85° 25' 17.4956"
CONCEPT: Two landfills north of the TC Station; one along Ohio River, other along Corn Creek in ravine.		ANCILLARY FACILITIES: ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor (or Barge), Truck		ALTERNATIVES ANALYSIS (AA) OUTCOME: Eliminated in Cut I due to construction within 100-year Floodplain and insufficient site capacity.

SITE MAP: ALTERNATIVE D NORTH RIVER TERRACE & CORN CREEK VALLEY



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	19.0 MCY[1]
100-YEAR FLOODPLAIN:	BOTH LANDFILLS ARE PARTIALLY WITHIN 100-YEAR FLOODPLAIN.

COST CONSIDERATIONS
COST NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON INSUFFICIENT CAPACITY AND LOCATION IN 100-YEAR FLOODPLAIN. SEE LOGISTICAL CONSIDERATIONS.

ENVIRONMENTAL RESOURCES CONSIDERATIONS
IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON INSUFFICIENT CAPACITY AND LOCATION IN 100-YEAR FLOODPLAIN. SEE LOGISTICAL CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL CONSIDERATIONS: INSUFFICIENT SITE CAPACITY AND 100-YEAR FLOODPLAIN IMPACTS.

SITE CONSIDERED IN COMBINATION WITH OTHER SITES IN ALTERNATIVES O, Q (CORN CREEK VALLEY ONLY), T, AND V (CORN CREEK VALLEY ONLY).

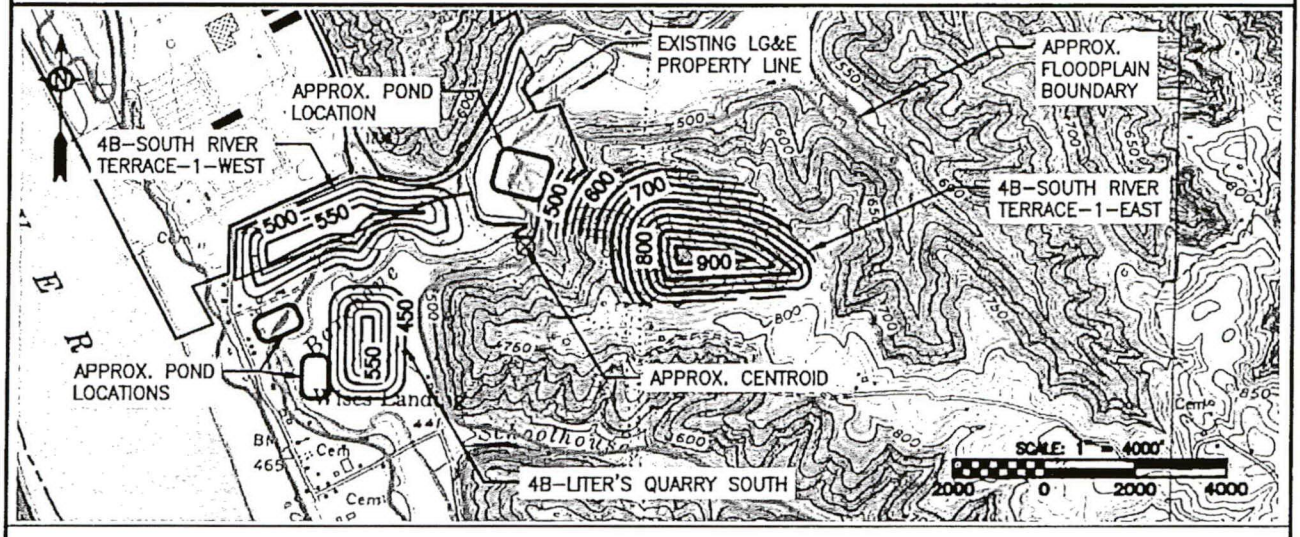
NOTES:

1. SITE CAPACITY IS CONSTRAINED FOR THIS SITE ALTERNATIVE DUE TO ATTEMPT TO KEEP THE LANDFILL 4A-NORTH RIVER TERRACE OUT OF THE 100-YEAR FLOODPLAIN AS MUCH AS POSSIBLE, AND THE LANDFILL 4A-CORN CREEK VALLEY WITHIN A SINGLE DRAINAGE AREA. XPANSION OF THESE LANDFILLS WOULD CREATE ADDITIONAL LOGISTICAL, COST, AND ENVIRONMENTAL IMPACTS, AND THE MAJORITY VOULD STILL FALL WITHIN THE 100-YEAR FLOODPLAIN.

FACT SHEET E

PROJECT DESCRIPTION		
SITE ID: E	**NAME:** SOUTH RIVER TERRACE-1 & LITER'S QUARRY	**LATITUDE:** 38° 34' 42.5698"
FORMER ID: 4B		**LONGITUDE:** -85° 23' 59.8065"
CONCEPT: Three landfills along Barebone Creek, south of TC Station.		**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck		**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to insufficient site capacity and construction within mining/quarry areas. Also, is within 100-Year Floodplain.

SITE MAP: ALTERNATIVE E SOUTH RIVER TERRACE-1 & LITER'S QUARRY



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	22.5 MCY[1]
100-YEAR FLOODPLAIN:	TWO LANDFILLS ARE WITHIN 100-YEAR FLOODPLAIN.
CONSTRUCTION WITHIN MINE/QUARRY.	

COST CONSIDERATIONS[2]	
ORDER OF MAGNITUDE COST OF MULTIPLE LANDFILLS:	$2-5/CY

ENVIRONMENTAL RESOURCES CONSIDERATIONS
IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON INSUFFICIENT CAPACITY, CONSTRUCTION WITHIN MINING/QUARRY AREAS, LOCATION IN 100-YEAR FLOODPLAIN, AND ADDITIONAL COST ASSOCIATED WITH THE USE OF MULTIPLE LANDFILLS. SEE LOGISTICAL AND COST CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL AND COST CONSIDERATIONS: INSUFFICIENT SITE CAPACITY, CONSTRUCTION WITHIN MINING/QUARRY AREAS, 100-YEAR FLOODPLAIN IMPACTS, AND COST OF MULTIPLE LANDFILLS. SEE APPENDIX IV.B-1 FOR ANALYSIS OF ADDITIONAL COST ASSOCIATED WITH MULTIPLE LANDFILLS.

SITE CONSIDERED IN COMBINATION WITH OTHER SITES IN ALTERNATIVES N (SOUTH RIVER TERRACE-1-EAST ONLY), P, U (SOUTH RIVER TERRACE-1-EAST ONLY), AND V (SOUTH RIVER TERRACE-1-EAST ONLY).

NOTES:

1. SITE CAPACITY IS CONSTRAINED FOR THIS SITE ALTERNATIVE DUE TO ATTEMPT TO KEEP THE LANDFILLS AWAY FROM THE PERENNIAL STREAM BAREBONE CREEK. EXPANSION OF THE LANDFILLS WOULD CREATE ADDITIONAL LOGISTICAL, COST, AND ENVIRONMENTAL IMPACTS, AND WOULD STILL INCLUDE PARTS OF THE TWO LANDFILLS WITHIN THE 100-YEAR FLOODPLAIN.
2. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

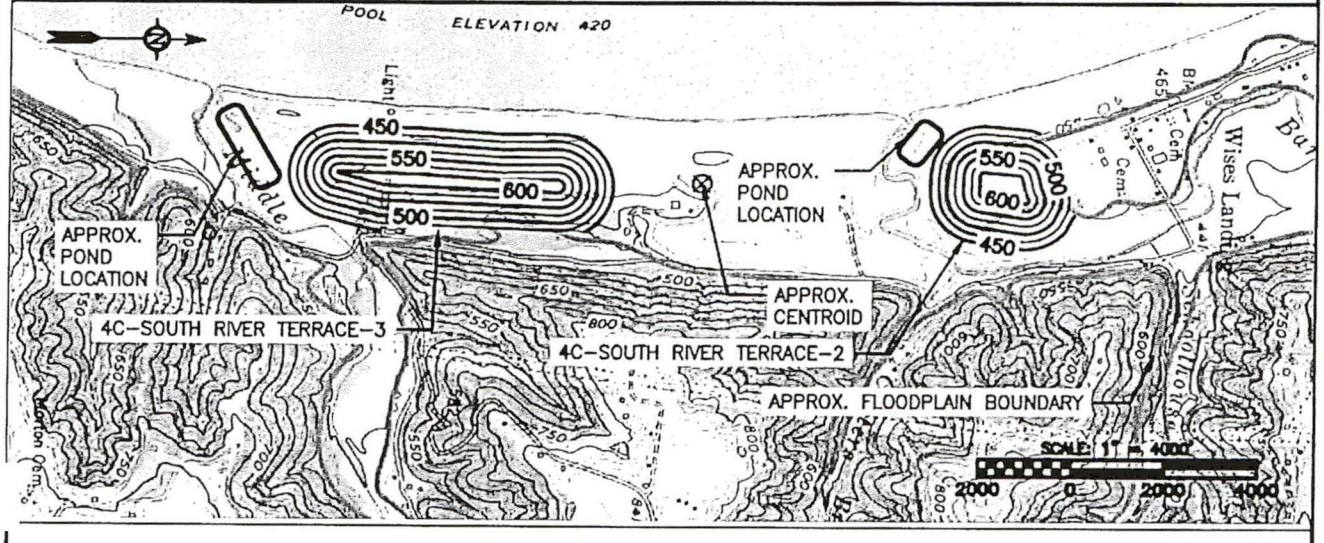
FACT SHEET F

PROJECT DESCRIPTION

SITE ID: F FORMER ID: 4C	NAME: SOUTH RIVER TERRACE-2 & SOUTH RIVER TERRACE-3	LATITUDE: 38° 33' 29.0150" LONGITUDE: -85° 24' 18.5848"

CONCEPT: Multiple landfills in terrace near Middle Creek, south of TC Station.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor (or Barge), Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to construction within 100-year Floodplain and insufficient site capacity.

SITE MAP: ALTERNATIVE F SOUTH RIVER TERRACE-2 & SOUTH RIVER TERRACE-3



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	14.4 MCY[1]
100-YEAR FLOODPLAIN:	LANDFILLS ARE WITHIN 100-YEAR FLOODPLAIN.

COST CONSIDERATIONS
COST NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON INSUFFICIENT CAPACITY AND LOCATION IN 100-YEAR FLOODPLAIN. SEE LOGISTICAL CONSIDERATIONS.

ENVIRONMENTAL RESOURCES CONSIDERATIONS
IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON INSUFFICIENT CAPACITY AND LOCATION IN 100-YEAR FLOODPLAIN. SEE LOGISTICAL CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL CONSIDERATIONS: INSUFFICIENT SITE CAPACITY AND 100-YEAR FLOODPLAIN IMPACTS.

SITE CONSIDERED IN COMBINATION WITH OTHER SITES IN ALTERNATIVES P AND U (SOUTH RIVER TERRACE-3 ONLY).

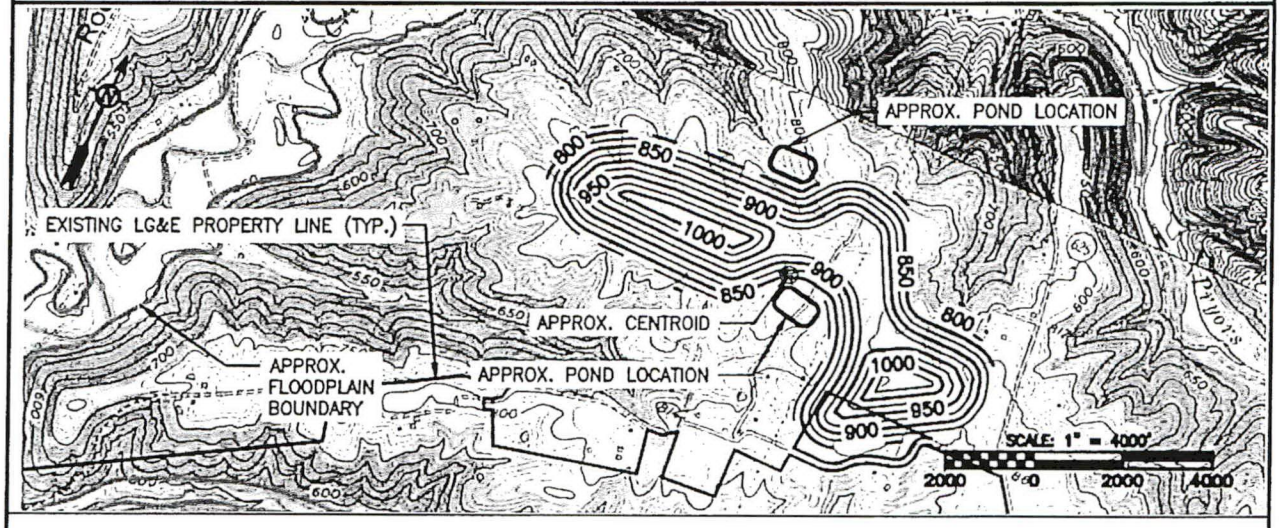
NOTES:

1. SITE CAPACITY IS CONSTRAINED FOR THIS SITE ALTERNATIVE DUE TO ATTEMPT TO KEEP THE LANDFILLS OUT OF THE FLOODPLAIN AS MUCH AS POSSIBLE. EXPANSION OF THESE LANDFILLS WOULD CREATE ADDITIONAL LOGISTICAL, COST, AND ENVIRONMENTAL IMPACTS, AND THE MAJORITY WOULD STILL FALL WITHIN THE 100-YEAR FLOODPLAIN.

FACT SHEET G

PROJECT DESCRIPTION		
SITE ID: G **FORMER ID:** 4D	**NAME:** CONNOR RIDGE ROAD RIDGE TOPS	**LATITUDE:** 38° 37' 10.3872" **LONGITUDE:** -85° 23' 51.8119"
CONCEPT: Single landfill on ridge top northeast of Ravine A, northeast of TC Station.		**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck		**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut II due to encountering a large number of cost, logistical, safety, and socioeconomic issues.

SITE MAP: ALTERNATIVE G CONNOR RIDGE ROAD RIDGE TOPS



LOGISTICAL CONSIDERATIONS	
ITEM:	**IMPACT:**
SITE CAPACITY:	23.9 MCY[2]
100-YEAR FLOODPLAIN:	LANDFILL IS OUTSIDE 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~800 ACRES, INCLUDES RESIDENCES AND FARMLAND.

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~800 ACRES ~$10 MILLION
CCR TRANSPORT DISTANCE:	~10,000 FT LONGER THAN RAVINE B ~$40 MILLION
DOUBLE HANDLING OF CLAY BORROW MATERIAL.	

ENVIRONMENTAL RESOURCES CONSIDERATIONS
QUALITY OF LIFE INCLUDING AESTHETICS AND NOISE IMPACTS.
PRIME FARMLAND WOULD BE ELIMINATED.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT COST CONSIDERATIONS FOR PROPERTY ACQUISITION (~800 ACRES) AND CCR TRANSPORT DISTANCE (~10,000 FT LONGER), AMOUNTING TO ~$2/CY OR MORE IN ADDITIONAL COSTS EVEN WITHOUT TAKING INTO CONSIDERATION ADDED O&M COSTS AND COSTS FOR DOUBLE HANDLING OF CLAY. ADDITIONALLY, ENVIRONMENTAL RESOURCES CONSIDERATIONS INCLUDE THE QUALITY OF LIFE OF SURROUNDING RESIDENTS AND TRAVELERS, AND LOSS OF PRIME FARMLAND.

SITE CONSIDERED IN COMBINATION WITH OTHER SITES IN ALTERNATIVES Q, X, AND Y.

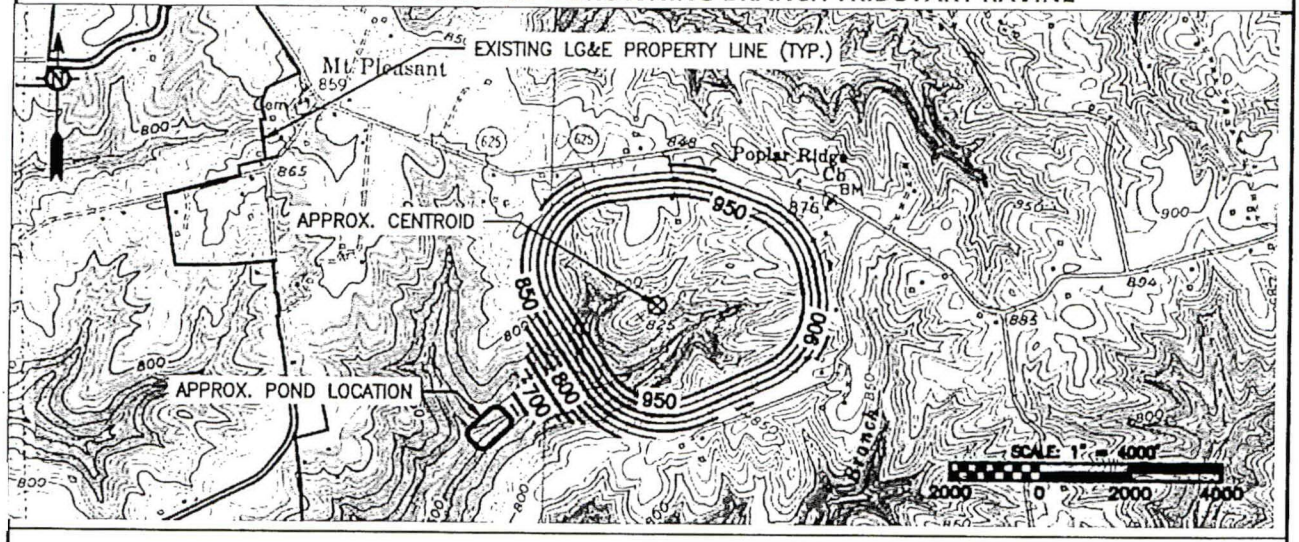
NOTES:

1. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.
2. SITE CAPACITY IS CONSTRAINED FOR THIS SITE ALTERNATIVE DUE TO THE ATTEMPT TO KEEP THE LANDFILL ON TOP OF RIDGETOPS TO LIMIT THE AMOUNT OF IMPACTS TO RAVINES, INCLUDING RAVINE A (AN OSRW). EXPANSION OF THE LANDFILL INTO RAVINES WOULD CREATE ADDITIONAL LOGISTICAL, COST, AND ENVIRONMENTAL IMPACTS, SUCH AS RUNOFF INTO A NUMBER OF DIFFERENT WATERSHEDS, ADDITIONAL STREAM IMPACTS, AND MORE PROPERTY ACQUISITION.

FACT SHEET H

PROJECT DESCRIPTION		
SITE ID: H **FORMER ID:** 4E	**NAME:** BROWNING BRANCH TRIBUTARY RAVINE	**LATITUDE:** 38° 36' 25.8066" **LONGITUDE:** -85° 22' 14.4739"
CONCEPT: Single landfill, located in a tributary to Browning Branch, east of TC Station.		**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck		**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut II due to encountering a large number of cost, logistical, safety, and socioeconomic issues.

SITE MAP: ALTERNATIVE H BROWNING BRANCH TRIBUTARY RAVINE



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	36.2 MCY
100-YEAR FLOODPLAIN:	LANDFILL IS OUTSIDE 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~1,000 ACRES, INCLUDES RESIDENCES AND FARMLAND.

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~1,000 ACRES ~$12 MILLION
CCR TRANSPORT DISTANCE:	~6,000 FT LONGER THAN RAVINE B ~$30 MILLION

ENVIRONMENTAL RESOURCES CONSIDERATIONS
QUALITY OF LIFE INCLUDING AESTHETICS AND NOISE IMPACTS.
PRIME FARMLAND WOULD BE ELIMINATED.
STREAM, WETLAND, AND ENDANGERED SPECIES HABITAT IMPACTS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL AND COST CONSIDERATIONS: PROPERTY ACQUISITION (~1,000 ACRES) AND CCR TRANSPORT DISTANCE (~6,000 FT LONGER THAN RAVINE B ALTERNATIVES) RESULTING IN SIGNIFICANT ADDITIONAL COST. THIS SITE ALTERNATIVE WOULD HAVE SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS, INCLUDING IMPACTS TO STREAMS, WETLANDS AND ENDANGERED SPECIES HABITAT, DISPLACEMENT OF RESIDENCES AND A CHURCH AND OTHER IMPACTS TO THE QUALITY OF LIFE OF SURROUNDING RESIDENTS, AND LOSS OF PRIME FARMLAND.

NOTES:

1. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE 3 SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS TEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

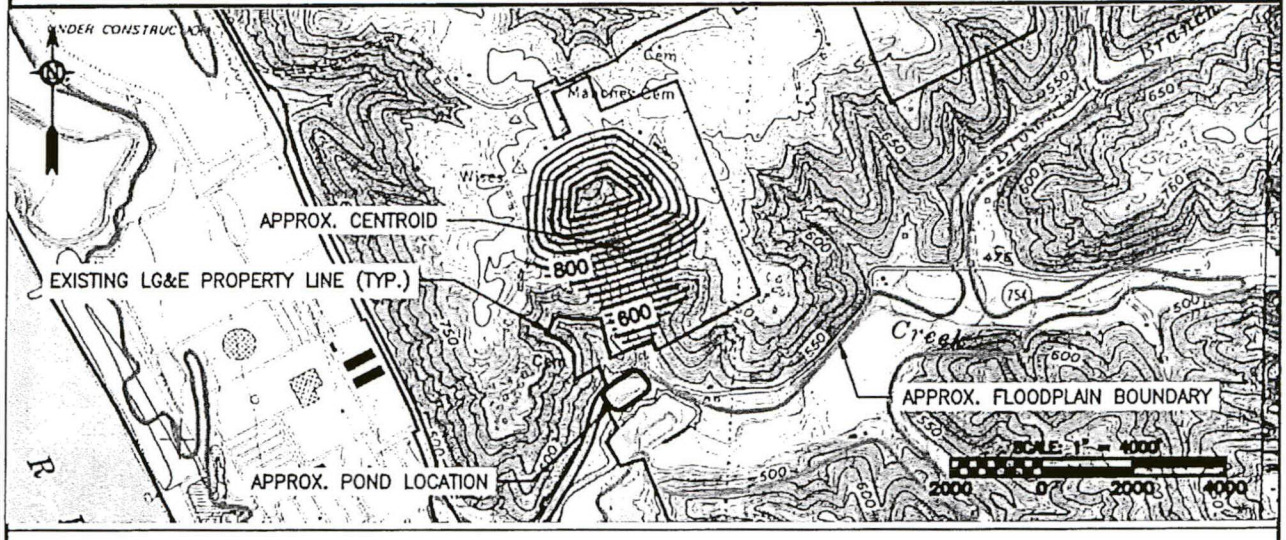
FACT SHEET I

PROJECT DESCRIPTION

SITE ID: I **FORMER ID:** 4F	**NAME:** BAREBONE TRIBUTARY RAVINE	**LATITUDE:** 38° 35' 22.6782" **LONGITUDE:** -85° 24' 00.0692"

CONCEPT: Single landfill east of TC Station in ravine north of Barebone Creek.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to insufficient site capacity.

SITE MAP: ALTERNATIVE I BAREBONE TRIBUTARY RAVINE



LOGISTICAL CONSIDERATIONS

ITEM:	IMPACT:
SITE CAPACITY:	14.8 MCY[1]
100-YEAR FLOODPLAIN:	LANDFILL IS OUTSIDE 100-YEAR FLOODPLAIN.

COST CONSIDERATIONS

COST NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON INSUFFICIENT CAPACITY. SEE LOGISTICAL CONSIDERATIONS.

ENVIRONMENTAL RESOURCES CONSIDERATIONS

STREAM, WETLAND, AND ENDANGERED SPECIES HABITAT IMPACTS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL CONSIDERATIONS: INSUFFICIENT SITE CAPACITY.

SITE CONSIDERED IN COMBINATION WITH OTHER SITES IN ALTERNATIVES N, R, AND S.

NOTES:

1. SITE CAPACITY IS CONSTRAINED FOR THIS SITE ALTERNATIVE DUE TO ATTEMPT TO KEEP THE LANDFILL INSIDE OF THE DRAINAGE AREA KNOWN AS "BAREBONE TRIBUTARY RAVINE". EXPANSION OF THE LANDFILL IS TAKEN INTO CONSIDERATION IN SITES R AND S.

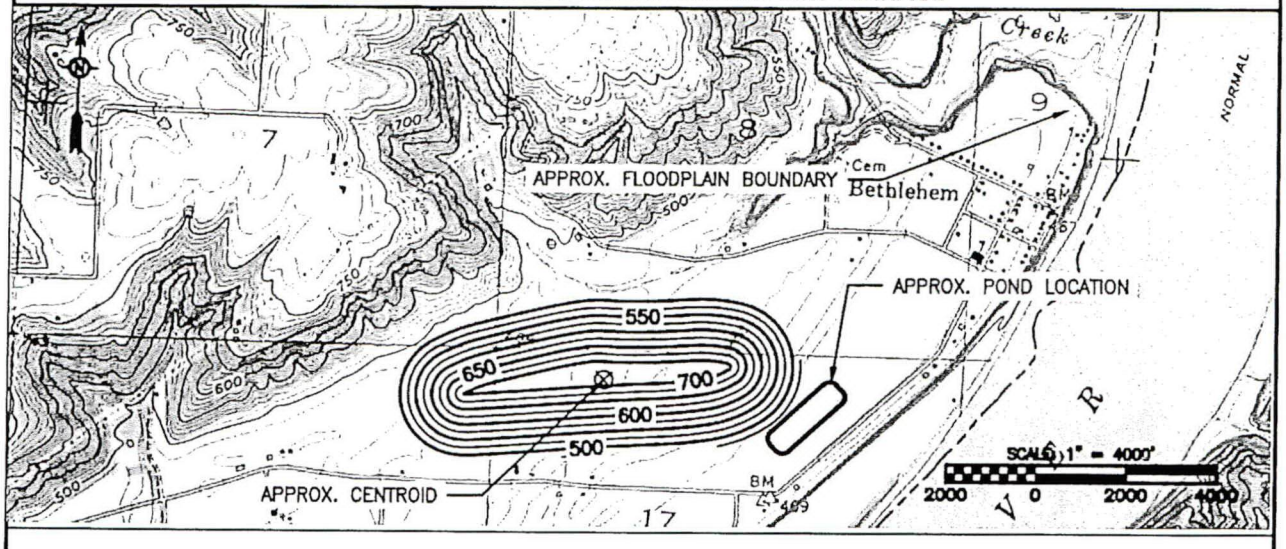
FACT SHEET J

PROJECT DESCRIPTION

SITE ID: J **FORMER ID:** 5A	**NAME:** BETHLEHEM TERRACE	**LATITUDE:** 38° 32' 02.6074" **LONGITUDE:** -85° 26' 09.7134"

CONCEPT: Single landfill in Bethlehem Terrace, near Bethlehem, Indiana, southwest of TC Station.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Barge, Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to construction within mining/quarry areas and the requirements of barge transport.

SITE MAP: ALTERNATIVE J BETHLEHEM TERRACE



LOGISTICAL CONSIDERATIONS	
ITEM:	**IMPACT:**
SITE CAPACITY:	33.7 MCY
100-YEAR FLOODPLAIN:	BARGE FACILITIES WITHIN 100-YEAR FLOODPLAIN. LANDFILL IS OUTSIDE 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~1,000 ACRES
PERMITTING WITHIN INDIANA	
CONSTRUCTION WITHIN MINE/QUARRY AREA.	

COST CONSIDERATIONS[1]
INCREMENTAL COSTS ARE SIMILAR TO OR GREATER THAN LEE BOTTOM CASE STUDY (I.E. ORDER OF MAGNITUDE OF $4/CY MORE EXPENSIVE THAN RAVINE B). SEE LEE BOTTOM CASE STUDY FOR ADDITIONAL INFORMATION.

ENVIRONMENTAL RESOURCES CONSIDERATIONS
ENVIRONMENTAL RESOURCES CONSIDERATIONS ARE SIMILAR TO LEE BOTTOM CASE STUDY (WITH EXCEPTION OF NO KNOWN FLYING FIELD). SEE LEE BOTTOM CASE STUDY FOR ADDITIONAL INFORMATION.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIMILAR LOGISTICAL, COST, AND ENVIRONMENTAL RESOURCE CONSIDERATIONS AS THE LEE BOTTOM CASE STUDY. ADDITIONALLY, THE SITE WOULD INVOLVE CONSTRUCTION WITHIN MINE/QUARRY AREAS.

NOTES:

1. THIS SITE ALTERNATIVE WOULD INCUR COST SIMILAR TO OR GREATER THAN THE LEE BOTTOM CASE STUDY ALTERNATIVE ANALYZED IN SECTION III OF THE REPORT. SEE LEE BOTTOM CASE STUDY FOR DETAILED COST INFORMATION.

FACT SHEET K

PROJECT DESCRIPTION		
SITE ID: K **FORMER ID:** 5C	**NAME:** SPRING CREEK TERRACE	**LATITUDE:** 38° 40' 37.7874" **LONGITUDE:** -85° 26' 24.2457"
CONCEPT: Single landfill in Spring Creek terrace, near Fisher Ridge Road, north of TC Station.		**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Barge, Truck		**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to construction within 100-year Floodplain and the requirement of barge transport.

SITE MAP: ALTERNATIVE K SPRING CREEK TERRACE



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	35.4 MCY
100-YEAR FLOODPLAIN:	LANDFILL IS WITHIN 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~1,000 ACRES

COST CONSIDERATIONS[1]
INCREMENTAL COSTS ARE SIMILAR TO OR GREATER THAN LEE BOTTOM CASE STUDY (I.E. ORDER OF MAGNITUDE OF $4/CY MORE EXPENSIVE THAN RAVINE B). SEE LEE BOTTOM CASE STUDY FOR ADDITIONAL INFORMATION.

ENVIRONMENTAL RESOURCES CONSIDERATIONS
ENVIRONMENTAL RESOURCES CONSIDERATIONS ARE SIMILAR TO LEE BOTTOM CASE STUDY (WITH EXCEPTION OF NO KNOWN FLYING FIELD). SEE LEE BOTTOM CASE STUDY FOR ADDITIONAL INFORMATION. ADDITIONALLY, THIS SITE IS LOCATED WITHIN THE 100-YEAR FLOODPLAIN.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIMILAR LOGISTICAL, COST, AND ENVIRONMENTAL RESOURCE CONSIDERATIONS AS THE LEE BOTTOM CASE STUDY. ADDITIONALLY, THIS SITE ALTERNATIVE IS SUBSTANTIALLY LOCATED WITHIN THE 100-YEAR FLOODPLAIN.

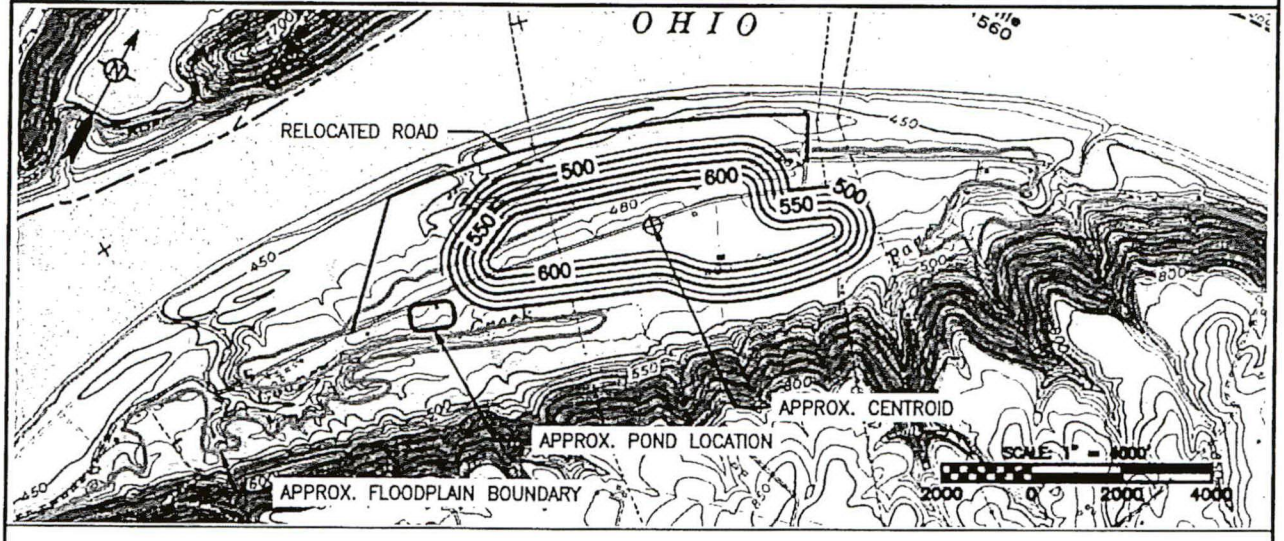
NOTES:

1. THIS SITE ALTERNATIVE WOULD INCUR COST SIMILAR TO OR GREATER THAN THE LEE BOTTOM CASE STUDY ALTERNATIVE ANALYZED IN SECTION III OF THE REPORT. SEE LEE BOTTOM CASE STUDY FOR DETAILED COST INFORMATION.

FACT SHEET L

PROJECT DESCRIPTION		
SITE ID: L **FORMER ID:** 5D	**NAME:** COOPER BOTTOM	**LATITUDE:** 38° 43' 22.0372" **LONGITUDE:** -85° 25' 36.3189"
CONCEPT: Single landfill in Cooper Bottom terrace, near Coopers Bottom Road, north of TC Station.		**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Barge, Truck		**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to construction within 100-year Floodplain and the requirement of barge transport.

SITE MAP: ALTERNATIVE L COOPER BOTTOM



LOGISTICAL CONSIDERATIONS	
ITEM:	**IMPACT:**
SITE CAPACITY:	25.4 MCY
100-YEAR FLOODPLAIN:	LANDFILL IS WITHIN 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~1,000 ACRES

COST CONSIDERATIONS[1]

INCREMENTAL COSTS ARE SIMILAR TO OR GREATER THAN LEE BOTTOM CASE STUDY (I.E. ORDER OF MAGNITUDE OF $4/CY MORE EXPENSIVE THAN RAVINE B). SEE LEE BOTTOM CASE STUDY FOR ADDITIONAL INFORMATION.

ENVIRONMENTAL RESOURCES CONSIDERATIONS

ENVIRONMENTAL RESOURCES CONSIDERATIONS ARE SIMILAR TO LEE BOTTOM CASE STUDY (WITH EXCEPTION OF NO KNOWN FLYING FIELD). SEE LEE BOTTOM CASE STUDY FOR ADDITIONAL INFORMATION. ADDITIONALLY, THIS SITE IS LOCATED WITHIN THE 100-YEAR FLOODPLAIN.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIMILAR LOGISTICAL, COST, AND ENVIRONMENTAL RESOURCE CONSIDERATIONS AS THE LEE BOTTOM CASE STUDY. ADDITIONALLY, THIS SITE ALTERNATIVE IS SUBSTANTIALLY LOCATED WITHIN THE 100-YEAR FLOODPLAIN.

NOTES:

1. THIS SITE ALTERNATIVE WOULD INCUR COST SIMILAR TO OR GREATER THAN THE LEE BOTTOM CASE STUDY ALTERNATIVE ANALYZED IN SECTION III OF THE REPORT. SEE LEE BOTTOM CASE STUDY FOR DETAILED COST INFORMATION.

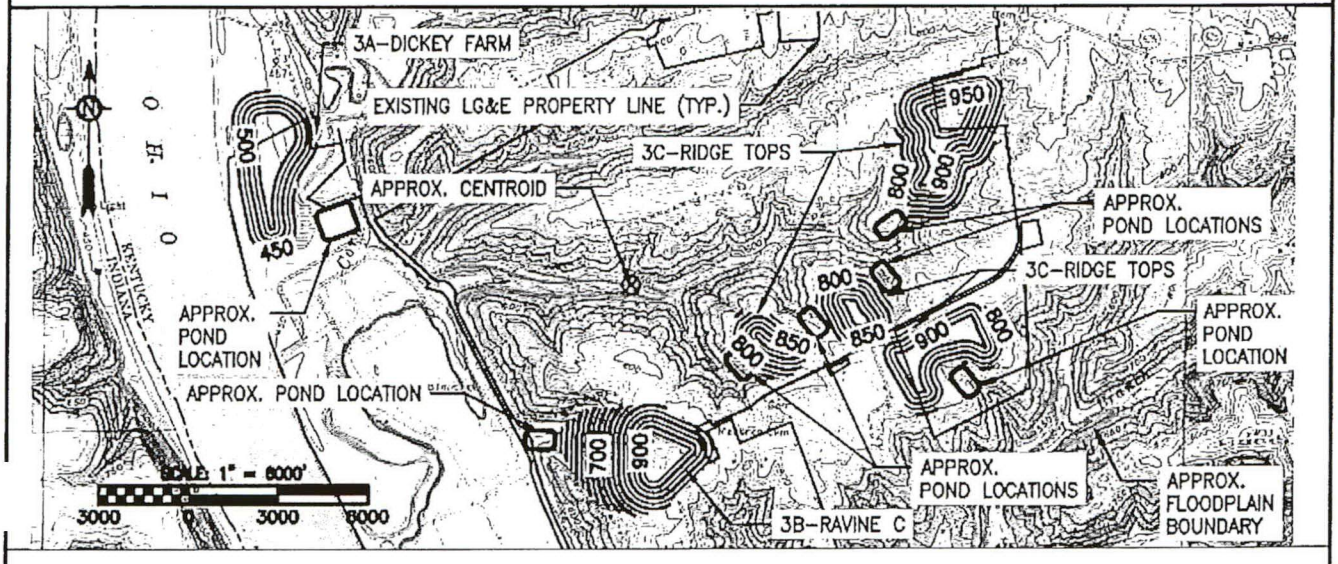
FACT SHEET M

PROJECT DESCRIPTION

SITE ID: M FORMER ID: Combination 1	NAME: 3A Dickey Farm, 3B Ravine C, 3C Ridge Tops	LATITUDE: 38° 36' 03.6121" LONGITUDE: -85° 24' 25.7932"

CONCEPT: Six landfills north and east of TC Station; one along Ohio River, the rest in Ravine B, C, and eastern ridge tops.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to the high cost of six individual landfills needed to meet site capacity requirements.

SITE MAP: ALTERNATIVE M COMBINATION 1



LOGISTICAL CONSIDERATIONS

ITEM:	IMPACT:
SITE CAPACITY:	27.6 MCY
100-YEAR FLOODPLAIN:	ONE LANDFILL IS LOCATED WITHIN 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~200 ACRES

COST CONSIDERATIONS[1]

ORDER OF MAGNITUDE COST OF MULTIPLE LANDFILLS:	~$2-5/CY

ENVIRONMENTAL RESOURCES CONSIDERATIONS

IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON LOCATION IN 100-YEAR FLOODPLAIN AND REQUIREMENT OF SIX INDIVIDUAL LANDFILLS. SEE LOGISTICAL AND COST CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL AND COST CONSIDERATIONS: 100-YEAR FLOODPLAIN IMPACTS AND COST DUE TO REQUIREMENT OF SIX INDIVIDUAL LANDFILLS. SEE APPENDIX IV.B-1 FOR ANALYSIS OF ADDITIONAL COSTS ASSOCIATED WITH MULTIPLE LANDFILLS.

NOTES:

1. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS TEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

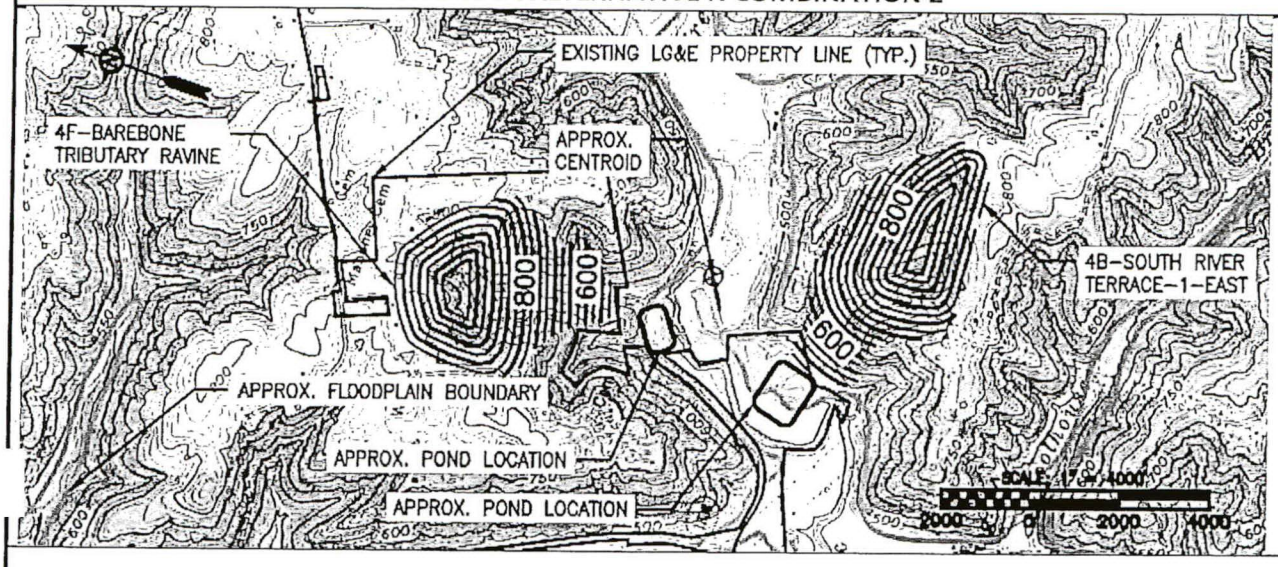
FACT SHEET N

PROJECT DESCRIPTION

SITE ID: N	**NAME:** 4B South River Terrace-1-East, 4F Barebone Tributary Ravine	**LATITUDE:** 38° 35' 02.3990"
FORMER ID: Combination 2		**LONGITUDE:** -85° 23' 48.7280"

CONCEPT: Two landfills southeast of TC Station; one north of Barebone Creek, one south.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut II due to encountering a large number of cost, logistical, safety, and socioeconomic issues.

SITE MAP: ALTERNATIVE N COMBINATION 2



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	32.3 MCY
100-YEAR FLOODPLAIN:	LANDFILL LOCATED OUTSIDE 100-YEAR FLOODPLAIN. PONDS IN 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~800 ACRES

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~800 ACRES ~$10 MILLION
CCR TRANSPORT DISTANCE:	~6,000 FT LONGER THAN RAVINE B ~$30 MILLION

ENVIRONMENTAL RESOURCES CONSIDERATIONS
STREAM, WETLAND, AND ENDANGERED SPECIES HABITAT IMPACTS.
POTENTIAL CEMETERY IMPACTS

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL AND COST CONSIDERATIONS: PROPERTY ACQUISITION (~800 ACRES) AND CCR TRANSPORT DISTANCE (~6,000 FEET LONGER THAN RAVINE B ALTERNATIVES) RESULTING IN SIGNIFICANT ADDITIONAL COST. SITE ALTERNATIVE WOULD HAVE SIGNIFICANT ADVERSE ENVIRONMENTAL CONSEQUENCES, INCLUDING IMPACTS TO STREAMS, WETLANDS AND ENDANGERED SPECIES HABITAT. ALTERNATIVE ALSO INCLUDES POND LOCATED IN 100-YEAR FLOODPLAIN AND PROXIMITY TO A PERENNIAL STREAM (BAREBONE CREEK).

NOTES:

COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B 'E ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

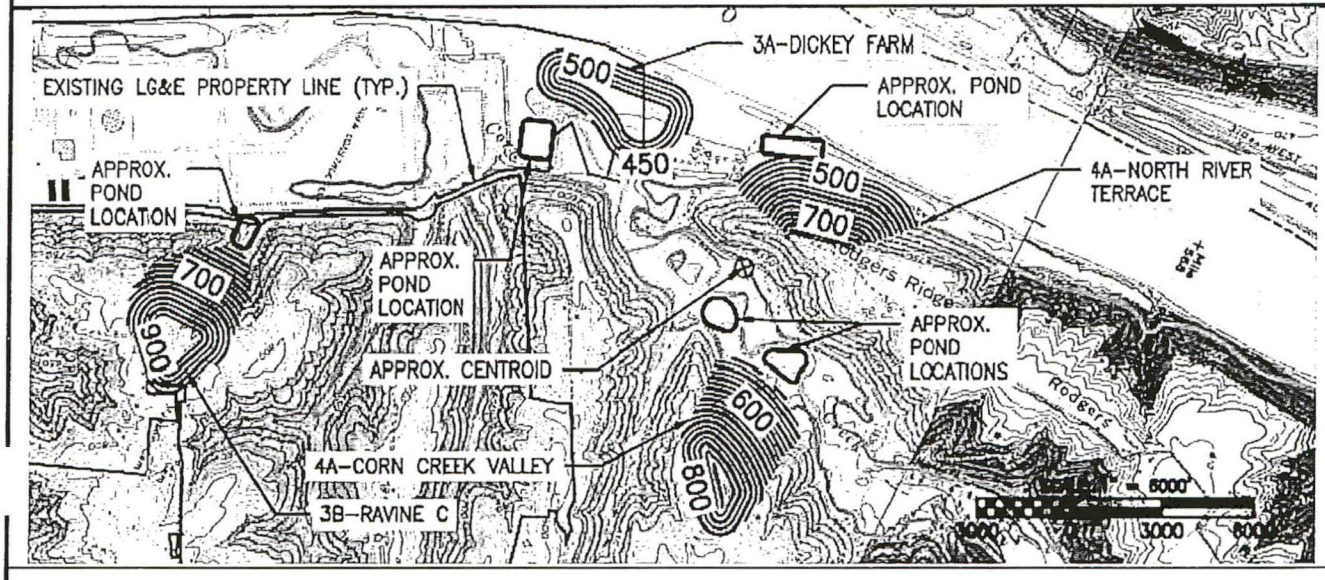
FACT SHEET O

PROJECT DESCRIPTION

SITE ID: O	NAME: 3A Dickey Farm, 3B Ravine C, 4A North River Terrace, 4A Corn Creek Valley	LATITUDE: 38° 36' 52.0675"
FORMER ID: Combination 3		LONGITUDE: -85° 25' 24.3142"

CONCEPT: Four landfills north and east of TC Station; one in Ravine C, others along Corn Creek and Ohio River.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to the high cost of four individual landfills needed to meet site capacity requirements.

SITE MAP: ALTERNATIVE O COMBINATION 3



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	33.8 MCY
100-YEAR FLOODPLAIN:	THREE LANDFILLS LOCATED WITHIN 100-YEAR FLOODPLAIN.
PROPERTY ACQUISTION:	~800 ACRES

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~800 Acres ~$10 million
ORDER OF MAGNITUDE COST OF MULTIPLE LANDFILLS:	~$2-5/CY

ENVIRONMENTAL RESOURCES CONSIDERATIONS
IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON LOCATION IN 100-YEAR FLOODPLAIN AND COST. SEE LOGISTICAL AND COST CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL CONSIDERATIONS: 100-YEAR FLOODPLAIN IMPACTS AND PROPERTY ACQUISITION (~800 ACRES). THE ALTERNATIVE WOULD ALSO BE DEEMED IMPRACTICABLE DUE TO SIGNIFICANT ADDITIONAL COST ASSOCIATED WITH THE USE OF MULTIPLE LANDFILLS. SEE APPENDIX IV.B-1 FOR ANALYSIS OF ADDITIONAL COST ASSOCIATED WITH MULTIPLE LANDFILLS.

NOTES:

COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

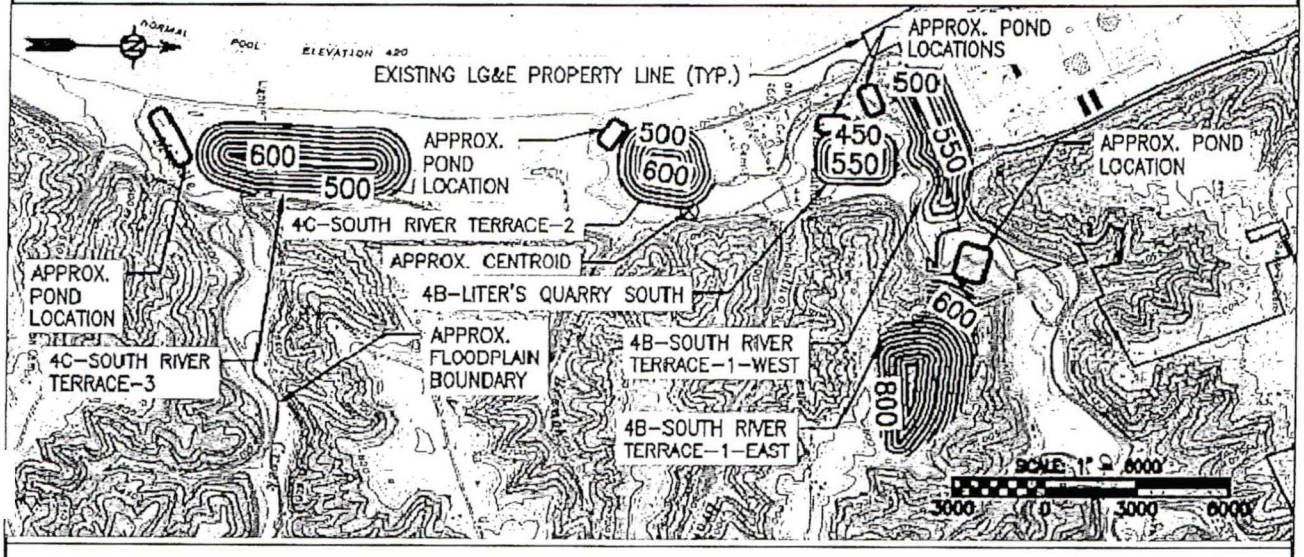
FACT SHEET P

PROJECT DESCRIPTION

SITE ID: P FORMER ID: Combination 4	NAME: 4B South River Terrace-1-East/West, 4B Liter's Quarry, 4C South River Terrace-2/3	LATITUDE: 38° 34' 04.9838" LONGITUDE: -85° 24' 09.9477"

CONCEPT: Five landfills south of TC Station; one east of Barebone Creek, the rest along the Ohio River.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor (or Barge), Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut I due to the high cost of five individual landfills needed to meet site capacity requirements.

SITE MAP: ALTERNATIVE P COMBINATION 4



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	36.9 MCY
100-YEAR FLOODPLAIN:	FOUR LANDFILLS LOCATED WITHIN 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~1000 ACRES

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~1000 Acres ~$12 million
ORDER OF MAGNITUDE COST OF MULTIPLE	~$2-5/CY

ENVIRONMENTAL RESOURCES CONSIDERATIONS
IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON LOCATION IN 100-YEAR FLOODPLAIN AND COST. SEE LOGISTICAL AND COST CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL CONSIDERATIONS: 100-YEAR FLOODPLAIN IMPACTS AND PROPERTY ACQUISITION (~1000 ACRES). THE ALTERNATIVE WOULD ALSO BE DEEMED IMPRACTICABLE DUE TO SIGNIFICANT ADDITIONAL COST ASSOCIATED WITH THE USE OF MULTIPLE LANDFILLS. SEE APPENDIX IV.B-1 FOR ANALYSIS OF ADDITIONAL COST ASSOCIATED WITH MULTIPLE LANDFILLS.

NOTES:

1. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

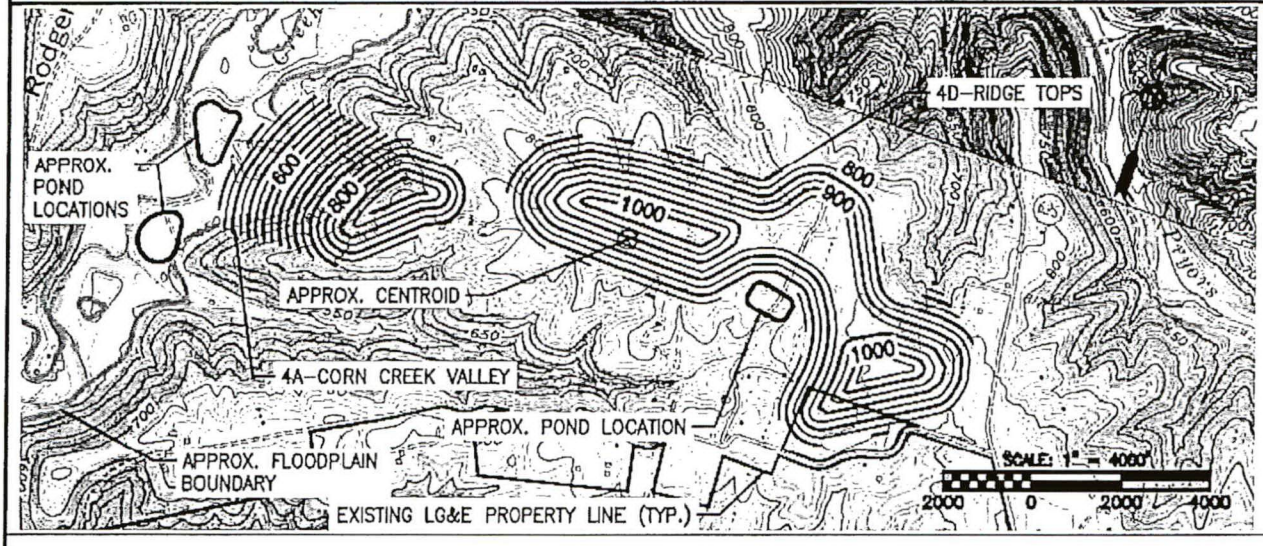
FACT SHEET Q

PROJECT DESCRIPTION

SITE ID: Q	**NAME:** 4A Corn Creek Valley, 4D Connor Ridge Road Ridge Tops	**LATITUDE:** 38° 37' 08.7096"
FORMER ID: Combination 5		**LONGITUDE:** -85° 24' 10.7756"

CONCEPT: Two landfills northeast of TC Station; one in ravine along Corn Creek, other northeast of Ravine A.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor (or Barge), Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut II due to encountering a large number of cost, logistical, safety, and socioeconomic issues.

SITE MAP: ALTERNATIVE Q COMBINATION 5



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	36.2 MCY
100-YEAR FLOODPLAIN:	ONE LANDFILL PARTIALLY LOCATED WITHIN 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~1000 ACRES (INCLUDES RESIDENCES AND PRIME FARMLAND)

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~1000 ACRES ~$12 MILLION
CCR TRANSPORT DISTANCE:	~18,000 FT LONGER THAN RAVINE B ~$75 MILLION
DOUBLE HANDLING OF CLAY BORROW MATERIAL	

ENVIRONMENTAL RESOURCES CONSIDERATIONS
QUALITY OF LIFE INCLUDING AESTHETICS AND NOISE IMPACTS
PRIME FARMLAND WOULD BE ELIMINATED
STREAMS & WETLANDS AND ENDANGERED SPECIES HABITAT IMPACTED

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT COST CONSIDERATIONS FOR PROPERTY ACQUISITION (~1000 ACRES) AND CCR TRANSPORT DISTANCE (~18,000 FT LONGER THAN RAVINE B ALTERNATIVE), AMOUNTING TO MORE THAN $2 PER CUBIC YARD IN ADDITIONAL COSTS EVEN WITHOUT TAKING INTO CONSIDERATION ADDED O&M COSTS AND COSTS FOR DOUBLE HANDLING OF CLAY. ADDITIONALLY, ENVIRONMENTAL RESOURCES CONSIDERATIONS INCLUDE STREAM/WETLAND/ENDANGERED SPECIES HABITAT IMPACTS, LOSS OF PRIME FARMLAND, AND THE QUALITY OF LIFE OF SURROUNDING RESIDENTS AND TRAVELERS. THIS SITE IS LOCATED PARTIALLY WITHIN THE 100-YEAR FLOODPLAIN AND IN CLOSE PROXIMITY TO PERENNIAL STREAM CORN CREEK, HOWEVER, THIS WAS NOT THE BASIS OF ELIMINATION.

NOTES:

1. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

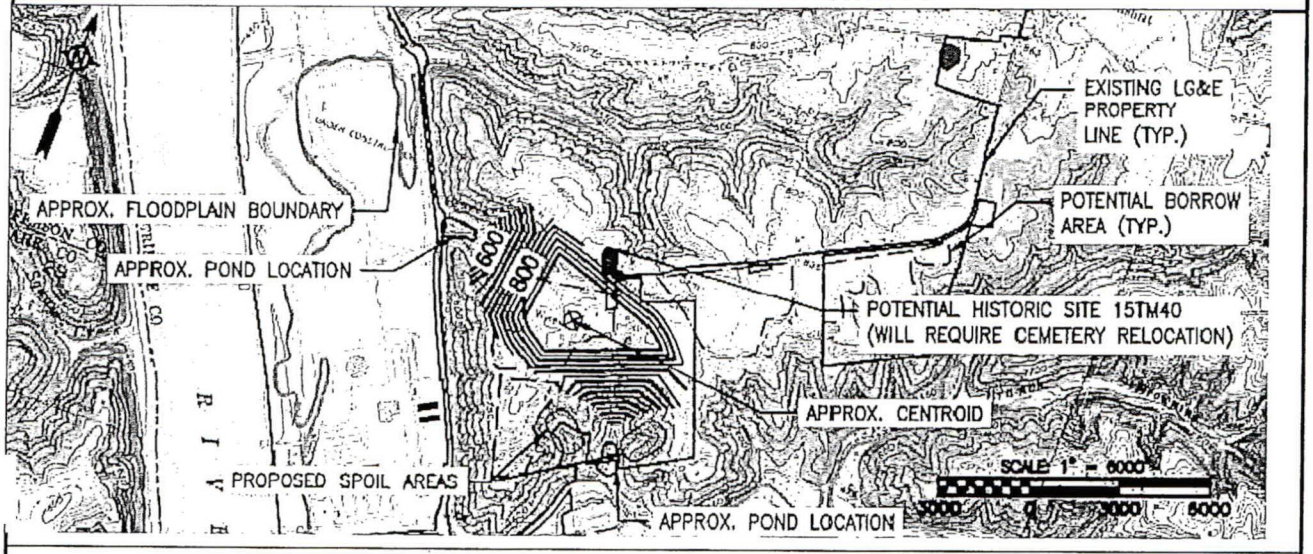
FACT SHEET R

PROJECT DESCRIPTION

SITE ID: R **FORMER ID:** Combination 6	**NAME:** 3B Ravine C, 4F Barebone Tributary Ravine	**LATITUDE:** 38° 35' 31.2321" **LONGITUDE:** -85° 24' 14.0212"

CONCEPT: One landfill east of TC Station; stretching from Ravine C into ravine north of Barebone Creek.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut III due to unacceptable cemetery impacts, excessive costs, and inadequate site capacity.

SITE MAP: ALTERNATIVE R COMBINATION 6



LOGISTICAL CONSIDERATIONS	
ITEM:	**IMPACT:**
SITE CAPACITY:	21.8 MCY
100-YEAR FLOODPLAIN:	LANDFILL IS OUTSIDE 100-YEAR FLOODPLAIN.
CEMETERY RELOCATION	

COST CONSIDERATIONS[1]	
ADDITIONAL CONSTRUCTION AND OPERATIONS COSTS:	~$2/CY

ENVIRONMENTAL RESOURCES CONSIDERATIONS
IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON LOGISTICAL AND COST CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL AND COST CONSIDERATIONS: CEMETERY IMPACTS AND ADDITIONAL CONSTRUCTION AND OPERATIONS COSTS.

NOTES:

1. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL COSTS ASSOCIATED WITH THIS ITEM. ADDITIONAL CONSTRUCTION AND OPERATIONS COSTS OF ~$2/CY BASED ON COST COMPARISON COMPLETED IN CUT III ANALYSIS OF JANUARY 2014 ALTERNATIVES ANALYSIS REPORT.

2. ALTERNATIVE SIZE IS CONSTRAINED VERTICALLY TO MINIMIZE AESTHETIC IMPACTS TO THE SURROUNDING RESIDENTS. THE FOOTPRINT SIZE IS CONSTRAINED TO LIMIT DRAINAGE TO TWO RAVINES, THUS REDUCING STREAM/WETLAND IMPACTS.

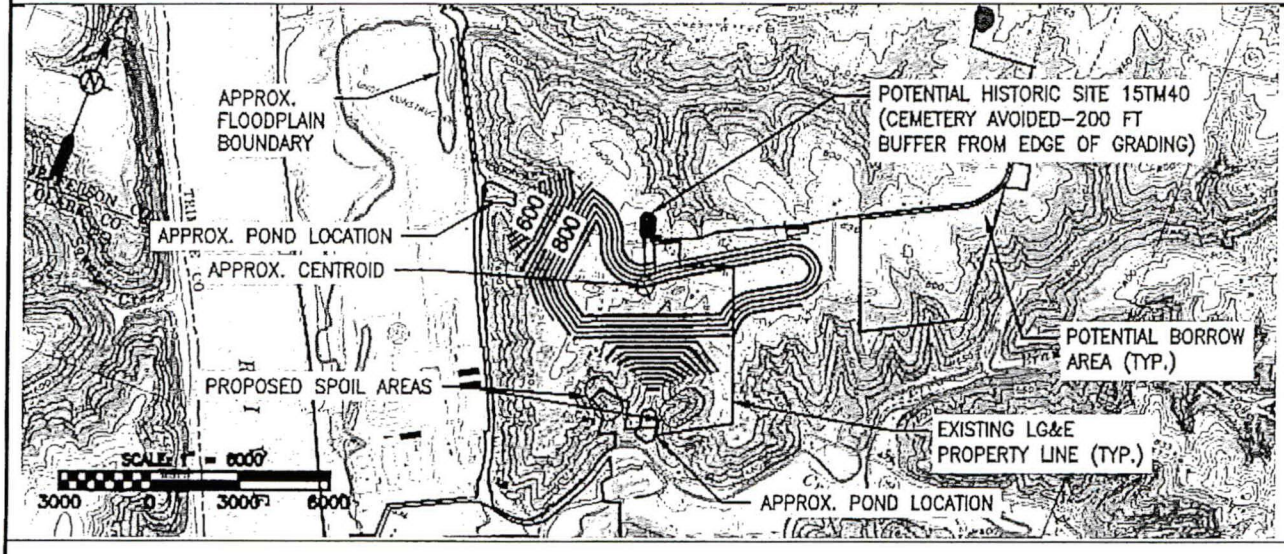
FACT SHEET S

PROJECT DESCRIPTION

SITE ID: S	**NAME:** 3B Ravine C, 4F Barebone Tributary Ravine-Cemetary Avoidance	**LATITUDE:** 38° 35' 33.1970"
FORMER ID: Combination 6-Cemetery Avoidance		**LONGITUDE:** -85° 24' 07.5880"

CONCEPT: One landfill east of TC Station; stretching from Ravine C into ravine north of Barebone Creek, avoiding cemetery.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut III due to excessive costs.

SITE MAP: ALTERNATIVE S COMBINATION 6-CEMETERY AVOIDANCE



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	24.3 MCY
100-YEAR FLOODPLAIN:	LANDFILL IS OUTSIDE 100-YEAR FLOODPLAIN.
PROPERTY AQCUISITION:	~500 ACRES

COST CONSIDERATIONS[1]	
ADDITIONAL CONSTRUCTION AND OPERATIONS COSTS:	~$3/CY

ENVIRONMENTAL RESOURCES CONSIDERATIONS
STREAM, WETLAND, AND ENDANGERED SPECIES HABITAT IMPACTS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL AND COST CONSIDERATIONS: PROPERTY ACQUISITION (~500 ACRES) AND ADDITIONAL CONSTRUCTION AND OPERATIONS COSTS. SITE ALTERNATIVE WOULD HAVE SIGNIFICANT ADVERSE ENVIRONMENTAL CONSEQUENCES, INCLUDING IMPACTS TO STREAMS, WETLANDS AND ENDANGERED SPECIES HABITAT.

NOTES:

1. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL COSTS ASSOCIATED WITH THIS ITEM. ADDITIONAL CONSTRUCTION AND OPERATIONS COSTS OF ~$3/CY BASED ON COST COMPARISON COMPLETED IN CUT III ANALYSIS OF JANUARY 2014 ALTERNATIVES ANALYSIS REPORT.

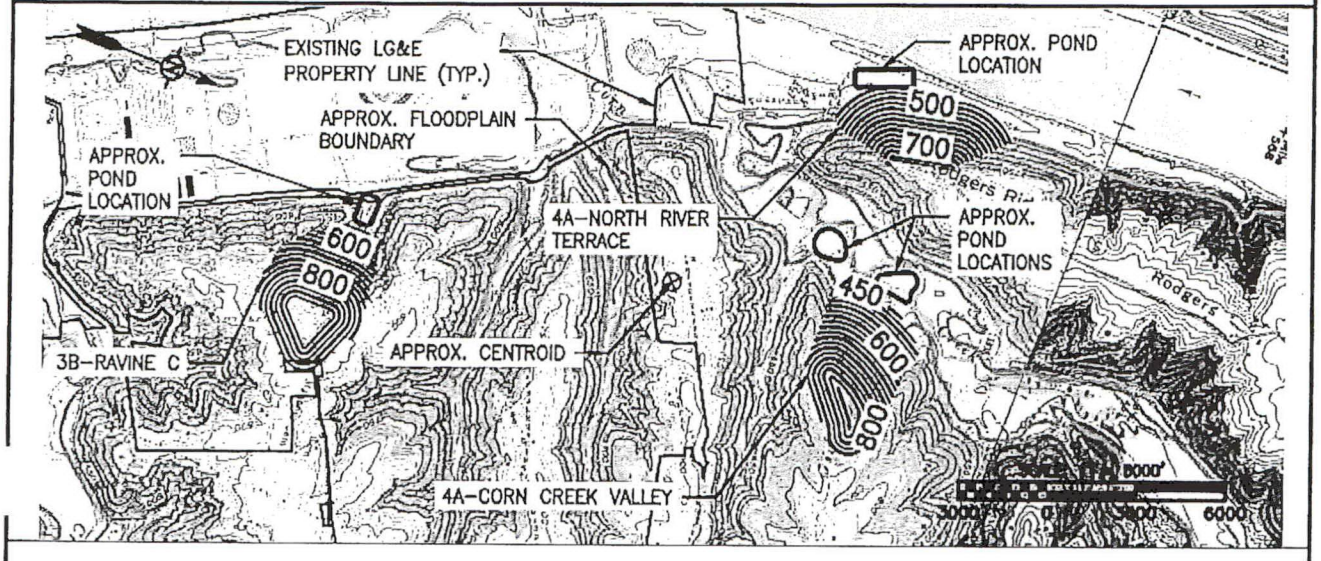
FACT SHEET T

PROJECT DESCRIPTION

SITE ID: T	NAME: 3B Ravine C, 4A North River Terrace, Corn Creek Valley	LATITUDE: 38° 36' 29.7147"
FORMER ID: Combination 11		LONGITUDE: -85° 24' 54.2097"

CONCEPT: Three landfills; one east of TC Station in Ravine C, the others north along Ohio River and Barebone Creek.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut II due to encountering a large number of cost, logistical, safety, and socioeconomic issues.

SITE MAP: ALTERNATIVE T COMBINATION 11



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	27.7 MCY
100-YEAR FLOODPLAIN:	TWO LANDFILLS ARE PARTIALLY WITHIN 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~800 ACRES

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~800 ACRES ~10 MILLION
ORDER OF MAGNITUDE COST OF MULTIPLE LANDFILLS:	~$2-5/CY

ENVIRONMENTAL RESOURCES CONSIDERATIONS
IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON LOGISTICAL AND COST CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL AND COST CONSIDERATIONS: PROPERTY ACQUISITION (~800 ACRES) AND ADDITIONAL COST DUE TO REQUIREMENT OF THREE INDIVIDUAL LANDFILLS. SEE APPENDIX IV.B-1 FOR ANALYSIS OF ADDITIONAL COST ASSOCIATED WITH MULTIPLE LANDFILLS.

NOTES:

1. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

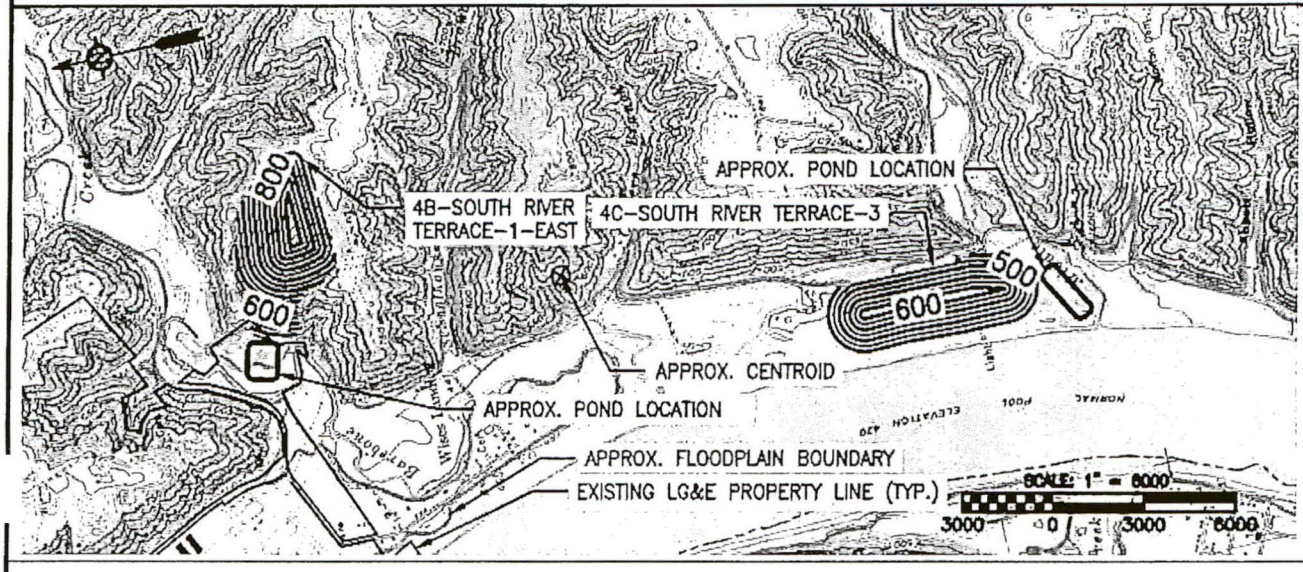
FACT SHEET U

PROJECT DESCRIPTION

ITE ID: U FORMER ID: Combination 12	NAME: 4B South River Terrace-1-East, 4C South River Terrace-3	LATITUDE: 38° 34' 00.7914" LONGITUDE: -85° 23' 56.5396"

CONCEPT: Two landfills south of TC Station; one along Barebone Creek, the other south along the Ohio River.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor (or Barge), Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut II due to encountering a large number of cost, logistical, safety, and socioeconomic issues.

SITE MAP: ALTERNATIVE U COMBINATION 12



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	27.9 MCY
100-YEAR FLOODPLAIN:	ONE LANDFILL IS LOCATED WITHIN 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~1000 ACRES

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~1000 ACRES ~$12 MILLION
CCR TRANSPORT DISTANCE:	~14,000 FT LONGER THAN RAVINE B ~$60 MILLION

ENVIRONMENTAL RESOURCES CONSIDERATIONS
IMPACTS NOT CONSIDERED BECAUSE SITE IS ELIMINATED BASED ON LOGISTICAL AND COST CONSIDERATIONS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL AND COST CONSIDERATIONS: 100-YEAR FLOODPLAIN IMPACTS, PROPERTY ACQUISITION (~1000 ACRES), AND CCR TRANSPORT DISTANCE (~14,000 FT LONGER THAN RAVINE B ALTERNATIVES), AMOUNTING TO MORE THAN $2 PER CUBIC YARD EVEN WITHOUT TAKING INTO CONSIDERATION ADDED O&M COSTS.

NOTES:

1. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

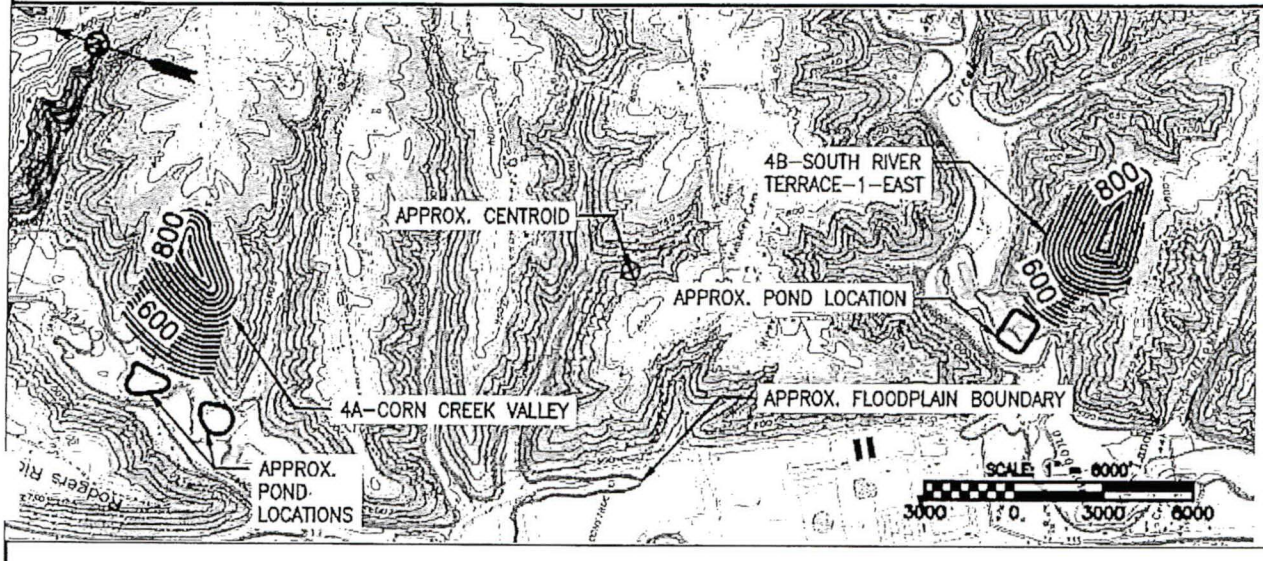
FACT SHEET V

PROJECT DESCRIPTION

SITE ID: V	NAME: 4A Corn Creek Valley, 4B South River Terrace-1-East	LATITUDE: 38° 35' 54.9491"
FORMER ID: Combination 13		LONGITUDE: -85° 24' 15.6938"

CONCEPT: Two landfills east of TC Station; one north along Corn Creek, the other along Barebone Creek to the south.	**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck	**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut II due to encountering a large number of cost, logistical, safety, and socioeconomic issues.

SITE MAP: ALTERNATIVE V COMBINATION 13



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	29.8 MCY
100-YEAR FLOODPLAIN:	ONE LANDFILL IS PARTIALLY WITHIN 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~1000 ACRES

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~1000 ACRES ~$12 MILLION
CCR TRANSPORT DISTANCE:	~12,000 FT LONGER THAN RAVINE B ~$50 MILLION

ENVIRONMENTAL RESOURCES CONSIDERATIONS
STREAM, WETLAND, AND ENDANGERED SPECIES HABITAT IMPACTS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT COST CONSIDERATIONS: PROPERTY ACQUISITION (~1,000 ACRES) AND CCR TRANSPORT DISTANCE (~12,000 FEET LONGER THAN RAVINE B ALTERNATIVES), AMOUNTING TO MORE THAN $2 PER CUBIC YARD IN ADDITIONAL COSTS EVEN WITHOUT TAKING INTO CONSIDERATION ADDED O&M COSTS. ADDITIONALLY, ENVIRONMENTAL RESOURCES CONSIDERATIONS INCLUDE STREAM/WETLAND/ENDANGERED SPECIES HABITAT IMPACTS. THIS SITE IS LOCATED PARTIALLY WITHIN THE 100-YEAR FLOODPLAIN AND IN CLOSE PROXIMITY TO PERENNIAL STREAMS BAREBONE CREEK AND CORN CREEK, HOWEVER, THIS WAS NOT THE BASIS OF ELIMINATION.

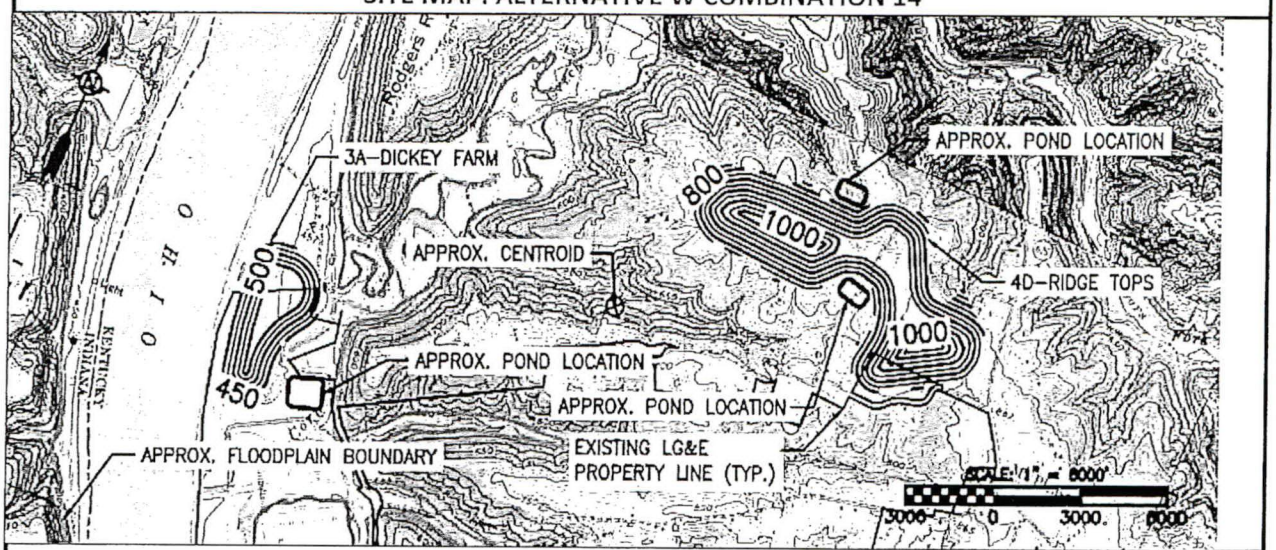
OTES:

COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

FACT SHEET W

PROJECT DESCRIPTION		
SITE ID: W **FORMER ID:** Combination 14	**NAME:** 4D Ridge Tops, 3A Dickey Farm	**LATITUDE:** 38° 36' 48.2687" **LONGITUDE:** -85° 24' 34.7531"
CONCEPT: Two landfills north and east of TC Station; one along Ohio River, one on a ridge top northeast of Ravine A.		**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck		**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut II due to encountering a large number of cost, logistical, safety, and socioeconomic issues.

SITE MAP: ALTERNATIVE W COMBINATION 14



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	30.0 MCY
100-YEAR FLOODPLAIN:	ONE LANDFILL IS LOCATED WITHIN 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~800 ACRES (INCLUDES RESIDENCES AND PRIME FARMLAND)

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~800 ACRES ~$10 MILLION
CCR TRANSPORT DISTANCE:	~13,000 FT LONGER THAN RAVINE B ~$50 MILLION
DOUBLE HANDLING OF CLAY BORROW MATERIAL.	

ENVIRONMENTAL RESOURCES CONSIDERATIONS
QUALITY OF LIFE INCLUDING AESTHETICS AND NOISE IMPACTS
PRIME FARMLAND WOULD BE ELIMINATED

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT LOGISTICAL AND COST CONSIDERATIONS: IMPACTS TO THE 100-YEAR FLOODPLAIN, PROPERTY ACQUISITION (~800 ACRES), AND CCR TRANSPORT DISTANCE (~13,000 FT LONGER THAN RAVINE B ALTERNATIVES), AMOUNTING TO $2 PER CUBIC YARD IN ADDITIONAL COSTS EVEN WITHOUT TAKING INTO CONSIDERATION ADDED O&M COSTS AND COSTS FOR DOUBLE HANDLING OF CLAY. ADDITIONALLY, ENVIRONMENTAL RESOURCES CONSIDERATIONS INCLUDE THE QUALITY OF LIFE OF SURROUNDING RESIDENTS AND TRAVELERS AND LOSS OF PRIME FARMLAND.

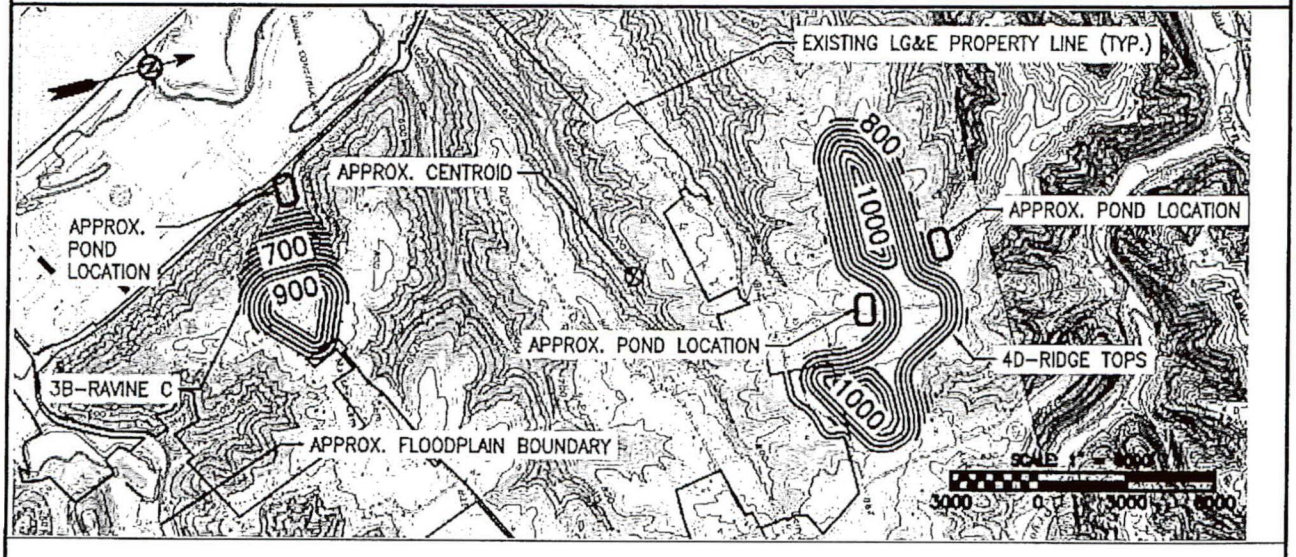
NOTES:

1.COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

FACT SHEET X

PROJECT DESCRIPTION		
SITE ID: X **FORMER ID:** Combination 16	**NAME:** 4D Connor Ridge Road Ridge Tops, 3B Ravine C	**LATITUDE:** 37° 21' 42.7493" **LONGITUDE:** -89° 53' 48.5201"
CONCEPT: Two landfills east of TC Station; one in Ravine C, the other on a ridge top northeast of Ravine A.		**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck		**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut II due to encountering a large number of cost, logistical, safety, and socioeconomic issues.

SITE MAP: ALTERNATIVE X COMBINATION 16



LOGISTICAL CONSIDERATIONS	
ITEM:	**IMPACT:**
SITE CAPACITY:	32.6 MCY
100-YEAR FLOODPLAIN:	LANDFILLS ARE OUTSIDE 100-YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~800 ACRES (INCLUDES RESIDENCES AND PRIME FARMLAND)

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~800 ACRES ~$10 MILLION
CCR TRANSPORT DISTANCE:	~10,000 FT LONGER THAN RAVINE B ~$40 MILLION
DOUBLE HANDLING OF CLAY BORROW MATERIAL	

ENVIRONMENTAL RESOURCES CONSIDERATIONS
QUALITY OF LIFE INCLUDING AESTHETICS AND NOISE IMPACTS
PRIME FARMLAND WOULD BE ELIMINATED
STREAM, WETLAND, AND ENDANGERED SPECIES HABITAT IMPACTS.

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT COST CONSIDERATIONS: PROPERTY ACQUISITION (~800 ACRES) AND CCR TRANSPORT DISTANCE (~10,000 FT LONGER THAN RAVINE B ALTERNATIVES). ADDITIONALLY, ENVIRONMENTAL RESOURCES CONSIDERATIONS INCLUDE THE QUALITY OF LIFE OF SURROUNDING RESIDENTS AND TRAVELERS, LOSS OF PRIME FARMLAND, AND STREAM, WETLAND AND ENDANGERED SPECIES HABITAT IMPACTS.

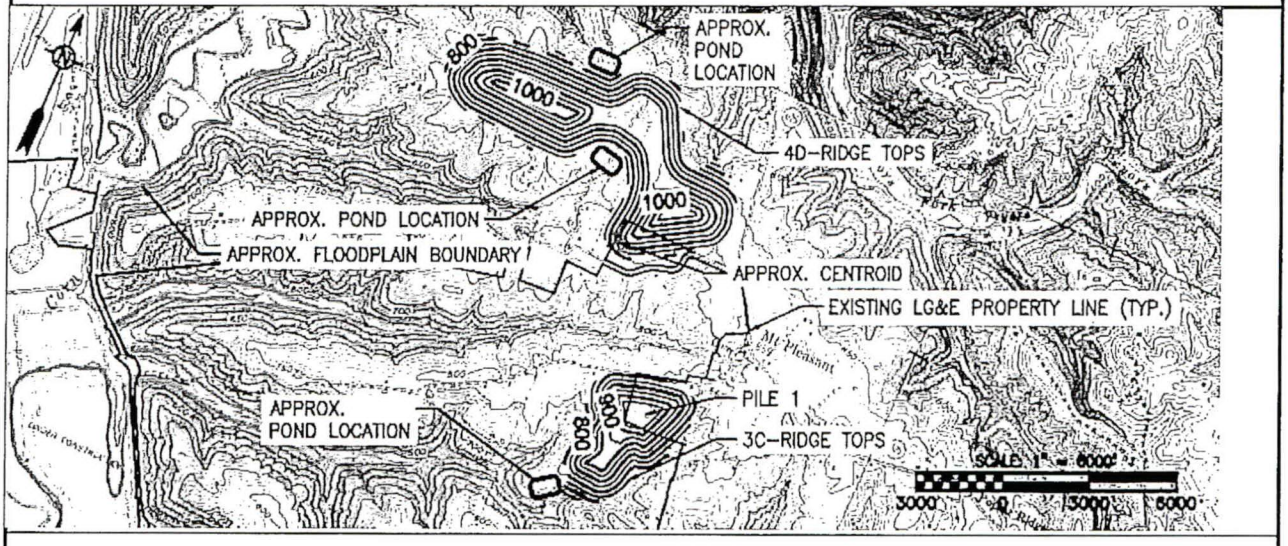
NOTES:

1. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

FACT SHEET Y

PROJECT DESCRIPTION		
SITE ID: Y	**NAME:** 4D Connor Ridge Road Ridge Tops, 3C Ridge Tops (Landfill-1 Only)	**LATITUDE:** 38° 36' 55.8786"
FORMER ID: Combination 17		**LONGITUDE:** -85° 23' 39.5533"
CONCEPT: Two landfills on ridge tops northeast and southeast of Ravine A, east of TC Station.		**ANCILLARY FACILITIES:** ES/SWM and Leachate Ponds. Others not shown on Site Map.
PRIMARY TRANSPORT: Pipe Conveyor, Truck		**ALTERNATIVES ANALYSIS (AA) OUTCOME:** Eliminated in Cut II due to encountering a large number of cost, logistical, safety, and socioeconomic issues.

SITE MAP: ALTERNATIVE Y COMBINATION 17



LOGISTICAL CONSIDERATIONS	
ITEM:	IMPACT:
SITE CAPACITY:	31.1 MCY
100-YEAR FLOODPLAIN:	LANDFILLS ARE OUTSIDE 100 YEAR FLOODPLAIN.
PROPERTY ACQUISITION:	~800 ACRES (INCLUDES RESIDENCES AND PRIME FARMLAND)

COST CONSIDERATIONS[1]	
PROPERTY ACQUISITION:	~800 ACRES ~$10 MILLION
CCR TRANSPORT DISTANCE:	~10,000 FT LONGER THAN RAVINE B ~$40 MILLION
DOUBLE HANDLING OF CLAY BORROW MATERIAL	

ENVIRONMENTAL RESOURCES CONSIDERATIONS
QUALITY OF LIFE INCLUDING AESTHETICS AND NOISE IMPACTS
PRIME FARMLAND WOULD BE ELIMINATED

COMMENTS AND CONCLUSIONS:

SITE ALTERNATIVE IS NOT PRACTICABLE DUE TO SIGNIFICANT COST CONSIDERATIONS: PROPERTY ACQUISITION (~800 ACRES) AND CCR TRANSPORT DISTANCE (~10,000 FT LONGER THAN RAVINE B ALTERNATIVES). ADDITIONALLY, ENVIRONMENTAL RESOURCES CONSIDERATIONS INCLUDE THE QUALITY OF LIFE OF SURROUNDING RESIDENTS AND TRAVELERS AND LOSS OF PRIME FARMLAND.

NOTES:

1. COST CONSIDERATIONS LISTED ABOVE INCLUDE ITEMS THAT WOULD BE AN ADDITIONAL CAPITAL COST WHEN COMPARED TO A RAVINE B SITE ALTERNATIVE. THE ESTIMATE IS THE APPROXIMATE ORDER OF MAGNITUDE OF ADDITIONAL CAPITAL COSTS ASSOCIATED WITH THIS ITEM, AND DOES NOT INCLUDE ESTIMATES OF ADDITIONAL OPERATION AND MAINTENANCE (O&M) COSTS.

APPENDIX IV.B-1.
Order of Magnitude Cost of Multiple Landfill Sites

SUPPLEMENT TO \IATIVES ANALYSIS
Appendix IV.B-1. Order of Ma 1e Cost of Multiple Landfill Sites
Sun Sheet

This Appendix provides justification for additional costs associated with multiple (three or more) landfill sites when compared to one individual landfill. It can be shown that as the number of individual landfill sites per Site Alternative increased, the cost per cubic yard ($/CY) for that Alternative would also increase. GAI reviewed three Site Alternatives: Ravine B (1 landfill), Combination 11 (3 landfills), and Combination 1 (6 landfills) to estimate this increase in cost. The project elements anticipated to result in the largest cost increase were considered in this Appendix (e.g. haul road lengths, pipe conveyor lengths and number of tranfer stations, and landfill construction components). The estimated range of the increase in cost ($/CY) is summarized below and a description of how these costs were calculated is provided on the following pages.

Range of Cost for Haul Road, Pipe Conveyor, and Landfill [1]												
	Haul Road ($/CY) [2]			Pipe Conveyor ($/CY) [3]			Landfill ($/CY) [4]			Total Cost ($/CY)		
1 Landfill	$0.24	-	$0.36	$0.30	-	$0.44	$0.72	-	$1.08	**$1.26**	-	**$1.88**
3 Landfills	$0.81	-	$1.21	$1.04	-	$1.56	$1.26	-	$1.88	**$3.10**	-	**$4.66**
6 Landfills	$1.01	-	$1.51	$1.27	-	$1.91	$1.90	-	$2.84	**$4.18**	-	**$6.26**

haul[2]	pipe[3]	landfill[4]
$0.30	$0.37	$0.90
$1.01	$1.30	$1.57
$1.26	$1.59	$2.37

Difference from 3 Landfills to 1 Landfill: $1.85 to $2.77

Difference from 6 Landfills to 1 Landfill: $2.92 to $4.38

Say: $2 to $5

Notes:
1. Range of each component (Haul Road, Pipe Conveyor, and Landfill) includes a 20% contingency (for example if Haul Road Cost was calculated as $1.00/CY, the range would be $0.80 to $1.20)
2. See Haul Road Order of Magnitude Cost Estimate
3. See Pipe Conveyor Order of Magnitude Cost Estimate
4. See Landfill Order of Magnitude Cost Estimate
5. The costs included in this estimate are not meant to be all-inclusive. Only the Haul Road, Pipe Conveyor, and Landfill System costs were included in this estimate to provide an 'order of magnitude' estimate of the potential cost differences between a single landfill and multiple independant smaller sites.

1 Landfill – Ravine B

The haul road layout was determined based on the current design of the Trimble County Generating Station Landfill Project (Trimble). The haul road is approximately 5,500 feet (ft) total, including an approximately 200 foot long bridge. The bridge is at the beginning of the haul road from the generating station over State Highway 1838 to an adjacent hillside. The haul road continues up the hillside to the ridge top where it eventually reaches the proposed footprint of the landfill. The cost per linear foot of haul road was estimated to be $1,600 and the cost of a bridge was approximated to be $1,750,000. Therefore, the total cost of a haul road for Ravine B is estimated to be (5,500 LF -200 LF = 5,300 LF X $1,600/LF = $8,480,000. 1 Bridge X $1,750,000/Bridge = $1,750,000. $8,480,000 + $1,750,000 =) $10,230,000. Preliminary grading of Ravine B shows that the landfill volume is 34.2 MCY.

Cost per CY = $10.23 million / 34.2 MCY = $0.30/CY

3 Landfills - Combination 11 – 3B & 4A

Combination 11 is comprised of 3 proposed landfill sites. The approximate length of haul road needed is 14,800 ft, including three approximately 200 ft long bridges. Accessing the Ravine C site requires a bridge to cross haul trucks from the generating station to the adjacent hillside. The haul road would then continue along the ridge to LG&E's property line. It would follow the property line to Ogden Ridge Road and continue south parallel to Ogden Ridge Road. The haul road would remain parallel to Ogden Ridge Road following the right turn along the ridge top to lead to Ravine C. Accessing the two sites of Option 4A consists of a bridge to cross Corn Creek on to the Dickey Farm property. The haul road would continue on to an existing trail to be converted to a haul road. Another haul road would break off prior to the bridge to stay upstream of Corn Creek and prevent numerous crossings. This road would continue to the second site of Option 4A eventually requiring a bridge to cross a tributary of Corn Creek. The cost per linear foot of haul road was estimated to be $1,600 and the cost of the three bridges was approximated to be $1,750,000 each. Therefore, the total cost of a haul road for Combination 11 is estimated to be (14,800 LF - (200 LF X 3) = 14,200 LF X $1,600/LF = $22,720,000. 3 Bridges X $1,750,000/bridge = $5,250,000. $22,720,000 + $5,250,000 =) $27,970,000. Preliminary grading of Combination 11 shows that the landfill volume is 27.7 MCY.

Cost per CY = $27.97 million / 27.7 MCY = $1.01/CY

6 Landfills - Combination 1 – 3A, 3B, & 3C

This Combination consists of a total of 6 landfill sites. The total length of haul roads required is approximately 20,000 ft, including two approximately 200 ft long bridges. The bridge is at the beginning of the haul road from the Trimble County Generating Station over State Highway 1838 to the adjacent hillside. A small bridge is required to access the 3A Dickey Farm area by crossing Corn Creek. The cost per linear foot of haul road was estimated to be $1,600 and the cost of the bridges was approximated to be $1,750,000 each. Therefore, the total cost of a haul road for Combination 1 is estimated to be (20,000 LF - (2 X 200 LF) = 19,600 LF X $1,600/LF = $31,360,000. 2 Bridges X $1,750,000/Bridge = $3,500,000. $31,360,000 + $3,500,000 =) $34,860,000. Preliminary grading of Combo 1 shows that the landfill volume is 29.1 MCY.

Cost per CY = $34.86 million / 27.6 MCY = $1.26/CY

1 Landfill – Ravine B

The pipe conveyor layout for Ravine B is approximately 5,236 ft in length. The tail end of the pipe conveyor is located on the eastern side of the Trimble County (TC) Station. The pipe conveyor is proposed to cross State Highway 1838 parallel to the haul road to the adjacent hillside. The pipe conveyor continues to the east towards the landfill footprint, eventually paralleling Ogden Ridge Road before terminating just west of the landfill. The cost per-linear-foot of pipe conveyor was estimated to be $2,425. Therefore, the estimated cost of a pipe conveyor for Ravine B is projected to be (5,236 ft X $2,425/ft =) $12,697,300.

Cost per CY = $12.70 million / 34.2 MCY = $0.37/CY

3 Landfills - Combination 11 – 3B & 4A

Combination Option 11 consists of 3 sites; 2 of which are located north of the generating station and 1 located east of the TC Station. This Option requires three sections of pipe conveyors, Section 1 to service the Ravine C landfill and Section 2A and 2B to service the 4A landfill piles. The total length of pipe conveyor is approximately 14,800 feet. Section 1 of the pipe conveyor to service Ravine C is approximately 3,000 ft long. This pipe conveyor also begins on the east side of the TC Station. The pipe conveyor crosses KY State Road 1838 and climbs the hill to the south of the Ravine C footprint. Section 1 terminates on the ridgetop just south of the Ravine C landfill footprint. Section 2A to the North River Terrace is approximately 8,500 ft long. This pipe conveyor layout begins midway on the east side of the TC Station. It runs north along the berms of the bottom ash and gypsum storage ponds. At the end of the gypsum storage pond the pipe conveyor crosses Corn Creek. The pipe conveyor continues for approximately 1,300 ft then bears north to the termination location just south of the North River Terrace landfill footprint. Section 2B is approximately 3,300 ft long and crosses Corn Creek to discharge near the Corn Creek Valley Landfill. It is assumed 1 transfer station would be required, at the termination of Section 2A. Sections 2A and 2B are located entirely within the floodplain. Not included in this cost is the additional cost anticipated with crossing streams and construction within the floodplain. The cost per-linear-foot of pipe conveyor was assumed to be the same as the Ravine B option at $2,425/ft. Therefore, the estimated total cost of a pipe conveyor for Combination 11 is projected to be (14,800 ft X $2,425/ft = $35,890,000. 1 transfer station at $250,000 each. $35,890,000 + $250,000 =) $36,140,000.

Cost per CY = $36.14 million / 27.7 MCY = $1.30/CY

6 Landfills - Combination 1 – 3A, 3B, & 3C

Combination 1 includes 6 total proposed landfill sites. It is assumed these sites would be constructed and developed in sequence, meaning one site will be constructed and operational at a time. Therefore, though this option consists of 4 sections of pipe conveyor, only one section at a time would be operational. Section 1, to landfill 3A, is 5,650 ft in length. It begins midway on the east side of the TC Station and follows State Highway 1838 North along the berms of the bottom ash and gypsum storage ponds. The CCRs are deposited a few hundred feet from the proposed landfill footprint. This section of pipe conveyor includes crossing Corn Creek and is located within the floodplain. Section 2A of the pipe conveyor is the same layout as Section 1 of the pipe conveyor described in Combination 11 to the Ravine C site. Section 2A of the pipe conveyor is approximately 3,000 ft long. This pipe conveyor also begins midway on the east side of the TC Station. Section 2A crosses KY State Road 1838 and climbs the hill to the south of the Ravine C footprint. This section of the pipe conveyor terminates on the ridgetop just south of the Ravine C landfill footprint. Once Ravine C is complete Section 2B of the pipe conveyor continues along the ridge along the east of the Ravine C landfill footprint. Section 2B would then turn to the east paralleling Ogden Ridge Road to the south before terminating on the ridgetop west of 3C Site 2. Section 2B of the pipe conveyor is approximately 4,900 ft long. Section 2C of the pipe conveyor would go northeast of the 2B termination point until it crosses Ogden Ridge Road. Section 2C would then parallel Ogden Ridge Road to its termination point just short of the 3C Site 1 landfill footprint. Section 2C is approximately 4,300 ft long. It is assumed 2 transfer stations would be required, at the terminations of Sections 2A and 2B. Transfer stations are estimated to be $250,000 each. Additional cost associated with construction of two separate pipe conveyors and the three phases of Section 2, are not included in this cost estimate. Also not included in this cost is the additional cost anticipated with crossing Corn Creek and construction within the floodplain. The total length of proposed pipe conveyor is 17,850 ft. The cost per-linear-foot of pipe conveyor was assumed to be the same as the Ravine B option at $2,425/LF. Therefore, the estimated total cost of pipe conveyors for Combination 1 is projected to be (17,850 ft X $2,425/ft = $43,286,250. 2 Transfer station at $250,000 each = $500,000. $43,286,250 + $500,000 =)$43,786,250.

Cost per CY = $43.79 million / 27.6 MCY = $1.59/CY

Landfill Cost Analysis

GAI has analyzed the cost per cubic yard (CY) of numerous landfill construction components of each landfill site to determine if the increase in number of landfill sites results in an increase in total landfill cost. For each site alternative, the volumes (CY) and areas (acres) for each landfill site were calculated and totaled. The landfill cost items considered were: lining ($90,000/acre), final cover ($33,000/acre), underdrain pipes ($6,000/acre), and leachate collection system pipes ($15,000/acre). An estimated nominal cost of $144,000/acre was used with the volume and area values to calculate a cost per CY of storage volume. Additionally, multiple sites would require separate facilities to capture and treat sediment/stormwater and leachate. The number of pond systems was approximated for each of the options below based on topography. Pond systems were estimated to cost $3,000,000 each. The calculations below show that the resulting costs increased as the number of landfill sites per alternative increased due to less space-efficient placement (i.e. multiple smaller footprints resulted in less volume per acreage).

1 Landfill – Ravine B

Site Alternative Ravine B consists of one site with a total volume of 34.2 MCY and a landfill area of 194 acres. This Site Alternative includes one pond system. The total landfill cost is estimated to be (194 acres X $144,000/acre = $27,936,000. 1 Pond system at $3,000,000 each. $27,936,000 + $3,000,000 =) $30,936,000.

Cost per CY = $30.94 million / 34.2 MCY = $0.90/CY

3 Landfills - Combination 11 – 3B & 4A

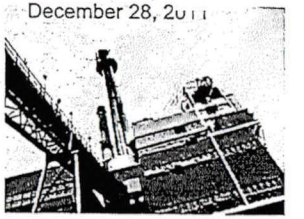
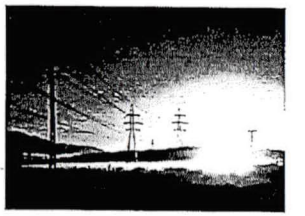
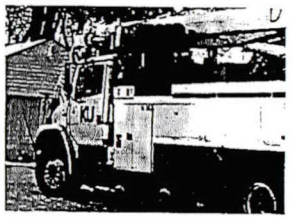
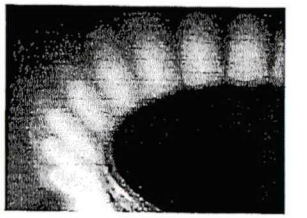
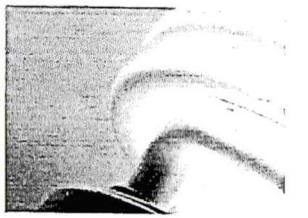
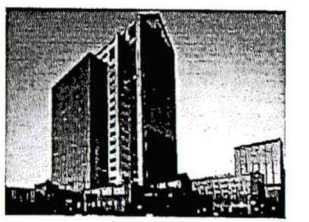
Combination Site 11-Ravine C, North River Terrace, and Corn Creek Valley consists of three sites with a total volume of 27.7 MCY and a total landfill area of 219 acres. This Site Alternative includes 4 pond systems. The total landfill cost is estimated to be (219 acres X $144,000/acre = $31,536,000. 4 Pond systems at $3,000,000 each = $12,000,000. $31,536,000 + $12,000,000 =) $43,536,000.

Cost per CY = $43.54 million / 27.7 MCY = $1.57/CY

6 Landfills - Combination 1 – 3A, 3B, & 3C

Combination Site 3-Dickey Farm, Ravine C, and Ridge Tops consists of six piles with a total volume of 27.6 MCY and a total landfill area of 308 acres. This Site Alternative includes 7 pond systems. The total landfill cost is estimated to be (308 acres X $144,000 = $44,352,000. 7 Pond systems at $3,000,000 each = $21,000,000. $44,352,000 + $21,000,000 =) $65,352,000.

Cost per CY = $65.35 million / 27.6 MCY = $2.37/CY

LG&E KU

PPL companies

Trimble County Station

TC2 Overview and Update
for
the IMEA Annual Meeting

Tom Crutcher – General Manager Trimble County Station
October 22, 2011

•Trimble County Station Combustion Byproducts

Combustion By-Product Beneficial Re-Use

- ***Flyash*** *(used as a cement filler and cement kiln feedstock)*
  - Recently signed a long-term (15-year base)contract to beneficially re-use most (40 – 95%) of flyash generated by TC1 and TC2 (barge).
- ***Gypsum*** *(used to manufacture wallboard)*
  - Recently signed a long-term (20-year base) contract to remove a minimum of 50% of the gypsum generated by TC1 and TC2 (barge).
- ***Bottom Ash*** *(used to manufacture blasting grit and roofing shingles)*
  - Currently have a contract in place which has resulted in the beneficial re-use bottom ash generated by TC1 (truck).
- ***Ash Pond Life Extension***
  - Biggest benefit provided by combustion byproduct beneficial re-use is it extends byproduct disposal pond life, thereby postponing construction of additional disposal ponds (which require significant capital investment and are subject to environmental scrutiny)

LG&E KU
PPL companies

INNOVATIVE SOLUTIONS & SUPERIOR SERVICE

(http://charah.com)

Charah, Inc. Secures Multiple Ash Marketing Contracts with LG&E and KU Facilities

Posted November 24th, 2014

Multi-plant agreements ensure reliable supply for region's ready mix concrete producers

LOUISVILLE, KY (November 24, 2014) – Charah®, Inc. (http://charah.com), a total solutions company providing unparalleled service and innovation for the coal-fired electric utility industry, today announced that it has entered into or renewed multiple agreements to manage and beneficially use the coal combustion products (CCPs) produced by several Louisville Gas and Electric Company and Kentucky Utilities Company (LG&E and KU) facilities.

Charah has entered into a long term agreement to sell and actively market fly ash from three LG&E and KU facilities including Mill Creek Generating Station in southwest Jefferson County, Trimble County Generating Station, 50 miles northeast of Louisville in Trimble County, and Ghent Generating Station northeast of Carrollton, Kentucky. Charah expects to market the fly ash from all three generating facilities to ready mix concrete producers

to market the fly ash from all three generating facilities to ready mix concrete producers throughout the Midwest region, providing the producers with multiple supply options of gh quality fly ash.

With Charah's commitment to expanding the beneficial use of the CCPs generated at Kentucky plants coupled with LG&E and KU's commitment to ongoing environmental improvements, these products will serve as a reliable source of ASTM C618 Class F fly ash for regional ready mix concrete companies. As validated in an United States Environmental Protection Agency (EPA) report from February 2014, EPA found fly ash to be a viable construction material to replace cement in the production of concrete related products. The report stated, "Based on the conclusion of the analysis in this document stated above, and the available environmental and economic benefits, EPA supports the beneficial use of coal fly ash in concrete and FGD gypsum in wallboard." A copy of the full report can be accessed on EPA's website at: http://www.epa.gov/waste/conserve/imr/ccps/pdfs/ccr_bu_eval.pdf (http://www.epa.gov/waste/conserve/imr/ccps/pdfs/ccr_bu_eval.pdf).

ese combined contracts with LG&E and KU will provide for beneficial use of high quality fly ash resulting in a reduction of CO2 emissions achieved by the replacement of portand cement in concrete products. As part of these contracts, the expanded beneficial use also prevents the CCPs from being placed in landfills, thus preserving landfill space and the expenses associated with disposal.

According to Charles Price, Charah President and CEO, "As one of the largest companies involved in managing CCPs not just in Kentucky but throughout the United States, Charah is delighted to enter into this multi-plant effort with LG&E and KU. We believe that our innovative solutions will continue to pay dividends for our utility partners and their consumers, and we are proud to have been LG&E and KU's partner since 1998. Furthermore, we will be able to ensure a steady and reliable supply of ash for the ready mix concrete producers during a time of substantial change in the utility and fly ash industry."

About Charah, Inc.

Founded in 1987, Charah®, Inc. is a total solutions company providing unparalleled service and innovation. Based in Louisville, KY, Charah today is one of the largest providers of coal combustion product management and power plant support services for the coal-fired electric utility industry. Charah assists utilities with all aspects of managing and recycling ash byproducts generated from the combustion of coal in the production of electricity. Services include landfill construction, operations, management & closure; fly ash, bottom ash, Gypsum & FGD byproduct management; coal combustion product (CCP) sales & marketing; innovative products for the agricultural market; power plant support services including limestone supply, gypsum operations & wastewater treatment; ash pond conversion & closure; wet to dry fly ash conveyance and collection system conversion; ash pond management; Integrated Gasification Combine Cycle (IGCC) slag beneficiation and other innovative solutions. For more information, please visit www.charah.com (http://charah.com).

About LG&E and KU

Louisville Gas and Electric Company and Kentucky Utilities Company, part of the PPL Corporation (NYSE: PPL) family of companies, are regulated utilities that serve a total of 1.2 million customers and have consistently ranked among the best companies for customer service in the United States. LG&E serves 321,000 natural gas and 397,000 electric customers in Louisville and 16 surrounding counties. KU serves 543,000 customers in 77 Kentucky counties and five counties in Virginia. More information is available at www.lge-ku.com (http://www.lge-ku.com) and www.pplweb.com (http://www.pplweb.com).

Contact Us

12601 Plantside Drive

Louisville, KY 40299

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ENTITIES

John Walters <johnwalters@sterlingventures.com>

CCPs/Trimble County Landfill

1 message

John Walters <johnwalters@sterlingventures.com> Wed, Sep 24, 2014 at 12:18 PM
To: paul.puckett@lge-ku.com, Scott Straight <scott.straight@lge-ku.com>
Cc: Caryl Pfeiffer <caryl.pfeiffer@lge-ku.com>, "Voyles, John" <john.voyles@lge-ku.com>, "Sturgeon, Allyson" <allyson.sturgeon@lge-ku.com>, "chuck.schram@lge-ku.com" <chuck.schram@lge-ku.com>, Dorothy.O'brien@lge-ku.com, Samuelabboone <aboone@sterlingventures.com>

Paul and Scott:

Sterling Materials has been contacted by the USEPA concerning the availability of our underground mine as a potential disposal alternative to the construction of the proposed landfill at the Trimble County Generating Station. As a result of this inquiry, we have spoken with the Kentucky Division of Solid Waste concerning the modification of Sterling existing permit to receive gypsum from the Ghent facility to include all CCP's from Trimble. Preliminary indications from the Division of Solid Waste are that the modification should not be difficult given the benefits of placing the CCPs underground.

We believe that either trucking the CCPs, or constructing a barge facility on the river near our facility for moving the CCPs, could result in a significantly lower expense/PVRR than the proposed cost of constructing and operating the Trimble County landfill.

In addition, in our last bid to supply scrubber stone to both Ghent and Trimble County, we proposed the possibility of back-hauling CCPs from Trimble County to Ghent, and gypsum from Ghent to Sterling in order to free up space in the new Ghent landfill for the CCPs from Trimble County. Combining available space in the Ghent landfill with the available space in our mine could be another feasible alternative to the Trimble County landfill.

If you are interested in exploring the feasibility of transporting Trimble County's CCPs to Sterling Mine by either barge or truck, or using Ghent's landfill in combination with Sterling's mine, we would be more than happy to meet with you to discuss issues, comparative cost and benefits.

We look forward to hearing from you.

John

John W. Walters, Jr.
Sterling Ventures, LLC
376 South Broadway
Lexington, KY 40508
Phone (859) 259-9600
Fax (859) 259-9601

johnwalters@sterlingventures.com
CONFIDENTIALITY NOTICE: The electronic mail and the materials enclosed with this transmission are the private

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ENTURES

John Walters <johnwalters@sterlingventures.com>

rimble County CCR Disposal

1 message

Straight, Scott <Scott.Straight@lge-ku.com> Fri, Oct 3, 2014 at 12:37 PM
To: John Walters <johnwalters@sterlingventures.com>
Cc: "Puckett, Paul" <Paul.Puckett@lge-ku.com>

Mr. Walters:

LG&E is in receipt of your email of September 24, 2014 in which Sterling Ventures expressed interest in entering into a business arrangement to manage and dispose of coal combustion residuals ("CCR"), i.e., fly ash, bottom ash, pyrites, and gypsum, generated at the company's Trimble County Station. As a result of comments received from U.S. EPA in August 2014 on the alternatives analysis submitted by LG&E to the U. S. Army Corps to support a Clean Water Act permit application for CCR disposal in an adjacent ravine to Trimble County Station, LG&E is evaluating the feasibility of using the Sterling Ventures mine site for management and disposal of CCR generated at the Trimble Station over the anticipated life of the facility (i.e., a minimum of 37 years). Accordingly, your email and invitation to meet to discuss the logistics and costs of disposal of CCR at Sterling Ventures underground limestone mine are timely.

a preliminary step, LG&E needs to understand and confirm Sterling Venture's technical plans and mmitments that would create commercially viable long term CCR disposal capacity and ensure safe and environmentally compliant disposal of 33.4 million cubic yards of such material over the Trimble County Station's operating life. In previous negotiations in the 2010-2013 period to assess the feasibility for disposal of CCR from the Ghent Station at the Sterling Ventures mine site, Sterling's proposal was limited to gypsum and encompassed sale of limestone to Ghent with backhauling of gypsum. In this instance, we require specific information on disposal fees that would be charged for disposal of all CCR generated at the Trimble County Station without consideration of purchase of limestone. We also need other basic information that will allow us to assess the commercial and environmental viability of long term disposal of CCR at the Sterling Ventures mine site. Accordingly, we request the following information:

(1) Identify the disposal fee proposed by Sterling assuming delivery of CCR to the proposed mine shaft at the Sterling Ventures site (including any fee escalator over the 37 year life);

(2) Describe proposed methods for receiving delivery of CCR by barge or truck;

(3) Identify the disposal capacity available in the mine as of this date and specify if disposal capacity is only available in the uppermost seam/mining level;

(4) Identify the projected range in the mining rate over the 37 year term of any potential agreement with LG&E, explain the basis for the estimated rates, and provide the actual mining rate over the past three years for the seam where disposal will occur;

(5) Advise whether CCR material would be conveyed to a current or new mine shaft and provide the specific locations of such mine shaft(s) and specify whether the disposal fee includes Sterling Ventures paying for and installing all required shafts;

(6) Identify commitments proposed by Sterling to ensure that CCR from the Trimble County Station are not co-mingled with wastes or materials from other sources;

(7) Advise whether the mine is dry and identify measures taken to keep it dry; advise if water collects in the mine and identify measures taken to handle the water (including volumes of water pumped);

(8) Describe any groundwater monitoring wells for the site and provide general information for each well (e.g., location, depth, quality);

(9) Provide any environmental studies or evaluations regarding the mine including those already performed for the current permit and those for addressing and obtaining any additional necessary permitting approvals for disposal of CCR products listed above;

(10) Provide complete safety statistics for the Sterling Ventures facility for the most recent three years;

(11) Provide the most recent third-party audited financials for Sterling Ventures; and

(12) Describe the financial assurance Sterling Venture will provide to guarantee performance over the full expected life of the contract.

Please provide the above information no later than October 14, 2014. Feel free to contact Paul Puckett at (502) 627-4659 or at paul.puckett@lge-ku.com if you have any questions. Upon receipt of the above information, we will determine additional steps necessary for evaluation of this alternative.

Thank you in advance for your cooperation.

Scott Straight

Director Project Engineering

LG&E and KU Energy, LLC

502-627-2701

---------- The information contained in this transmission is intended only for the person or entity to which it is directly addressed or copied. It may contain material of confidential and/or private nature. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon, this information by persons or entities other than the intended recipient is not allowed. If you received this message and the information contained therein by error, please contact the sender and delete the material from your/any storage medium.

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John Walters <johnwalters@sterlingventures.com>

CCPs

1 message

John Walters <johnwalters@sterlingventures.com> Fri, Oct 24, 2014 at 4:13 PM
To: Scott Straight <scott.straight@lge-ku.com>, Samuelabboone <aboone@sterlingventures.com>, Tim Stout <tstout@sterlingventures.com>

Scott:

I am writing in response to your email of October 3rd with a variety of questions regarding the possibility of placing CCPs from Trimble County in Sterling Ventures' underground limestone mine outside of Verona, Kentucky. We will attempt to answer as many questions as possible given the limited amount of knowledge we have at this time regarding LG&E plans with respect to how, and in what state, the CCPs will be staged for pickup, and contractual terms LG&E would propose.

Our responses are attached and correspond to your numbered questions in your email. It may be appropriate for LG&E and Sterling to sit down and talk about some of the issues we have raised in e attached, as well as plan a meeting with the USACE and Ky. Division of Solid Waste to address y issues we are not considering with respect to utilizing Sterling's mine as an alternative to the proposed Trimble County Landfill.

We look forward to talking with you.

John

John W. Walters, Jr.
Sterling Ventures, LLC
376 South Broadway
Lexington, KY 40508
Phone (859) 259-9600
Fax (859) 259-9601

johnwalters@sterlingventures.com
CONFIDENTIALITY NOTICE: The electronic mail and the materials enclosed with this transmission are the private property of the sender and the materials are privileged communication intended solely for the receipt, use, benefit, and information of the intended recipient indicated above. If you are not the intended recipient, you are hereby notified that review, disclosure, copying, distribution, or the taking of action in reliance to the contents of this transmission is strictly prohibited, and may result in legal liability on your part. If you have received the transmission in error, please notify us mediately by phone (859) 259-9600 and arrange for the destruction or return of this transmission to us.

2 attachments

Form 7056.pdf
1339K

Responses to LG&E

1. *Identify the disposal fee proposed by Sterling assuming delivery of CCR to the proposed mine shaft at the Sterling Ventures site (including any fee escalator over the 37 year life).*

$10.15 per ton, based upon staging the product on site, then transporting into the mine by off-road haul trucks (see answer to question 2 below),with potential adjustments up or down based upon answers to the following:

a. Will the product be a blend of gypsum, fly ash and bottom ash, or will the products be delivered separately?

b. What will be the moisture content of the delivered product(s)?

c. Will any product(s) be delivered pneumatically?

d. What is the proposed delivery schedule?

    i. How many days per week?

    ii. How many hours per day?

    iii. How many tons per day (based on your requirement of 33.4 million cubic yards over 27 years are, are we correct in assuming approximately 900,000 cubic yards per year)?

    iv. What are the density assumptions for the delivered product(s) (ton/CY)?

As the cost factors associated with moving the CCPs to and around the proposed landfill are similar to Sterling's operational cost factors, Sterling would be agreeable to the O&M escalator LG&E is assuming when calculating the comparative PVRR for the alternatives analysis between utilizing Sterling's mine or the proposed Trimble landfill.

Our goal is that, based upon the comparative PVRR analysis of the mine verses landfill options, Sterling will be, at a minimum, a $10,000,000 PVRR lower cost alternative, without considering the considerable additional cost savings that would be generated from backhauling or barging our high calcium scrubber stone to either Ghent or Trimble County. We would work diligently with you to achieve that comparative PVRR savings.

Obviously, the comparative PVRR analysis will require consideration of transportation cost. As you did not ask about transportation cost, I assume you have, based upon the trucking logistics as outlined above, already have a bid for those costs in order to do the comparative PVRR analysis. If appropriate, Sterling would also like to be considered to provide trucking services.

2. *Describe proposed methods for receiving delivery of CCR by barge or truck.*

The method of receiving delivery by truck will depend in large part based upon answers to the above questions, plus a review of the TCLP analysis of the delivered products(s). For example, gypsum, if delivered separately, may require less onsite infrastructure than fly ash or bottom ash. The moisture content of the product will also affect the delivery method.

Depending on the above, the options are (i) dumping the product(s) at a staging area onsite prior to being hauled into the mine by articulated truck, (ii) dumping directly into a mine shaft specifically designed for the CCP placement, or (iii) pneumatically pumping through a pipe into the mine. Note that utilizing options (ii) and (iii) above would require capital expenditures by Sterling, but could reduce the cost per ton of placing the CCPs in the mine.

Delivery by barge will require the construction of a barge off-loading facility near Sterling's mine, which is located a little over a mile from the river. Depending upon the design of the barge facility, the CCP's could be (i) staged next to the barge facility then trucked into the mine, or (ii) conveyed directly into the mine. Barging the CCPs to Sterling's mine, especially when combined with back barging of limestone, we believe could generate enormous PVRR cost savings compared to the proposed landfill.

3. *Identify the disposal capacity available in the mine as of this date and specify if disposal capacity is only available in the uppermost seam/mining level.*

Sterling could utilize the all levels of the mine for the CCP placement. Sterling estimates that as of this date, there is enough existing space in the mine for at least 5,000,000 cubic yards of CCPs.

4. *Identify the projected range in the mining rate over the 37 year term of any potential agreement with LG&E, explain the basis for the estimated rates, and provide the actual mining rate over the past three years for the seam where disposal will occur;*

Sterling current mines between 900,000 and 1,500,000 tons of aggregate per year, depending on market conditions. In the event, LG&E purchased Sterling's high calcium limestone, the number would increase accordingly. Production tonnage for the last three years are as follows:

2011	1,451,671
2012	933,694
2013	1,181,745

5. Advise whether CCR material would be conveyed to a current or new mine shaft and provide the specific locations of such mine shaft(s) and specify whether the disposal fee includes Sterling Ventures paying for and installing all required shafts.

Using a mine shaft as access to the mine could decrease the above price by as much as $1 per ton. If a mine shaft is utilized, an older existing air shaft located immediately across from Sterling's mine office would be modified and utilized. Whether the cost of such a shaft is included in the price depends upon the guaranteed time commitment of LG&E. Your email indicates that you want a guaranteed obligation to make the mine available for 37 years. If your contractual time obligation is reciprocal, all capital cost would be included in the quoted price.

6. *Identify commitments proposed by Sterling to ensure that CCR from the Trimble County Station are not co-mingled with wastes or materials from other sources.*

Sterling will commit that the Trimble County CCPs would be segregated from other wastes.

7. Advise whether the mine is dry and identify measures taken to keep it dry; advise if water collects in the mine and identify measures taken to handle the water (including volumes of water pumped).

The mine is essentially dry in that water does not migrate into the mine through the limestone. Water is required in mining operations for dust control. Water from the surface flowing down the access slope is collected and used for dust control. In addition, water from surface ponds is periodically pumped into the mine as to supplement water collected at the bottom of the access slope.

8. Describe any groundwater monitoring wells for the site and provide general information for each well (e.g., location, depth, quality).

Attached is the Form 7059F filed in connection with obtaining the current Permit to receive gypsum from Ghent. The document describes the location of the mine levels to groundwater. The CCPs would be placed at a minimum of 200 feet below the deepest recorded well in the area, and below two bentonite seams. Surface groundwater monitoring wells would serve no function in this situation.

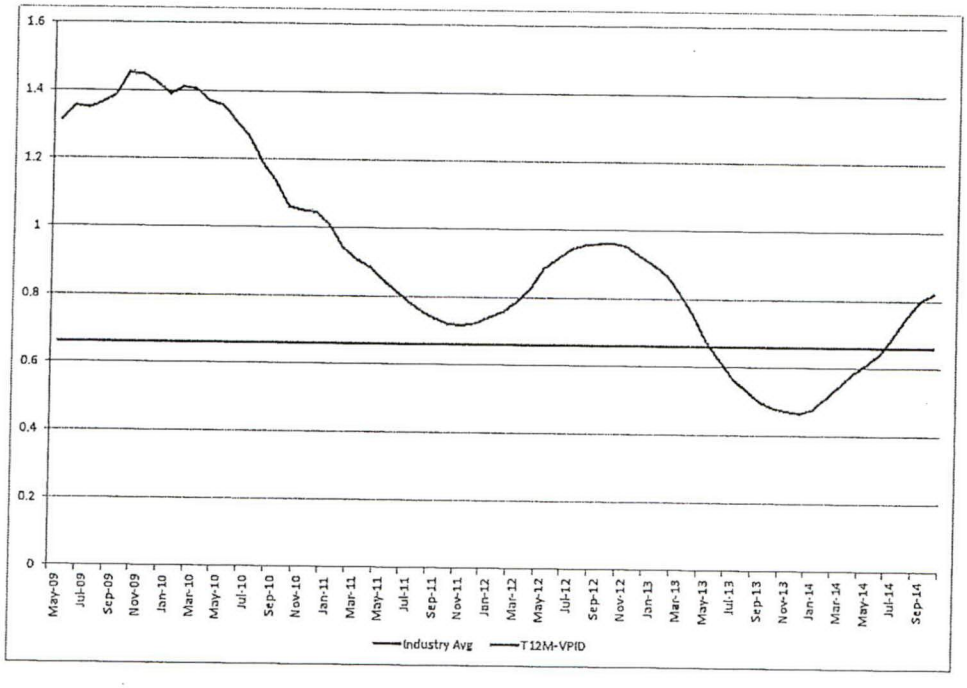
9. *Provide any environmental studies or evaluations regarding the mine including those already performed for the current permit and those for addressing and obtaining any additional necessary permitting approvals for disposal of CCR products listed above.*

See attached form 7059. Amending the current Permit to allow the CCPs to be placed in the mine will require submitting at a minimum TCLP analysis of the product and summary of the disposal method the parties agree to. Informal discussions with Ky. Division of Solid waste indicate that amending the Permit to allow for Trimble County's CCPs should not be a difficult process given the mine geology and current permit. We believe also worth considering as an

alternative in the comparative PVRR analysis is transporting Trimble Count's bottom ash and fly ash to the new Ghent landfill, and its gypsum to Sterling, in order to fully take advantage of Sterling's existing Permit without modification.

10. *Provide complete safety statistics for the Sterling Ventures facility for the most recent three years.*

The most accurate safety statistic is Sterling's violation per inspection day (VPID) as calculated by the Mine Safety and Health Administration (MSHA) as compared to the industry average for underground metal/non-metal mines. The following is a chart detailing Sterling's trailing 12 month VPID as compared to industry average for the past three years. As of September 2014, Sterling's 12 month trailing VPID is .8 violations per eight hour inspection day.



11. *Provide the most recent third-party audited financials for Sterling Ventures.*

Sterling is not willing to provide confidential business information in connection with quoting pricing for services.

12. *Describe the financial assurance Sterling Venture will provide to guarantee performance over the full expected life of the contract.*

Sterling is agreeable to providing reasonable financial assurances based upon a fair and equal allocation of risk between the parties, and reciprocal performance assurances by LG&E for utilization of the mine as contemplated above.

DEP 7059F (1/06)

RECEIVED
APR 19 2010
DIVISION OF WASTE MANAGEMENT
SOLID WASTE BRANCH

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
14 REILLY ROAD
FRANKFORT, KY 40601
TELEPHONE NUMBER (502) 564-6716

REGISTERED PERMIT-BY-RULE
For BENEFICIAL REUSE OF SPECIAL WASTE
DEP 7059F (1/06)

GENERAL INSTRUCTIONS

1. APPLICABILITY - This registration form must be completed and submitted to the Cabinet by persons who propose to beneficially re-use special waste.

2. ASSISTANCE – Questions regarding this form may be directed in writing to the Division of Waste Management, Solid Waste Branch at the address listed above, or by calling (502) 564-6716.

3. SUBMISSION – Please type or print legibly in permanent ink. Submit the original and one (1) copy of the completed registration form to the Division of Waste Management at the address noted above. If an item is not applicable to your facility write "N/A" in the space provided.

4. LAWS AND REGULATIONS – Registrants are expected to understand and comply with all laws and regulations applicable to beneficial reuse of special waste.

REGISTERED PERMIT-BY-RULE
BENEFICIAL REUSE OF SPECIAL WASTE

1. X New Registration - A registration number will be assigned by the Cabinet.
2. __ This is a proposed modification of an existing registration.

Note: (If you checked item 2, complete one or both of the following two items.)
3. Agency Interest #: _____ 4. Registration #: ___-_____

Registrant Information

(The corporation, LLC, business, person, government agency, etc., that owns or operates the facility.)

5. Registrant Name: Sterling Ventures, LLC d/b/a Sterling Materials

6. Registrant Mailing Address: 376 South Broadway

7. City: Lexington 8. State: KY 9. Zip Code: 40508

10. Contact Person: Samuel A.B. Boone 11. Title: President

12. Phone #: (859) 259-9600 13. Cell #: (859) 621-4121

14. Fax #: (859) 259-9601 15. E-Mail Address: aboone@sterlingventures.com

Special Waste Facility Information

16. Facility Name: Sterling Mine 17. County: Gallatin

18. Facility Location: 100 Sierra Drive
(For street or physical location only. Do not use P. O. Box #'s, etc.)
19. E-Mail Address: _____

20. City: Verona 21. Zip Code: 41092

22. Facility Contact Person: Sam Van 23. Title: Mine Superintendent

24. Phone #: (859) 567-7300 Fax #: (859) 567-7313 Cell #: (859) 621-2142

Preparer Information

(Complete items 27 – 36 if the following information concerning the person preparing this registration is different from the contact persons named above.)

27. Preparers Name: John Walters 28. Company: Sterling Ventures, LLC

29. Mailing Address: 376 S. Broadway 30. E-mail Address: johnwalters@sterlingventures.com

31. City: Lexington 32. State: KY 33. Zip Code: 40508

34. Phone #: (859) 259-9600 35. Fax #: (859) 259-9601 36. Cell #: (859) 621-3990

37. List the source (special waste generating facility) of the special waste to be beneficially reused. If there are multiple sources and more space is needed, use additional sheets and label as **Attachment 1.**

Special waste generator: KU Ghent Generation Station, Ghent, Carroll County, Kentucky

Special waste generator: _____

Special waste generator: _____

Special waste generator: _____

38. Provide, as **Attachment 2**, a description of the type and anticipated volume of special waste to be beneficially reused.

39. Provide as **Attachment 3**, a copy of the Toxicity Characteristic Leaching Procedure (TCLP) laboratory analysis for each type of special waste to be beneficially reused.

Note: You may omit the TCLP analysis or specific parameters of the analysis based upon your knowledge of the Special Waste, pursuant to 40 CFR 262.11. Should you elect to do this, a certified statement accepting responsibility will be required. Polychlorinated Biphenyls (PCBs) may also be omitted from the parameters listed in 401 KAR 45:100 Section 6(20)(b). Any certified statement for the omission of the TCLP or PCB data should be labeled as **Attachment 4.**

40. Provide, as **Attachment 5**, a description of how the special waste will be managed.

41. Provide, as **Attachment 6**, a description of how management and reuse of the special waste meets the environmental performance standards of 401 KAR 30:031.

42. **Attachment 7** is to be used to maintain a record of the special waste sources and amounts received. This form shall be utilized for quarterly reports submitted to the Cabinet.

43. Certification pursuant to 401 KAR 45:030 Section 10(4):

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for such violations."

Signature of Registrant _____ Date _____

Name of Registrant (Typed or Printed) _____

Title _____

Subscribed and sworn to before me by _____

this the _____ day of _____, 20 _____.

Notary Public Signature _____

My Commission Expires _____

Attachment 2
Type and Volume of Special Waste

Sterling Ventures is proposing to use up to 800,000 tons per year of FGD Gypsum produced from the KU Ghent Power Station in Ghent Kentucky to fill mine voids in mined out sections of Sterling's underground limestone mine located at 100 Sierra Drive, Verona, Gallatin County, Kentucky. Gypsum is calcium sulfate dihydrate, or $CaSO_4 \cdot 2H_2O$, which comes primarily from two sources: (i) Mined gypsum, a common mineral found around the world in sedimentary rock formations, from which it is mined or quarried, and (ii) FGD gypsum, which is produced as a byproduct from coal-fired electric utilities and is a synthetic material essentially identical in chemical structure to mined gypsum. The underground mine has the capacity to use 1,000,000 tons per year of gypsum for as long as the mine is operating at current limestone sales volumes.

FGD Gypsum

Scrubbers are attached to coal-fired power plants to limit emissions of the sulfur which is released when coal is burned. The scrubbers spray liquid lime or limestone slurry into the flue gas path, where it reacts with sulfur in the gas to form calcium sulfite, an intermediate product with little practical value. Calcium sulfite is commonly known as "scrubber sludge."

However, newer FGD scrubbing technologies can add an extra step to the scrubbing process known as "forced oxidation" which oxidizes the calcium sulfite and produces calcium sulfate dihydrate ($CaSO_4 \cdot 2H_2O$), or FGD gypsum. The FGD gypsum is easily dewatered and can be marketable in the wallboard and agricultural industries.

The Ghent power plant has installed forced oxidation scrubbers on all four of its generating units with a projected FGD gypsum production of approximately 800,000 tons per year. The Ghent plant has a contract to provide the FGD Gypsum to the CertainTeed, Inc. wallboard plant located in East Carrolton, Kentucky. KU has projected CertainTeed's usage to be approximately 222,000 ton per year. Excess FGD Gypsum at Ghent is placed on the plant's Gypsum Stacking Pond. The Stacking Pond is currently listed as one of the 49 High Hazard impoundment facilities in the United States listed by the EPA in its *Coal Combustion Residues (CCR) - Surface Impoundments with High Hazard Potential Ratings* report. (See EPA530-F-09-006 June 2009 (updated August 2009)).

Because CertainTeed cannot utilize all of Ghent's FGD Gypsum, the opportunity to beneficially reuse this excess of FGD gypsum for filling Sterling's underground mine voids is an attractive alternative. In addition to providing a benefit to Sterling in filling underground voids to promote improved airflow in the mine, placing the Ghent's excess gypsum at Sterling is important to substantially reducing or eliminating the volume of excess gypsum in the gypsum stacking pond.

Attachment 3
Toxicity Characteristic Leaching Procedure Laboratory Analysis

See attached Exhibit 3-A

EXHIBIT 3A

Microbac Laboratories, Inc.
KENTUCKY TESTING LABORATORY DIVISION
3323 Gilmore Industrial Blvd. Louisville, KY 40213 502.962.6400 Fax: 502.962.6411
Evansville, IN 812.464.9000 | Lexington, KY 859.276.3506 | Paducah, KY 270.898.7537

Member ACIL

Chemical, Biological, Physical, Molecular, and Toxicological Services

ELECTRONIC CERTIFICATE OF ANALYSIS

1006-00672

F.G & E (E ON US)
PAUL PUCKETT
EON-US / ANNUAL CCP EVALUATION

Date Reported 05/19/2010
Date Received 05/11/2010
Dates Sampled 05/04/2010-05/06/2010

Analysis	Out of Spec	Qualif	Result	Units	Min	Max	Method	Qua Limit	PQL or Std Limit	Date	Time	Tech
Sample: 014 GHENT - UNIT 1 FLY ASH							Date & Time Sampled:			05/06/2010	@ 11:00	
...continued												
Sample: 015 GHENT - UNIT 2 FLY ASH							Date & Time Sampled:			05/05/2010	@ 12:00	
DATE EXTRACTED TCLP			COMPLETED	---			SW846 1311			05/13/10	18:00	RFV
[TCLP Metals]							SW846 6010C					
ARSENIC, TCLP			<0.20	MG/L		5.0	SW846 6010C		0.2	05/18/10	2:11	EHL
BARIUM, TCLP			0.48	MG/L		100.0	SW846 6010C		0.002	05/18/10	2:11	EHL
CADMIUM, TCLP			<0.10	MG/L		1.0	SW846 6010C		0.004	05/19/10	13:39	EHL
CHROMIUM, TCLP			<0.10	MG/L		5.0	SW846 6010C		0.01	05/19/10	13:39	EHL
LEAD, TCLP			<0.10	MG/L		5.0	SW846 6010C		0.02	05/19/10	13:39	EHL
MERCURY, TCLP			<0.10	MG/L		0.2	SW846 6010C		0.004	05/19/10	13:39	EHL
SELENIUM, TCLP			<0.20	MG/L		1.0	SW846 6010C		0.1	05/18/10	2:11	EHL
SILVER, TCLP			<0.10	MG/L		5.0	SW846 6010C		0.01	05/19/10	13:39	EHL
Sample: 016 GHENT - GYPSUM STACK							Date & Time Sampled:			05/06/2010	@ 12:00	
DATE EXTRACTED TCLP			COMPLETED	---			SW846 1311			05/13/10	18:00	RFV
[TCLP Metals]							SW846 6010C					
ARSENIC, TCLP			<0.20	MG/L		5.0	SW846 6010C		0.2	05/18/10	2:16	EHL
BARIUM, TCLP			<0.10	MG/L		100.0	SW846 6010C		0.002	05/18/10	2:16	EHL
CADMIUM, TCLP			<0.10	MG/L		1.0	SW846 6010C		0.004	05/19/10	13:43	EHL
CHROMIUM, TCLP			<0.10	MG/L		5.0	SW846 6010C		0.01	05/19/10	13:43	EHL
LEAD, TCLP			<0.10	MG/L		5.0	SW846 6010C		0.02	05/19/10	13:43	EHL
MERCURY, TCLP			<0.10	MG/L		0.2	SW846 6010C		0.004	05/19/10	13:43	EHL
SELENIUM, TCLP			<0.20	MG/L		1.0	SW846 6010C		0.1	05/18/10	2:16	EHL
SILVER, TCLP			<0.10	MG/L		5.0	SW846 6010C		0.01	05/19/10	13:43	EHL
Sample: 017 GHENT - GYPSUM							Date & Time Sampled:			05/05/2010	@ 12:00	
DATE EXTRACTED TCLP			COMPLETED	---			SW846 1311			05/13/10	18:00	RFV
[TCLP Metals]							SW846 6010C					
ARSENIC, TCLP			<0.20	MG/L		5.0	SW846 6010C		0.2	05/18/10	2:19	EHL
BARIUM, TCLP			<0.10	MG/L		100.0	SW846 6010C		0.002	05/18/10	2:19	EHL
CADMIUM, TCLP			<0.10	MG/L		1.0	SW846 6010C		0.004	05/19/10	13:46	EHL
CHROMIUM, TCLP			<0.10	MG/L		5.0	SW846 6010C		0.01	05/19/10	13:46	EHL
LEAD, TCLP			<0.10	MG/L		5.0	SW846 6010C		0.02	05/19/10	13:46	EHL
MERCURY, TCLP			<0.10	MG/L		0.2	SW846 6010C		0.004	05/19/10	13:46	EHL

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Member ACIL

Chemical, Biological, Physical, Molecular, and Toxicological Services

ELECTRONIC CERTIFICATE OF ANALYSIS

LG & E (E ON US)
PAUL PUCKETT
EON-US / ANNUAL CCP EVALUATION

1005-00872

Date Reported 05/19/2010
Date Received 05/11/2010
Dates Sampled 05/04/2010-05/06/2010

Analysis	Out of Spec	Qualif	Result	Unit	Min	Max	Method	Cus Limit	PQL or Std Val	Date	Time	Tech
Sample: 017 GHENT - GYPSUM								Date & Time Sampled:		05/06/2010	@ 12:00	
.....continued												
SELENIUM, TCLP			<0.10	MG/L		1.0	SW846 6010C		0.1	05/18/10	2120	EHL
SILVER, TCLP			<0.10	MG/L		5.0	SW846 6010C		0.01	05/19/10	13:45	EHL

THIS REPORT HAS BEEN REVIEWED AND APPROVED FOR RELEASE: A. R. Clifton

LABORATORY DIRECTOR, KENTUCKY DIVISION

As regulatory limits change frequently, Microbac advises the recipient of this report to confirm such limits with the appropriate Federal, state, or local authorities before acting in reliance on the regulatory limits provided.
For any feedback concerning our services, please contact Andrew Clifton, the Laboratory Director at 502.962.6400. You may also contact both James Nokes, President and Robert Morgan, Chief Operating Officer at president@microbac.com.

Attachment 5
Management of Special Waste

Gypsum will be excavated from the Ghent's Gypsum Stacking Pond by excavator and loaded in tarped, tri-axel dump trucks for transportation to Sterling's mine. Sterling Venture's Verona mine produces limestone from underground operations only. It does not mine any limestone from open pits. Sterling mines from three underground levels, located in solid limestone bedrock. From a geological standpoint, the sea level elevation of the roof of the uppermost level is approximately 136 feet above sea level. The roofs of the second and third levels are approximately 28 feet above, and 149 feet below sea level, respectively. From a reference point, the lowest most level of the Ohio River adjacent to the Sterling Mine is approximately 401 feet above sea level. (see Exhibit 6C)

Once at the mine, the gypsum will be dumped directly from the dump trucks, via shaft, to the first level (the "Tyrone" seam) of the underground mine. Once underground, the gypsum will be carried by loader or conveyor to the mined out areas then stacked, pushed and compacted to fill the mine voids.

Attachment 6

Management and Reuse in compliance with 401 KAR 30:031

The following is a summary of the how the management and reuse meets each of the Sections of 401 KAR 30:031.

Section 2. Floodplains.
All gypsum will be placed in Sterling's underground mine. Gypsum will not be placed or stored above ground and therefore will have no impact on, or restrict the flow of, the 100 year floodplain.

Section 3. Endangered Species.
All gypsum will be placed in Sterling's underground mine. Gypsum will not be placed or stored above ground and therefore will have no impact on, or result in the destruction of the habitat of any threatened or endangered species.

Section 4. Surface Waters.
All gypsum will be placed in Sterling's underground mine. Gypsum will not be placed or stored above ground and therefore will have no impact on, or cause a discharge into, any waters of the Commonwealth.

Section 5. Groundwater.
All gypsum will be placed in solid bedrock in an area below the bottom level of the uppermost aquifer. Gypsum will not be placed or stored above ground and therefore will have no impact on, or cause a discharge into, any waters of the Commonwealth.

The uppermost mining level of Sterling's underground mine is located in what is known as the Tyrone seam of limestone. The Tyrone Limestone in north central Kentucky contains at least five potassium bentonites. Bentonite is a soft, low-specific-gravity, expandable clay. It is altered volcanic ash and because of its peculiar property of expanding when wet, bentonite is effective as a water sealer, especially to prevent pond leakage, and is also used in rotary drilling muds to prevent contaminating formations with drilling fluid. Drillers have labeled the two most prominent Tyrone bentonite beds the Mud Cave and Pencil Cave. The bentonite acts as an aquitard or confining layer that will prevent any contact of the gypsum with groundwater.

Attached as Exhibit 6-A is an excerpt from the U.S. Geological Survey - Hydrologic Atlas 730-K, Orville B. Lloyd, Jr., and William L. Lyke, 1995, describing the impact of the bentonite as a barrier to groundwater contact.

The roof of the uppermost mining level is over 200 feet below the bottom of any recorded well in the area. Regional wells do not extend below the bentonite levels in the Tyrone limestone. Attached as Exhibit 6-B is a listing of all recorded water wells in the area, their depth and distance between the bottom of the well and the roof of the Tyrone mining level.

Attached as Exhibit 6-C is a cross section of the Sterling's underground mine showing the Tyrone level mine in relation to the Mud Cave and Pencil Cave bentonite seams.

Section 6. Application to Land Use.
All gypsum will be placed underground. Gypsum will not be placed or stored above ground and therefore will have no impact on land use.

Section 7. Polychlorinated Biphenals.
FGD Gypsum does not contain PCBs.

Section 8. Disease.
All gypsum will be placed underground and therefore will be automatically covered. Gypsum is an inert naturally occurring mineral. Underground placement will eliminate any human health or environmental issues. No sewage sludge or septic tank materials are pumped or stored underground at Sterling's underground mine.

Section 9. Air.
Underground storage will not involve burning of gypsum, which is not a flammable material. Underground storage approximately 400 feet below the surface will prohibit the airborne release of gypsum.

Section 10. Safety.
Neither limestone mining nor gypsum produces any explosive gases or a fire hazard. Sterling's underground mine is gated, which prohibits any type of uncontrolled public access.

Section 11. Public Nuisance.
Underground storage will eliminate any public nuisance due to blowing litter, debris or other waste.

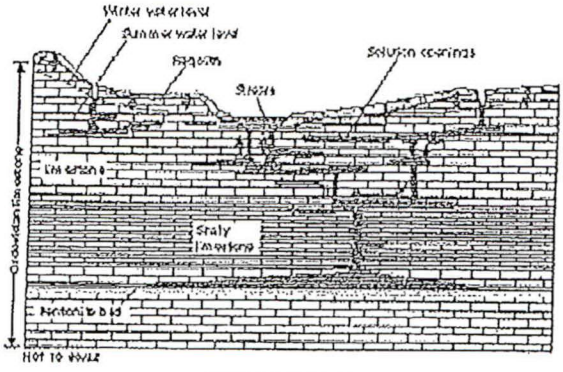
Section 12. Wetlands.
All gypsum will be placed underground. Gypsum will not be placed or stored above ground and therefore will have no impact on any wetlands

Section 13. Karst.
There are no sinkholes on or near the approximately 1,000 acres owned by Sterling. No surface water enters or exits the mine through any karst terrain or feature.

Section 14. Compliance.
Sterling will comply with all applicable requirements of KRS Chapter 224 and administrative regulation promulgated thereto.

Exhibit 6A

Confining units, such as beds of shaly limestone and bentonite, affect the depth to which freshwater circulates (fig. 97). Thin bentonite zones, which consist of clay particles that expand or swell when they become wet, form layers of low permeability that effectively impede the vertical movement of ground water. For example, in areas where the bentonite layers are continuous, the downward movement of ground water is restricted. This restriction isolates the ground water below the bentonite from the zone of dynamic circulation above the bentonite. U.S. Geological Survey - Hydrologic Atlas 730-K, Orville B. Lloyd, Jr., and William L. Lyke, 1995



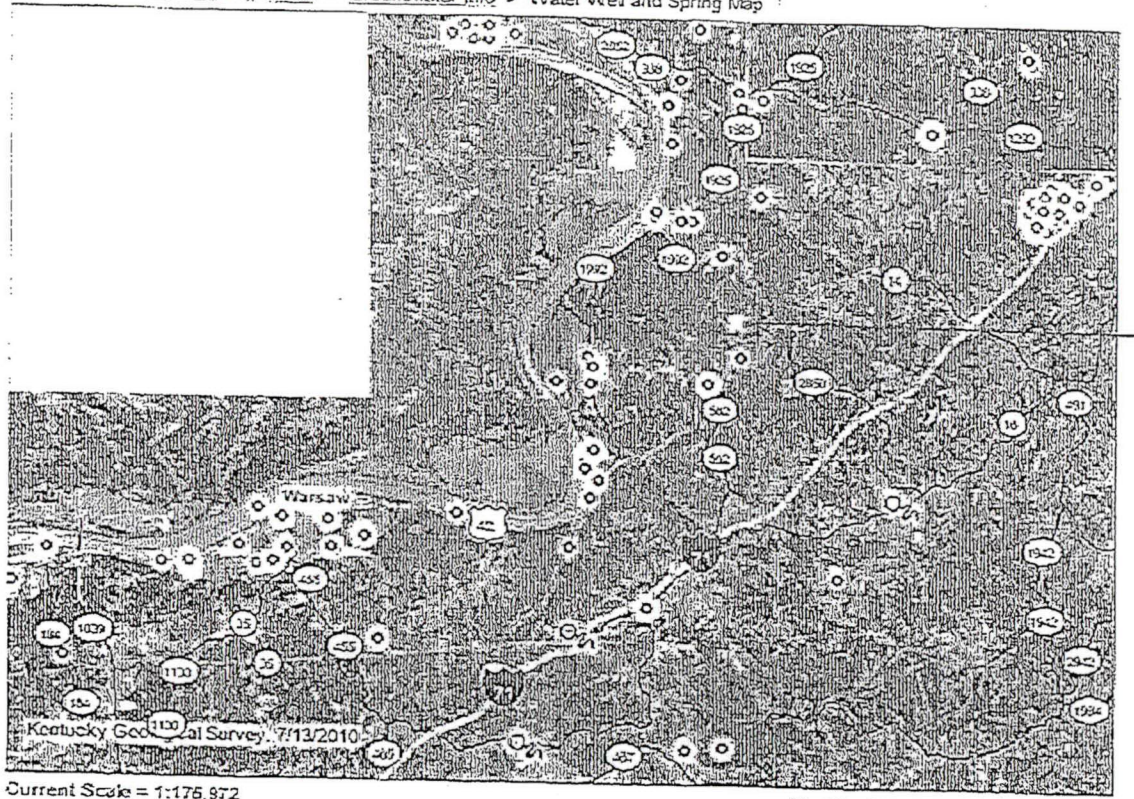
Modified from Zurawski, Ann, 1978, Summary appraisals of the Nation's ground-water resources—Tennessee region: U.S. Geological Survey Professional Paper 813-L, 35 p.

Figure 97. The limestone and dolomite aquifers contain small quantities of insoluble material and, therefore, produce only a thin layer of residuum when weathered. Recharge water percolates through the thin layer of surface material, called regolith, and subsequently moves through vertical fractures and horizontal bedding planes in the rocks. The slightly acidic water dissolves some of the limestone and dolomite as it moves to streams and other areas of discharge, such as springs and wells. The vertical movement of the recharge water and, therefore, the depth of development of solution openings, are restricted by zones of low permeability.

Kentucky Groundwater Data Repository
Kentucky Geological Survey
Water Well and Spring Location Map

Search Criteria:
no search criteria

Note: please disable popup blocking software for full functionality.
KGS Home > Maps, Pubs, & Data > Groundwater Info > Water Well and Spring Map



Current Scale = 1:176,972
Note: all wells and springs are displayed at scales below 1:100,000

Change Map Scale: choose a map scale

Change Basemap (background): color imagery (fsa)

Change Map Size: half pg (6.8 x 4.7 in) | full pg (6.8 x 9.4 in)
TIP: to print map to scale, be sure to "File --> Print Preview..." and print at 100% scaling.

Overview Map:

Map Tools:

zoom in	zoom out	zoom full
zoom last	pan	get coords

Move Map:

Other Tools:

zoom to a location

KY MAPS

Bookmark Map

EXHIBIT 6B

AKGWA NUMBER	lat27	lon27	Quadrangle	County	Construction Date	Primary Use	Surface Elevation	Total Depth	Bottom Elevation	Delta to Mine Roof	Owner	Owner Business	Regulatory Program
210	38.77528	-84.8131	Patriot	Gallatin	3/12/1987	DOMESTIC - SINGLE HOUSEHOLD	480	96	384	248	Wessells Constru		
950	38.81611	-84.8061	Patriot	Gallatin	6/22/1987	DOMESTIC - SINGLE HOUSEHOLD	510	99	411	275	Doolin		
2070	38.7525	-84.8722	Patriot	Gallatin	1/1/1900	DOMESTIC - SINGLE HOUSEHOLD	570				Hayton		
2070	38.7525	-84.8722	Patriot	Gallatin	1/1/1900	DOMESTIC - SINGLE HOUSEHOLD	570				Hayton		
2070	38.7525	-84.8722	Patriot	Gallatin	2/28/1986	DOMESTIC - SINGLE HOUSEHOLD	570	90	480	344	Hayton		
2070	38.7525	-84.8722	Patriot	Gallatin	2/28/1986	DOMESTIC - SINGLE HOUSEHOLD	570	90	480	344	Hayton		
2071	38.7975	-84.8078	Patriot	Gallatin	4/7/1986	DOMESTIC - SINGLE HOUSEHOLD	470	78	392	256	Wilker / McIntos		
2072	38.79167	-84.8039	Patriot	Gallatin	4/22/1986	DOMESTIC - SINGLE HOUSEHOLD	460	57	403	267	Perry		
3030	38.82306	-84.7594	Patriot	Gallatin	8/13/1985	DOMESTIC - SINGLE HOUSEHOLD	600	100	500	364	Whalen		
3885	38.82278	-84.8069	Patriot	Gallatin	7/30/1987	DOMESTIC - SINGLE HOUSEHOLD	524	142	382	246	Sproul		
6426	38.79722	-84.8072	Patriot	Gallatin	3/28/1988	DOMESTIC - SINGLE HOUSEHOLD	475	50	425.	289	Hudepohl		
6427	38.775	-84.9003	Florence	Gallatin	8/31/1988	INDUSTRIAL - GENERAL	485	92	393	257		Irving Materials Inc	
6429	38.7875	-84.8064	Patriot	Gallatin	5/16/1989	DOMESTIC - SINGLE HOUSEHOLD	475	65	410	274	Hell		
7861	38.87556	-84.7808	Rising Sun	Boone	10/8/1990	DOMESTIC - SINGLE HOUSEHOLD	495	70	425	289	Ralston		
8554	38.79639	-84.8078	Patriot	Gallatin	10/29/1987	DOMESTIC - SINGLE HOUSEHOLD	470	93	377	241	Schwab		
10409	38.75417	-84.9117	Florence	Gallatin	1/22/1993	DOMESTIC - SINGLE HOUSEHOLD	550	83	467	331	Fender		
14147	38.88472	-84.7817	Rising Sun	Boone	12/13/1988	DOMESTIC - SINGLE HOUSEHOLD	530	86	444	308	Wood		
14148	38.88472	-84.7817	Rising Sun	Boone	12/14/1988	DOMESTIC - SINGLE HOUSEHOLD	430	93	337	201	Wood		
20278	38.78389	-84.8475	Patriot	Gallatin	8/18/1986	DOMESTIC - SINGLE HOUSEHOLD	470	80	390	254	Boschert		
20583	38.88778	-84.7597	Rising Sun	Boone	1/1/1900		550				Waljih		
21565	38.76806	-84.7294	Verona	Grant	10/3/1986	DOMESTIC - SINGLE HOUSEHOLD	710	80	630	494	Ellis		
21577	38.88389	-84.7586	Rising Sun	Boone	6/5/1994	DOMESTIC - SINGLE HOUSEHOLD	520	80	440	304	Wilbur		
27010	38.8575	-84.7864	Patriot	Boone	6/8/1992	DOMESTIC - SINGLE HOUSEHOLD	477	56	421	285	Fred		
29603	38.77078	-84.9396	Florence	Gallatin	1/1/1900	PUBLIC - TRANSIENT, NON-COMMUNITY	460				Loewendick	Rivers Edge Campground	
34428	38.87778	-84.6744	Union	Boone	7/20/1993		810	63	747	611	Vaske		
34436	38.84806	-84.765	Patriot	Boone	1/20/1987	DOMESTIC - SINGLE HOUSEHOLD	495	64	431	295	Gilliand		
34438	38.90361	-84.7714	Rising Sun	Boone	12/10/1986	DOMESTIC - SINGLE HOUSEHOLD	600	100	500	364	Kurkel		
34474	38.89556	-84.6681	Union	Boone	4/23/1993		810	83	727	591	Allen		
34475	38.89694	-84.6694	Union	Boone	12/4/1992	DOMESTIC - SINGLE HOUSEHOLD	820	103	717	581	McDaniel		
37305	38.78611	-84.8903	Florence	Gallatin	10/1/1994	HEAT PUMP - OPEN LOOP	495	94	401	265		Gallatin County Schools	
37311	38.76583	-84.9856	Florence	Gallatin	1/19/1995	INDUSTRIAL - GENERAL	470	91	379	243		Steel Technologies Inc	
37376	38.78222	-84.9017	Florence	Gallatin	1/1/1930	PUBLIC - COMMUNITY	491	136	355	219		Warsaw Water Works	Drinking Water
37377	38.78262	-84.9017	Florence	Gallatin	1/1/1930	PUBLIC - COMMUNITY	491	96	395	259		Warsaw Water Works	Drinking Water
37378	38.77417	-84.8856	Florence	Gallatin	1/1/1967	AGRICULTURE - LIVESTOCK WATERING	505	78	427	291	Smith		
37400	38.77861	-84.8778	Florence	Gallatin	4/27/1995		500				Oldendick	Sugar Bay Golf Inc	
39222	38.77889	-84.8764	Florence	Gallatin	1/1/1965		503				Oldendick	Sugar Bay Golf Inc	
48660	38.77528	-84.8867	Florence	Gallatin	1/1/1900	DOMESTIC - SINGLE HOUSEHOLD	510				Beall		
49372	38.78583	-84.8931	Florence	Gallatin	11/1/1999	HEAT PUMP - OPEN LOOP	495					Gallatin County Schools	
49377	38.77063	-84.9102	Florence	Gallatin	2/28/2000	PUBLIC - COMMUNITY	500					Gallatin County Water District	Drinking Water
51920	38.89969	-84.7986	Rising Sun	Boone	1/1/1974	PUBLIC - TRANSIENT, NON-COMMUNITY	470	9	461	325		Camp Turn About	
55811	38.85639	-84.7742	Patriot	Boone	4/19/2002	DOMESTIC - SINGLE HOUSEHOLD	490	70	420	284		Big Bone Marina	
58332	38.85639	-84.7775	Patriot	Boone	5/1/2002	DOMESTIC - SINGLE HOUSEHOLD	460	63	397	261		Big Bone Marina	
58338	38.89111	-84.7776	Rising Sun	Boone	1/23/2002	DOMESTIC - SINGLE HOUSEHOLD	605	80	525	389	Parker		
65141	38.82028	-84.8053	Patriot	Gallatin	1/1/1900	INDUSTRIAL - GENERAL	523					Nugent Sand Co - Warsaw Plant	
40004237	38.72534	-84.7774	Glencoe	Grant		DOMESTIC - SINGLE HOUSEHOLD							
40004241	38.78173	-84.8874	Florence	Gallatin		UNKNOWN	475						
40004243	38.79923	-84.8049	Patriot IN	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		140					
40004245	38.81673	-84.8169	Patriot IN	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		101					
40005375	38.77145	-84.9049	Florence	Gallatin		UNKNOWN	515						
40005376	38.77423	-84.9747	Florence	Gallatin		UNKNOWN	455						
40005378	38.78257	-84.9019	Florence	Gallatin		PUBLIC	490	140	350	214			
40005886	38.72618	-84.7655	Glencoe	Grant		UNKNOWN							

AKGWA NUMBER	lat27	lon27	Quadrangle	County	Construction Date	Primary Use	Surface Elevation	Total Depth	Bottom Elevation	Delta to Mine Roof	Owner	Owner Business	Regulatory Program
40005892	38.76951	-84.9305	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		55					
40005893	38.76951	-84.9305	Florence	Gallatin		UNKNOWN	460						
40005894	38.77395	-84.9747	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		58					
40005895	38.85867	-84.7858	Patriot IN	Boone		DOMESTIC - SINGLE HOUSEHOLD	490	29	461	325			
40006041	38.78173	-84.8874	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		40					
40006325	38.77812	-84.8761	Florence	Gallatin		UNKNOWN	510		510	374			
40006326	38.78173	-84.8874	Florence	Gallatin		UNKNOWN	475		475	339			
40006327	38.79479	-84.8077	Patriot IN	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		60					
40006328	38.79923	-84.8049	Patriot	Gallatin		UNKNOWN	490						
40006757	38.72534	-84.7774	Glencoe	Grant		UNKNOWN							
40006762	38.77145	-84.9049	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		146					
40006763	38.77423	-84.9747	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		87					
40006764	38.86256	-84.7527	Patriot IN	Boone		PUBLIC							
40007580	38.72618	-84.7655	Glencoe	Grant		DOMESTIC - SINGLE HOUSEHOLD							
40007585	38.74757	-84.9699	Sanders	Gallatin		DOMESTIC - SINGLE HOUSEHOLD							
40007586	38.77395	-84.9747	Florence	Gallatin		UNKNOWN	453						
40007588	38.77812	-84.8761	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		80					
80003234	38.8625	-84.6614	Verona	Boone	7/22/1993	ITORING WELL - WATER LEVEL MONITORING	800	18	782	646		Bavarian Trucking Co Inc	Solid Waste
80003235	38.86139	-84.6572	Verona	Boone	7/14/1993	ITORING WELL - WATER LEVEL MONITORING	800	20.7	779.3	643.3		Bavarian Trucking Co Inc	Solid Waste
80003236	38.86083	-84.6592	Verona	Boone	7/10/1993	ITORING WELL - WATER LEVEL MONITORING	780	17.5	762.5	626.5		Bavarian Trucking Co Inc	Solid Waste
80003239	38.85917	-84.6619	Verona	Boone	7/22/1993	MONITORING WELL - AMBIENT MONITORING	740	18.2	721.8	585.8		Bavarian Trucking Co Inc	Solid Waste
80003240	38.85944	-84.6628	Verona	Boone	7/10/1993	MONITORING WELL - AMBIENT MONITORING	720	27	693	557		Bavarian Trucking Co Inc	Solid Waste
80003241	38.85972	-84.6639	Verona	Boone	7/10/1993	MONITORING WELL - AMBIENT MONITORING	720	22.9	697.1	561.1		Bavarian Trucking Co Inc	Solid Waste
80003242	38.85917	-84.665	Verona	Boone	7/21/1993	MONITORING WELL - AMBIENT MONITORING	720	18.4	701.6	565.6		Bavarian Trucking Co Inc	Solid Waste
80003243	38.85972	-84.6667	Verona	Boone	7/21/1993	MONITORING WELL - AMBIENT MONITORING	700	18.1	681.9	545.9		Bavarian Trucking Co Inc	Solid Waste
80003244	38.85944	-84.6678	Verona	Boone	7/20/1993	MONITORING WELL - AMBIENT MONITORING	720	18.9	701.1	565.1		Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	12/30/2000	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9		Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	12/30/2000	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9		Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	7/14/1993	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9		Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	7/14/1993	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9		Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	12/30/2000	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9		Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	12/30/2000	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9		Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	7/14/1993	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9		Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	7/14/1993	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9		Bavarian Trucking Co Inc	Solid Waste
80003246	38.86	-84.6642	Verona	Boone	7/27/1993	MONITORING WELL - AMBIENT MONITORING	720	18.3	701.7	565.7		Bavarian Trucking Co Inc	Solid Waste
80011401	38.86139	-84.6542	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	847.49					Bavarian Trucking Co Inc	Solid Waste
80011402	38.86167	-84.6539	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	847.92					Bavarian Trucking Co Inc	Solid Waste
80011403	38.85778	-84.6592	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	833.59					Bavarian Trucking Co Inc	Solid Waste
80011404	38.85806	-84.6589	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	833.65					Bavarian Trucking Co Inc	Solid Waste
80011405	38.85583	-84.6619	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	834.72					Bavarian Trucking Co Inc	Solid Waste
80011406	38.855	-84.6639	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	816.7					Bavarian Trucking Co Inc	Solid Waste
80011407	38.85611	-84.6672	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	800.5					Bavarian Trucking Co Inc	Solid Waste
80011408	38.85861	-84.67	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	766.27					Bavarian Trucking Co Inc	Solid Waste
80011409	38.86	-84.6692	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	767.85					Bavarian Trucking Co Inc	Solid Waste
80011410	38.86222	-84.6689	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	641.24					Bavarian Trucking Co Inc	Solid Waste
80011411	38.86222	-84.6669	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	643.85					Bavarian Trucking Co Inc	Solid Waste
80011412	38.86222	-84.6681	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	604.9					Bavarian Trucking Co Inc	Solid Waste
80011413	38.8625	-84.6622	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	828.1					Bavarian Trucking Co Inc	Solid Waste
80011414	38.8625	-84.6622	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	828.01					Bavarian Trucking Co Inc	Solid Waste
80011415	38.86417	-84.6594	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	780.48					Bavarian Trucking Co Inc	Solid Waste
80011416	38.86417	-84.6589	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	780.26					Bavarian Trucking Co Inc	Solid Waste
80011417	38.86556	-84.6625	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	784.79					Bavarian Trucking Co Inc	Solid Waste

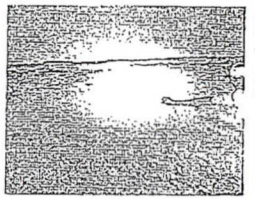
AKGWA NUMBER	lat27	lon27	Quadrangle	County	Construction Date	Primary Use	Surface Elevation	Total Depth	Bottom Elevation	Delta to Mine Roof	Owner	Owner Business	Regulatory Program
80011418	38.86361	-84.6542	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	762.46					Bavarian Trucking Co Inc	Solid Waste
80011419	38.86361	-84.6583	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	784.17					Bavarian Trucking Co Inc	Solid Waste
80012127	38.90417	-84.8358	Rising Sun	Boone	11/10/1980	MONITORING WELL - AMBIENT MONITORING	530	86	444	308		Cincinnati Gas & Electric	Solid Waste
80012127	38.90417	-84.8358	Rising Sun	Boone	11/10/1980	MONITORING WELL - AMBIENT MONITORING	530	86	444	308		Duke Energy Kentucky Inc	Solid Waste
80012133	38.90083	-84.8483	Rising Sun	Boone	11/26/1980	MONITORING WELL - AMBIENT MONITORING	475	57	418	282		Cincinnati Gas & Electric	Solid Waste
80012133	38.90083	-84.8483	Rising Sun	Boone	11/26/1980	MONITORING WELL - AMBIENT MONITORING	475	57	418	282		Duke Energy Kentucky Inc	Solid Waste
80012134	38.90083	-84.8411	Rising Sun	Boone	11/13/1980	MONITORING WELL - AMBIENT MONITORING	475	108	367	231		Cincinnati Gas & Electric	Solid Waste
80012134	38.90083	-84.8411	Rising Sun	Boone	11/13/1980	MONITORING WELL - AMBIENT MONITORING	475	108	367	231		Duke Energy Kentucky Inc	Solid Waste
80012135	38.90111	-84.8361	Rising Sun	Boone	3/28/1991	MONITORING WELL - AMBIENT MONITORING	475	33	442	306		Cincinnati Gas & Electric	Solid Waste
80012135	38.90111	-84.8361	Rising Sun	Boone	3/28/1991	MONITORING WELL - AMBIENT MONITORING	475	33	442	306		Duke Energy Kentucky Inc	Solid Waste
80012488	38.81611	-84.7694	Patriot	Gallatin	4/20/1994	MONITORING WELL - AMBIENT MONITORING	680	18	662	526		Old Starlite Tavern	UST
80012489	38.81611	-84.7694	Patriot	Gallatin	4/20/1994	MONITORING WELL - AMBIENT MONITORING	680	15	665	529		Old Starlite Tavern	UST
80012490	38.81611	-84.7694	Patriot	Gallatin	4/20/1994	MONITORING WELL - AMBIENT MONITORING	680	8.5	671.5	535.5		Old Starlite Tavern	UST
80026034	38.85972	-84.6603	Verona	Boone	5/8/1995	MONITORING WELL - AMBIENT MONITORING	759.34	16	743.34	607.34		Bavarian Trucking Co Inc	Solid Waste
80026035	38.86	-84.665	Verona	Boone	5/10/1995	MONITORING WELL - AMBIENT MONITORING	723.22	16.3	706.92	570.92		Bavarian Trucking Co Inc	Solid Waste
80026544	38.90278	-84.8417	Rising Sun	Boone	11/1/1993	MONITORING WELL - AMBIENT MONITORING	540	80	460	324		Cincinnati Gas & Electric	Solid Waste
80026544	38.90278	-84.8417	Rising Sun	Boone	11/1/1993	MONITORING WELL - AMBIENT MONITORING	540	80	460	324		Duke Energy Kentucky Inc	Solid Waste
80026545	38.90056	-84.8419	Rising Sun	Boone	10/13/1995	MONITORING WELL - AMBIENT MONITORING	475	41	434	298		Cincinnati Gas & Electric	Solid Waste
80026545	38.90056	-84.8419	Rising Sun	Boone	10/13/1995	MONITORING WELL - AMBIENT MONITORING	475	41	434	298		Duke Energy Kentucky Inc	Solid Waste
80026547	38.90417	-84.8444	Rising Sun	Boone	10/17/1995	MONITORING WELL - AMBIENT MONITORING	520	80.5	439.5	303.5		Cincinnati Gas & Electric	Solid Waste
80026547	38.90417	-84.8444	Rising Sun	Boone	10/17/1995	MONITORING WELL - AMBIENT MONITORING	520	80.5	439.5	303.5		Duke Energy Kentucky Inc	Solid Waste
80026549	38.90194	-84.8292	Rising Sun	Boone	10/18/1995	MONITORING WELL - AMBIENT MONITORING	470	30.5	439.5	303.5		Cincinnati Gas & Electric	Solid Waste
80026549	38.90194	-84.8292	Rising Sun	Boone	10/18/1995	MONITORING WELL - AMBIENT MONITORING	470	30.5	439.5	303.5		Duke Energy Kentucky Inc	Solid Waste
80029573	38.90121	-84.8476	Rising Sun	Boone	11/30/2005	MONITORING WELL - AMBIENT MONITORING		120				Cincinnati Gas & Electric	Solid Waste
80029573	38.90121	-84.8476	Rising Sun	Boone	11/30/2005	MONITORING WELL - AMBIENT MONITORING		120				Duke Energy Kentucky Inc	Solid Waste
80029577	38.902	-84.8484	Rising Sun	Boone	12/2/2005	MONITORING WELL - AMBIENT MONITORING		120				Cincinnati Gas & Electric	Solid Waste
80029577	38.902	-84.8484	Rising Sun	Boone	12/2/2005	MONITORING WELL - AMBIENT MONITORING		120				Duke Energy Kentucky Inc	Solid Waste
80029864	38.74278	-84.8358	Glencoe	Gallatin	5/29/1996	MONITORING WELL - AMBIENT MONITORING	680	7.5	672.5	536.5		Glencoe Carry-out	UST
80029865	38.74278	-84.8358	Glencoe	Gallatin	5/29/1996	MONITORING WELL - AMBIENT MONITORING	680	12	668	532		Glencoe Carry-out	UST
80029872	38.74278	-84.8358	Glencoe	Gallatin	6/7/1996	MONITORING WELL - AMBIENT MONITORING	680	15	665	529		Glencoe Carry-out	UST
80029873	38.74278	-84.8358	Glencoe	Gallatin	6/7/1996	MONITORING WELL - AMBIENT MONITORING	680	13	667	531		Glencoe Carry-out	UST
80029874	38.74278	-84.8358	Glencoe	Gallatin	6/7/1996	MONITORING WELL - AMBIENT MONITORING	680	23	657	521		Glencoe Carry-out	UST
80029875	38.74278	-84.8358	Glencoe	Gallatin	6/7/1996	MONITORING WELL - AMBIENT MONITORING	680	30	650	514		Glencoe Carry-out	UST
80030354	38.74278	-84.8358	Glencoe	Gallatin	6/19/1996	MONITORING WELL - AMBIENT MONITORING	680	30	650	514		Glencoe Carry-out	UST
80030355	38.74278	-84.8358	Glencoe	Gallatin	6/19/1996	MONITORING WELL - AMBIENT MONITORING	680	18	662	526		Glencoe Carry-out	UST
80030356	38.74278	-84.8358	Glencoe	Gallatin	6/20/1996	MONITORING WELL - AMBIENT MONITORING	680	43	637	501		Glencoe Carry-out	UST
80030955	38.74222	-84.8347	Glencoe	Gallatin	9/4/1996	MONITORING WELL - AMBIENT MONITORING	690	25	665	529		Glencoe Carry-out	UST
80030956	38.74222	-84.8347	Glencoe	Gallatin	9/4/1996	MONITORING WELL - AMBIENT MONITORING	690	25	665	529		Glencoe Carry-out	UST
80032432	38.86667	-84.6483	Verona	Boone	7/12/1999	MONITORING WELL - AMBIENT MONITORING	840	23.7	816.3	680.3		Bavarian Trucking Co Inc	Solid Waste
80032433	38.86667	-84.6483	Verona	Boone	7/12/1999	MONITORING WELL - AMBIENT MONITORING	831	30.5	800.5	664.5		Bavarian Trucking Co Inc	Solid Waste
80035870	38.74194	-84.8347	Glencoe	Gallatin	11/9/1998	MONITORING WELL - AMBIENT MONITORING	700	30.5	669.5	533.5		Glencoe Carry-out	UST
80035879	38.74222	-84.8347	Glencoe	Gallatin	11/9/1998	MONITORING WELL - AMBIENT MONITORING	690	6	684	548		Glencoe Carry-out	UST
80035880	38.74222	-84.8347	Glencoe	Gallatin	11/9/1998	MONITORING WELL - AMBIENT MONITORING	690	7	683	547		Glencoe Carry-out	UST
80037728	38.88611	-84.7522	Rising Sun	Boone	7/16/2004	MONITORING WELL - AMBIENT MONITORING	460					Kentucky State Parks	
80038750	38.74278	-84.8358	Glencoe	Gallatin	1/12/2000	MONITORING WELL - AMBIENT MONITORING	680	20.2	659.8	523.8		Glencoe Carry-out	UST
80039695	38.77111	-84.9311	Florence	Gallatin	5/24/2000	MONITORING WELL - AMBIENT MONITORING	460	15.5	444.5	308.5		Dans Marina	UST
80039696	38.77111	-84.9311	Florence	Gallatin	5/24/2000	MONITORING WELL - AMBIENT MONITORING	460	15.5	444.5	308.5		Dans Marina	UST
80039697	38.77111	-84.9311	Florence	Gallatin	5/24/2000	MONITORING WELL - AMBIENT MONITORING	460	15.5	444.5	308.5		Dans Marina	UST
80040053	38.77556	-84.9156	Florence	Gallatin	9/29/2000	MONITORING WELL - AMBIENT MONITORING	490	139	351	215		Warsaw Water Works	
80040054	38.78444	-84.9092	Florence	Gallatin	9/29/2000	MONITORING WELL - AMBIENT MONITORING	480	117	363	227		Warsaw Water Works	
80043988	38.74278	-84.8358	Glencoe	Carroll	10/29/2001	MONITORING WELL - AMBIENT MONITORING	680	25	655	519		Glencoe Carry-out	UST
80044011	38.87861	-84.6994	Union	Boone	12/4/2001	MONITORING WELL - AMBIENT MONITORING	740	6.5	733.5	597.5		Matracia & Matracia Partnershi	UST

AKGWA NUMBER	lat27	lon27	Quadrangle	County	Construction Date	Primary Use	Surface Elevation	Total Depth	Bottom Elevation	Delta to Mine Roof	Owner	Owner Business	Regulatory Program
80044012	38.87861	-84.6994	Union	Boone	12/4/2001	MONITORING WELL - AMBIENT MONITORING	740	10.2	729.8	593.8		Matracia & Matracia Partnershi	UST
80044013	38.87861	-84.6994	Union	Boone	12/4/2001	MONITORING WELL - AMBIENT MONITORING	740	9.3	730.7	594.7		Matracia & Matracia Partnershi	UST
80044014	38.87861	-84.6994	Union	Boone	12/4/2001	MONITORING WELL - AMBIENT MONITORING	740	9	731	595		Matracia & Matracia Partnershi	UST
80049181	38.76056	-84.7889	Patriot	Gallatin	5/4/2004	MONITORING WELL - AMBIENT MONITORING	850					Napoleon Grocery	UST
80049182	38.76056	-84.7889	Patriot	Gallatin	5/3/2004	MONITORING WELL - AMBIENT MONITORING	850					Napoleon Grocery	UST
80049185	38.76056	-84.7889	Patriot	Gallatin	5/3/2004	MONITORING WELL - AMBIENT MONITORING	850					Napoleon Grocery	UST
80049186	38.76056	-84.7889	Patriot	Gallatin	5/4/2004	MONITORING WELL - AMBIENT MONITORING	850					Napoleon Grocery	UST
80049425	38.87861	-84.6994	Union	Boone	1/5/2004	MONITORING WELL - AMBIENT MONITORING	740	6	734	598		Matracia & Matracia Partnershi	UST
80049426	38.87861	-84.6994	Union	Boone	1/5/2004	MONITORING WELL - AMBIENT MONITORING	740	8	732	596		Matracia & Matracia Partnershi	UST
80049427	38.87861	-84.6994	Union	Boone	1/5/2004	MONITORING WELL - AMBIENT MONITORING	740	8.5	731.5	595.5		Matracia & Matracia Partnershi	UST
80049428	38.87861	-84.6994	Union	Boone	1/5/2004	MONITORING WELL - AMBIENT MONITORING	740	6.5	733.5	597.5		Matracia & Matracia Partnershi	UST
80049429	38.87861	-84.6994	Union	Boone	1/5/2004	MONITORING WELL - AMBIENT MONITORING	740	4	736	600		Matracia & Matracia Partnershi	UST
80050961	38.85639	-84.6669	Verona	Boone	11/9/2005	MONITORING WELL - AMBIENT MONITORING	800					Bavarian Trucking Co Inc	Solid Waste
80053954	38.90083	-84.8369	Rising Sun	Boone	9/20/2007	MONITORING WELL - AMBIENT MONITORING		45				Duke Energy Kentucky Inc	Solid Waste
80053955	38.90389	-84.8369	Rising Sun	Boone	9/18/2007	MONITORING WELL - AMBIENT MONITORING		117.5				Duke Energy Kentucky Inc	Solid Waste

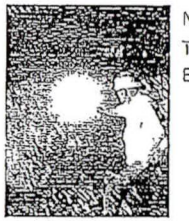
Exhibit 6C

Sterling Materials – Verona, KY
Underground Cross Section





Pencil Cave Bentonite Seam
Thickness: ≈ 18"
Elevation: +266'



Mud Cave Bentonite Seam
Thickness: ≈ 24"
Elevation: +247'

+500' (Top of Slope Elevation)

Surface Varies from 500' to 800'

Gypsum – Delivery Shaft

+393' (Mine Entrance Elevation)

+266' – Pencil Cave Bentonite Seam Elevation

+247' – Mud Cave Bentonite Seam Elevation

+136' (Avg Level 1 Ceiling Elevation)

1st Level

+86' (Avg Level 1 Floor Elevation)

+28' (Avg Level 2 Ceiling Elevation)

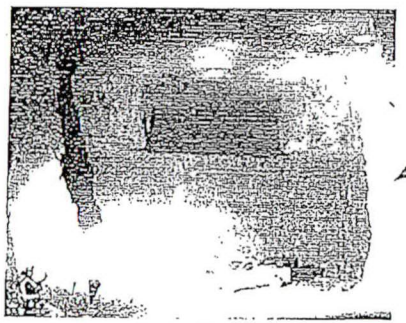
2nd Level

+2' (Avg Level 1 Floor Elevation)

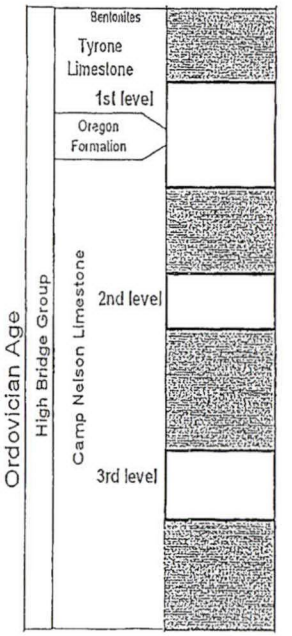
-149' (Avg Level 3 Ceiling Elevation)

3rd Level

-182' (Avg Level 1 Floor Elevation)



Interior Mine Photo: Typical Storage Area



Notes:

- Drawing Not to Scale.
- Mine ceiling and floor elevations are based on average elevations across each level.
- Bentonite Seam and Rock Stratigraphy Information Resource: Kentucky Geological Survey, University of Kentucky, Lexington Series X, 1974. High Carbonate Rock in the High Bridge Group (Middle Ordovician), Boone County, Kentucky. Author: Garland R. Dever, Jr.
- Elevations are referenced at Sea Level.

Attachment 7
Special Waste Sources and Amounts Log Sheet

1. Registrant Name: _____ 2. County: _____

3. Agency Interest #: _____ 4. Registration #: ____-_____

5. Contact Person: _____ 6. Title: _____

7. Phone #: (___)___-____ 8. Fax #: (___)___-____ 9. Cell #: (___)___-____

Report prepared for the months of: _____, _____ and _____ Year: ____

Name of Special Waste Generator (Source of Special Waste)	Amount Received (Dry Tons)

10. "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for such violations."

Authorized Signature _____ Date _____

Name: (Typed or Printed) _____ Title: _____

STERLING ENTURES

John Walters <johnwalters@sterlingventures.com>

Sterling Ventures CCR Storage

1 message

Straight, Scott <Scott.Straight@lge-ku.com> Fri, Oct 31, 2014 at 2:29 PM
To: John Walters <johnwalters@sterlingventures.com>

John,

We appreciate your responses of October 24th to our questions regarding the potential disposal of CCR from LG&E's Trimble County Station at Sterling Venture's limestone mine in Gallatin County. At this time, we believe we have all the information needed from Sterling Ventures to allow us to continue our evaluation of the project.

Thanks again.

Scott Straight

Director Project Engineering

LG&E and KU Energy, LLC

502-627-2701

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STERLING VENTURES

John Walters <johnwalters@sterlingventures.com>

Re: Sterling Ventures CCR Storage

1 message

John Walters <johnwalters@sterlingventures.com> Mon, Dec 1, 2014 at 1:13 PM
To: "Straight, Scott" <Scott.Straight@lge-ku.com>

Scott

A barge load/unload site near our mine is potentially available if you are interested in discussing barge options for Trimble or Ghent CCPs.

John

John W. Walters, Jr.
Sterling Ventures, LLC
376 South Broadway
Lexington, KY 40508
Phone (859) 259-9600
Fax (859) 259-9601

johnwalters@sterlingventures.com
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On Fri, Oct 31, 2014 at 2:29 PM, Straight, Scott <Scott.Straight@lge-ku.com> wrote:

> John,
>
> We appreciate your responses of October 24th to our questions regarding the potential disposal of CCR from LG&E's Trimble County Station at Sterling Venture's limestone mine in Gallatin County. At this time, we believe we have all the information needed from Sterling Ventures to allow us to continue our evaluation of the project.
>
> Thanks again.
>
> *Scott Straight*
>
> Director Project Engineering
>
> LG&E and KU Energy, LLC

STERLING ENTURES

John Walters <johnwalters@sterlingventures.com>

Re: Sterling Ventures CCR Storage

1 message

Straight, Scott <Scott.Straight@lge-ku.com> Fri, Dec 5, 2014 at 2:58 PM
To: John Walters <johnwalters@sterlingventures.com>

John

I am out of town this week on business, so my apologies for not getting back sooner. Are you saying you know of a plot of land available to site a barge load-out facility or a site that already has equipment installed that could serve as a barge unloading facility of CCR?

Scott Straight
Director Project Engineering
LG&E and KU Energy

On Dec 1, 2014, at 12:13 PM, John Walters <johnwalters@sterlingventures.com> wrote:

> Scott
>
> A barge load/unload site near our mine is potentially available if you are interested in discussing barge options for Trimble or Ghent CCPs.
>
> John
>
> John W. Walters, Jr.
> Sterling Ventures, LLC
> 376 South Broadway
> Lexington, KY 40508
> Phone (859) 259-9600
> Fax (859) 259-9601
>
> johnwalters@sterlingventures.com
> CONFIDENTIALITY NOTICE: The electronic mail and the materials enclosed with this transmission are the private property of the sender and the materials are privileged communication intended solely for the receipt, use, benefit, and information of the intended recipient indicated above. If you are not the intended recipient, you are hereby notified that review, disclosure, copying, distribution, or the taking of action in reliance to the contents of this transmission is strictly prohibited, and may result in legal liability on your part. If you have received the transmission in error, please notify us immediately by phone (859) 259-9600 and arrange for the destruction or return of this transmission to us.
>
> On Fri, Oct 31, 2014 at 2:29 PM, Straight, Scott <Scott.Straight@lge-ku.com> wrote:
>
> > John,
> >
> > We appreciate your responses of October 24th to our questions regarding the potential disposal of CCR from LG&E's Trimble County Station at Sterling Venture's limestone mine in Gallatin County. At this time, we believe we have all the information needed from Sterling Ventures to allow us to continue our evaluation of the project.

STERLING ENTUMED

John Walters <johnwalters@sterlingventures.com>

Re: Sterling Ventures CCR Storage

1 message

John Walters <johnwalters@sterlingventures.com> Thu, Dec 11, 2014 at 2:07 PM
To: "Straight, Scott" <Scott.Straight@lge-ku.com>

Scott

Does LGE/KU want to sit down and discuss the specifics of a barge option? We have looked at the projected cost of barging CCPs to Sterling, compared to the landfill construction cost as out lined in your most recent PSC filling, and the PVRR cost saving appear to be significant.

John

John W. Walters, Jr.
Sterling Ventures, LLC
376 South Broadway
Lexington, KY 40508
Phone (859) 259-9600
Fax (859) 259-9601

johnwalters@sterlingventures.com
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On Fri, Dec 5, 2014 at 4:26 PM, John Walters <johnwalters@sterlingventures.com> wrote:

> Scott
>
> We have found a site that already has an approved permit, but does not have any of the in-river infrastructure (i.e dolphins, cells or piers). The permit would need to be modified for the contemplated new use, which, according to the Army Corp, would take about six months. The site already is rip-rapped and has a concrete ramp and siding. Anticipated transportation cost from barge facility to mine of approximately $2.50/ton.
>
> John
>
> John W. Walters, Jr.
> Sterling Ventures, LLC
> 376 South Broadway
> Lexington, KY 40508
> Phone (859) 259-9600
> Fax (859) 259-9601
>
> johnwalters@sterlingventures.com
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STERLING VENTURES

John Walters <johnwalters@sterlingventures.com>

Sterling Ventures alternative to Trimble County Landfill

1 message

John Walters <johnwalters@sterlingventures.com> Tue, Dec 30, 2014 at 12:25 PM
To: Scott Straight <scott.straight@lge-ku.com>

Scott

I have not heard anything in response to my December 11 e-mail asking if LG&E would like to sit down and talk about the options and logistical issues of barging CCRs to our facility as an alternative to the building the new Trimble County Landfill. Is this an alternative that LG&E wants to explore?

John

John W. Walters, Jr.
Sterling Ventures, LLC
376 South Broadway
Lexington, KY 40508
Phone (859) 259-9600
Fax (859) 259-9601

johnwalters@sterlingventures.com
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1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**					12/31/2014	12/31/2015	12/30/2016	12/31/2017	12/31/2018	12/31/2019	12/30/2020	12/31/2021	12/31/2022	12/31/2023	12/30/2024	12/31/2025	12/31/2026
3	Tons	1.17	**745,290**	745,290			Cubic Yards Per Year		600,000									
4	Cubic yards		**637,000**	637,000	Cumulative Cu Yd		Cumulative Cubic Yards -->			637,000	1,274,000	1,911,000	2,548,000	3,185,000	3,822,000	4,459,000	5,096,000	5,733,000
5	Gross Price per ton		$ **16.80**	Fee + transport barge to mine			Available CY in Mine		6,800,000	6,763,000	6,726,000	6,689,000	6,652,000	6,615,000	6,578,000	6,541,000	6,504,000	6,467,000
6	0.75% IMPA/IMEA		$ **12.60**	Net cost to KU/LGE														
7	Revenue Requirement																	
8	On-Load and Off-Load Barge Facilities								$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500
9	Additional Required Facilities					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant					$0	$0	$0	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500
11	Less Accumulated Depreciation						$0	$0	$0	($711,284)	($1,422,568)	($2,133,851)	($2,845,135)	($3,556,419)	($4,267,703)	($4,978,986)	($5,690,270)	($6,401,554)
12	Less Deferred Tax Balance							$0	$0	($107,217)	($569,573)	($976,442)	($1,332,124)	($1,640,303)	($1,904,666)	($2,128,386)	($2,314,637)	($2,494,745)
13	Environmental Compliance Rate Base					$0	$0	$0	$26,317,500	$25,498,999	$24,325,359	$23,207,206	$22,140,241	$21,120,778	$20,145,131	$19,210,127	$18,312,593	$17,421,201
14	Return on Environmental Rate Base					10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)			PVRR	$19,295,322	$0	$0	$0	$2,631,750	$2,549,900	$2,432,536	$2,320,721	$2,214,024	$2,112,078	$2,014,513	$1,921,013	$1,831,259	$1,742,120
16																		
17	Barge Shipping Costs		$ 1.96	745,290						$1,460,768	$1,497,288	$1,534,720	$1,573,088	$1,612,415	$1,652,725	$1,694,043	$1,736,395	$1,779,804
18	Barge Facilities' Operating Costs				Inflation Assumption				$0	$0	$825,000	$845,625	$866,766	$888,435	$910,646	$933,412	$956,747	$980,666	$1,005,182
19	CCR to Storage Facility @		$ 12.60	per ton	2.50%						$9,390,654	$9,625,420	$9,866,056	$10,112,707	$10,365,525	$10,624,663	$10,890,280	$11,162,537	$11,441,600
20	Warsaw Land Lease										$200,000	$205,000	$210,125	$215,378	$220,763	$226,282	$231,939	$237,737	$243,681
21	Operating Expenses					$0	$0	$0	$0	$11,876,422	$12,173,333	$12,477,666	$12,789,608	$13,109,348	$13,437,082	$13,773,009	$14,117,334	$14,470,267
22	Annual Depreciation						$0	$0	$0	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284
23	Annual Property Tax Expense						$0	$0	$0	$39,476	$38,409	$37,342	$36,275	$35,209	$34,142	$33,075	$32,008	$30,941
24	Total Operating E(m)			PVRR	$188,218,444	$0	$0	$0	$0	$12,627,182	$12,923,026	$13,226,292	$13,537,167	$13,855,840	$14,182,507	$14,517,367	$14,860,626	$15,212,492
25	Total E(m) CCR to Sterling			**PVRR**	**$207,513,765**	$0	$0	$0	$2,631,750	$15,177,082	$15,355,562	$15,547,013	$15,751,191	$15,967,918	$16,197,020	$16,438,380	$16,691,885	$16,954,612
26	**All-in Annual Cost per Cubic Yd**									**$23.83**	**$24.11**	**$24.41**	**$24.73**	**$25.07**	**$25.43**	**$25.81**	**$26.20**	**$26.62**
27	Total E(m) CCR to Trimble (See Row 49 below)			**PVRR**	**$464,429,366**	$0	$2,530,000	$14,947,950	$23,647,650	$48,033,216	$46,609,152	$45,153,465	$43,759,068	$42,421,921	$41,137,981	$39,903,786	$41,585,876	$43,072,231
28	**PVRR Comparative (savings) cost**			**6.70%**	**($256,915,601)**	$0	($2,530,000)	($14,947,950)	($21,015,900)	($32,856,134)	($31,253,590)	($29,606,452)	($28,007,877)	($26,454,002)	($24,940,961)	($23,465,406)	($24,893,991)	($26,117,618)
29																		
30	Trimble CCR to On-Site Landfill																	
31		Year 1	Year 2	Year 3	Year 4			$123,800,000	$81,300,000	$65,100,000								$0
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$25,300,000	$149,100,000	$230,400,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000						$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000
34	Phase III	$28,700,000	$26,200,000	$4,700,000						$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000						$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant					$0	$25,300,000	$149,100,000	$230,400,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$324,200,000	$350,400,000
38	Less Accumulated Depreciation							$0	$0	($13,431,818)	($26,863,636)	($40,295,455)	($53,727,273)	($67,159,091)	($80,590,909)	($94,022,727)	($107,454,545)	($120,886,364)
39	Less Deferred Tax Balance							$0	$0	$914,371	($2,158,856)	($4,609,057)	($6,484,510)	($7,826,598)	($8,676,702)	($9,070,456)	($9,043,495)	($8,947,565)
40	Environmental Compliance Rate Base					$0	$25,300,000	$149,100,000	$230,400,000	$282,982,553	$266,477,508	$250,595,489	$235,288,217	$220,514,311	$206,232,389	$192,406,817	$207,701,959	$220,566,072
41	Return on Environmental Rate Base					10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)			PVRR	$224,024,311	$0	$2,530,000	$14,910,000	$23,040,000	$28,298,255	$26,647,751	$25,059,549	$23,528,822	$22,051,431	$20,623,239	$19,240,682	$20,770,196	$22,056,607
43																		
44	Operating Expenses per cu yd		$ 12.47		Inflation													
45	Operating Expenses Net (75%)		$ 9.35	cu yd	2.50%				$384,000	$5,957,543	$6,106,481	$6,259,143	$6,415,622	$6,576,012	$6,740,413	$6,908,923	$7,081,646	$7,258,687
46	Annual Depreciation							$0	$0	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
47	Annual Property Tax Expense						$0	$37,950	$223,650	$345,600	$423,102	$402,955	$382,807	$362,659	$342,511	$322,364	$302,216	$325,118
48	Total Operating E(m)			PVRR	$240,405,055	$0	$0	$37,950	$607,650	$19,734,961	$19,961,402	$20,093,916	$20,230,247	$20,370,489	$20,514,742	$20,663,105	$20,815,680	$21,015,623
49	Total Capital + Operating E(m) CCR to Landfill			**PVRR**	**$464,429,366**	$0	$2,530,000	$14,947,950	$23,647,650	$48,033,216	$46,609,152	$45,153,465	$43,759,068	$42,421,921	$41,137,981	$39,903,786	$41,585,876	$43,072,231
50	**All in Annual Cost per Cubic Yd**									**$75.41**	**$73.17**	**$70.88**	**$68.70**	**$66.60**	**$64.58**	**$62.64**	**$65.28**	**$67.62**

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**					12/31/2014	12/31/2015	12/30/2016	12/31/2017	12/31/2018	12/31/2019	12/30/2020	12/31/2021	12/31/2022	12/31/2023	12/30/2024	12/31/2025	12/31/2026
51	Assumed Cubic Yards	637,000	Yr b/w Dates	910,000				Cumulative Cubic Yards -->		637,000	1,274,000	1,911,000	2,548,000	3,185,000	3,822,000	4,459,000	5,096,000	5,733,000
52	Phase I Commence Date	1/1/2018	9	8,190,000														
53	Phase II In Service Date	1/1/2027	7	6,370,000						$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000
54	Phase III In Service Date	1/1/2034	11	10,010,000						$0	$0	$0	$0	$0	$0	$0	$0	$0
55	Phase IV In Service Date	1/1/2045	9	8,190,000						$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000														
57	Cummulative Cu Yd to begin Phase II			4,549,999														
58	Cumulative Cu Yd to begin Phase III			12,011,999														
59	Cumulative Cu Yd to begin Phase IV			23,932,999														
60	1 Depreciation Year									1	2	3	4	5	6	7	8	9
61	Sterling Book Depreciation Years			37				$0		$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284
62	Tax Depreciation (20yr MACRS unless life < 20yrs)			20				$0		$986,906	$1,899,860	$1,757,219	$1,625,632	$1,503,519	$1,390,880	$1,286,399	$1,190,077	$1,174,287
63	Difference							$0	$0	($275,622)	($1,188,577)	($1,045,936)	($914,348)	($792,235)	($679,596)	($575,116)	($478,794)	($463,003)
64	Rate							38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax							$0	$0	($107,217)	($462,356)	($406,869)	($355,681)	($308,179)	($264,363)	($223,720)	($186,251)	($180,108)
66	Accumulated Deferred Tax Balance							$0	$0	($107,217)	($569,573)	($976,442)	($1,332,124)	($1,640,303)	($1,904,666)	($2,128,386)	($2,314,637)	($2,494,745)
67	MACRS Tax Depreciation Rate									3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%
68																		
69	Depreciation Year									1	2	3	4	5	6	7	8	9
70	Phase 1 Book Depreciation Years			22				$0	$0	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
71	Tax Depreciation (20yr MACRS unless life < 20yrs)			20				$0	$0	$11,081,250	$21,332,145	$19,730,535	$18,253,035	$16,881,915	$15,617,175	$14,444,040	$13,362,510	$13,185,210
72	Difference							$0	$0	$2,350,568	($7,900,327)	($6,298,717)	($4,821,217)	($3,450,097)	($2,185,357)	($1,012,222)	$69,308	$246,608
73	Rate							38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax							$0	$0	$914,371	($3,073,227)	($2,450,201)	($1,875,453)	($1,342,088)	($850,104)	($393,754)	$26,961	$95,931
75	Accumulated Deferred Tax Balance							$0	$0	$914,371	($2,158,856)	($4,609,057)	($6,484,510)	($7,826,598)	($8,676,702)	($9,070,456)	($9,043,495)	($8,947,565)
76	MACRS Tax Depreciation Rate									3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%
77																		
78	Depreciation Year									0	0	0	0	0	0	0	0	0
79	Phase 2 Book Depreciation Years			22						$0	$0	$0	$0	$0	$0	$0	$0	$0
80	Tax Depreciation			20						$0	$0	$0	$0	$0	$0	$0	$0	$0
81	Difference									$0	$0	$0	$0	$0	$0	$0	$0	$0
82	Rate									38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax									$0	$0	$0	$0	$0	$0	$0	$0	$0
84	Accumulated Deferred Tax Balance									$0	$0	$0	$0	$0	$0	$0	$0	$0
85	MACRS Tax Depreciation Rate									0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
86																		
87	Depreciation Year									0	0	0	0	0	0	0	0	0
88	Phase 3 Book Depreciation Years			22						$0	$0	$0	$0	$0	$0	$0	$0	$0
89	Tax Depreciation (20yr MACRS unless life < 20yrs)			20						$0	$0	$0	$0	$0	$0	$0	$0	$0
90	Difference									$0	$0	$0	$0	$0	$0	$0	$0	$0
91	Rate									38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax									$0	$0	$0	$0	$0	$0	$0	$0	$0
93	Accumulated Deferred Tax Balance									$0	$0	$0	$0	$0	$0	$0	$0	$0
94	MACRS Tax Depreciation Rate									0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
95																		
96	Depreciation Year									0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years			22						$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)			20						$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference									$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate									38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax									$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance									$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate									0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA														
2	**Trimble CCR to Sterling Materials**						12/31/2027	12/30/2028	12/31/2029	12/30/2030	12/31/2031	12/30/2032	12/31/2033	12/31/2034	12/31/2035	12/30/2036	12/31/2037	12/31/2038
3	Tons	1.17	**745,290**	745,290			6,370,000	7,007,000	7,644,000	8,281,000	8,918,000	9,555,000	10,192,000	10,829,000	11,466,000	12,103,000	12,740,000	13,377,000
4	Cubic yards		**637,000**	637,000	Cumulative Cu Yd		6,430,000	6,393,000	6,356,000	6,319,000	6,282,000	6,245,000	6,208,000	6,171,000	6,134,000	6,097,000	6,060,000	6,023,000
5	Gross Price per ton		$ **16.80**	Fee + transport barge to mine														
6	0.75% IMPA/IMEA		$ **12.60**	Net cost to KU/LGE														
7	Revenue Requirement																	
8	On-Load and Off-Load Barge Facilities						$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant						$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500
11	Less Accumulated Depreciation						($7,112,838)	($7,824,122)	($8,535,405)	($9,246,689)	($9,957,973)	($10,669,257)	($11,380,541)	($12,091,824)	($12,803,108)	($13,514,392)	($14,225,676)	($14,936,959)
12	Less Deferred Tax Balance						($2,674,751)	($2,854,859)	($3,034,865)	($3,214,973)	($3,394,979)	($3,575,087)	($3,755,093)	($3,935,201)	($4,115,207)	($4,295,315)	($4,475,321)	($4,427,030)
13	Environmental Compliance Rate Base						$16,529,911	$15,638,519	$14,747,230	$13,855,838	$12,964,548	$12,073,156	$11,181,867	$10,290,475	$9,399,185	$8,507,793	$7,616,503	$6,953,510
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR	$19,295,322	$1,652,991	$1,563,852	$1,474,723	$1,385,584	$1,296,455	$1,207,316	$1,118,187	$1,029,047	$939,919	$850,779	$761,650	$695,351
16																		
17	Barge Shipping Costs		$ 1.96	745,290			$1,824,300	$1,869,907	$1,916,655	$1,964,571	$2,013,685	$2,064,028	$2,115,628	$2,168,519	$2,222,732	$2,278,300	$2,335,258	$2,393,639
18	Barge Facilities' Operating Costs					Inflation Assumption	$1,030,312	$1,056,070	$1,082,471	$1,109,533	$1,137,272	$1,165,703	$1,194,846	$1,224,717	$1,255,335	$1,286,718	$1,318,886	$1,351,859
19	CCR to Storage Facility @		$ 12.60	per ton		2.50%	$11,727,640	$12,020,831	$12,321,352	$12,629,386	$12,945,120	$13,268,748	$13,600,467	$13,940,479	$14,288,991	$14,646,215	$15,012,371	$15,387,680
20	Warsaw Land Lease						$249,773	$256,017	$262,417	$268,978	$275,702	$282,595	$289,660	$296,901	$304,324	$311,932	$319,730	$327,723
21	Operating Expenses						$14,832,024	$15,202,825	$15,582,895	$15,972,468	$16,371,779	$16,781,074	$17,200,601	$17,630,616	$18,071,381	$18,523,166	$18,986,245	$19,460,901
22	Annual Depreciation						$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284
23	Annual Property Tax Expense						$29,874	$28,807	$27,740	$26,673	$25,606	$24,539	$23,472	$22,405	$21,339	$20,272	$19,205	$18,138
24	Total Operating E(m)				PVRR	$188,218,444	$15,573,182	$15,942,916	$16,321,919	$16,710,425	$17,108,669	$17,516,897	$17,935,357	$18,364,305	$18,804,003	$19,254,721	$19,716,733	$20,190,323
25	Total E(m) CCR to Sterling				**PVRR**	**$207,513,765**	$17,226,173	$17,506,767	$17,796,642	$18,096,008	$18,405,124	$18,724,213	$19,053,544	$19,393,352	$19,743,922	$20,105,500	$20,478,384	$20,885,674
26	**All-in Annual Cost per Cubic Yd**						**$27.04**	**$27.48**	**$27.94**	**$28.41**	**$28.89**	**$29.39**	**$29.91**	**$30.44**	**$31.00**	**$31.56**	**$32.15**	**$32.79**
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$464,429,366**	$44,993,097	$43,491,719	$41,999,461	$40,523,622	$39,063,704	$37,618,751	$36,188,389	$34,771,787	$33,362,105	$34,827,859	$36,092,420	$37,922,023
28	**PVRR Comparative (savings) cost**				**6.70%**	**($256,915,601)**	($27,766,924)	($25,984,951)	($24,202,819)	($22,427,614)	($20,658,580)	($18,894,539)	($17,134,846)	($15,378,435)	($13,618,183)	($14,722,358)	($15,614,036)	($17,036,349)
29																		
30	Trimble CCR to On-Site Landfill																	
31		Year 1	Year 2	Year 3	Year 4		$0	$0					$0					$0
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$5,600,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000	$4,700,000
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0		$0	$0	$0	$0
37	Revised Eligible Plant						$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$384,700,000	$410,900,000	$415,600,000
38	Less Accumulated Depreciation						($137,068,182)	($153,250,000)	($169,431,818)	($185,613,636)	($201,795,455)	($217,977,273)	($234,159,091)	($250,340,909)	($266,522,727)	($282,704,545)	($298,886,364)	($317,777,273)
39	Less Deferred Tax Balance						($8,663,278)	($9,196,553)	($9,601,122)	($9,889,167)	($10,066,863)	($10,144,981)	($10,128,517)	($10,027,067)	($9,910,346)	($9,794,539)	($9,677,819)	($6,813,067)
40	Environmental Compliance Rate Base						$210,268,540	$193,553,447	$176,967,060	$160,497,196	$144,137,682	$127,877,746	$111,712,392	$95,632,024	$79,566,927	$92,200,915	$102,335,818	$91,009,660
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR	$224,024,311	$21,026,854	$19,355,345	$17,696,706	$16,049,720	$14,413,768	$12,787,775	$11,171,239	$9,563,202	$7,956,693	$9,220,092	$10,233,582	$9,100,966
43																		
44	Operating Expenses per cu yd		$ 12.47			Inflation												
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$7,440,154	$7,626,158	$7,816,812	$8,012,232	$8,212,538	$8,417,852	$8,628,298	$8,844,005	$9,065,105	$9,291,733	$9,524,026	$9,762,127
46	Annual Depreciation						$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$18,890,909
47	Annual Property Tax Expense						$344,270	$328,398	$304,125	$279,852	$255,580	$231,307	$207,034	$182,761	$158,489	$134,216	$152,993	$168,020
48	Total Operating E(m)				PVRR	$240,405,055	$23,966,243	$24,136,374	$24,302,755	$24,473,903	$24,649,936	$24,830,977	$25,017,150	$25,208,585	$25,405,412	$25,607,767	$25,858,838	$28,821,057
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$464,429,366**	$44,993,097	$43,491,719	$41,999,461	$40,523,622	$39,063,704	$37,618,751	$36,188,389	$34,771,787	$33,362,105	$34,827,859	$36,092,420	$37,922,023
50	**All in Annual Cost per Cubic Yd**						**$70.63**	**$68.28**	**$65.93**	**$63.62**	**$61.32**	**$59.06**	**$56.81**	**$54.59**	**$52.37**	**$54.67**	**$56.66**	**$59.53**

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**					12/31/2027	12/30/2028	12/29/2029	12/30/2030	12/31/2031	12/30/2032	12/31/2033	12/31/2034	12/31/2035	12/30/2036	12/31/2037	12/31/2038
51	Assumed Cubic Yards	637,000	Yr b/w Dates	910,000		6,370,000	7,007,000	7,644,000	8,281,000	8,918,000	9,555,000	10,192,000	10,829,000	11,466,000	12,103,000	12,740,000	13,377,000
52	Phase I Commence Date	1/1/2018	9	8,190,000													
53	Phase II In Service Date	1/1/2027	7	6,370,000		$5,600,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
54	Phase III In Service Date	1/1/2034	11	10,010,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000	$4,700,000
55	Phase IV In Service Date	1/1/2045	9	8,190,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000													
57	Cummulative Cu Yd to begin Phase II			4,549,999													
58	Cumulative Cu Yd to begin Phase III			12,011,999													
59	Cumulative Cu Yd to begin Phase IV			23,932,999													
60	1 Depreciation Year					10	11	12	13	14	15	16	17	18	19	20	21
61	Sterling Book Depreciation Years			37		$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284
62	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$1,174,024	$1,174,287	$1,174,024	$1,174,287	$1,174,024	$1,174,287	$1,174,024	$1,174,287	$1,174,024	$1,174,287	$1,174,024	$587,143
63	Difference					($462,740)	($463,003)	($462,740)	($463,003)	($462,740)	($463,003)	($462,740)	($463,003)	($462,740)	($463,003)	($462,740)	$124,140
64	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax					($180,006)	($180,108)	($180,006)	($180,108)	($180,006)	($180,108)	($180,006)	($180,108)	($180,006)	($180,108)	($180,006)	$48,291
66	Accumulated Deferred Tax Balance					($2,674,751)	($2,854,859)	($3,034,865)	($3,214,973)	($3,394,979)	($3,575,087)	($3,755,093)	($3,935,201)	($4,115,207)	($4,295,315)	($4,475,321)	($4,427,030)
67	MACRS Tax Depreciation Rate					4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%
68																	
69	Depreciation Year					10	11	12	13	14	15	16	17	18	19	20	21
70	Phase 1 Book Depreciation Years			22		$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
71	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$6,592,605
72	Difference					$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$6,839,213
73	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax					$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$2,660,454
75	Accumulated Deferred Tax Balance					($8,850,485)	($8,754,554)	($8,657,474)	($8,561,543)	($8,464,463)	($8,368,533)	($8,271,453)	($8,175,522)	($8,078,442)	($7,982,511)	($7,885,431)	($5,224,977)
76	MACRS Tax Depreciation Rate					4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%
77																	
78	Depreciation Year					1	2	3	4	5	6	7	8	9	10	11	12
79	Phase 2 Book Depreciation Years			22		$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000
80	Tax Depreciation			20		$2,268,750	$4,367,495	$4,039,585	$3,737,085	$3,456,365	$3,197,425	$2,957,240	$2,735,810	$2,699,510	$2,698,905	$2,699,510	$2,698,905
81	Difference					$481,250	($1,617,495)	($1,289,585)	($987,085)	($706,365)	($447,425)	($207,240)	$14,190	$50,490	$51,095	$50,490	$51,095
82	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax					$187,206	($629,206)	($501,649)	($383,976)	($274,776)	($174,048)	($80,616)	$5,520	$19,641	$19,876	$19,641	$19,876
84	Accumulated Deferred Tax Balance					$187,206	($441,999)	($943,648)	($1,327,624)	($1,602,400)	($1,776,448)	($1,857,065)	($1,851,545)	($1,831,904)	($1,812,028)	($1,792,388)	($1,772,512)
85	MACRS Tax Depreciation Rate					3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%	4.461%	4.462%	4.461%
86																	
87	Depreciation Year					0	0	0	0	0	0	0	0	0	0	0	1
88	Phase 3 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,709,091
89	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,235,000
90	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$474,091
91	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$184,421
93	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$184,421
94	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	3.750%
95																	
96	Depreciation Year					0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA														
2	**Trimble CCR to Sterling Materials**						12/31/2039	12/30/2040	12/31/2041	12/31/2042	12/31/2043	12/30/2044	12/30/2045	12/30/2046	12/30/2047	12/29/2048	12/29/2049	12/29/2050
3	Tons	1.17	**745,290**	745,290														
4	Cubic yards		**637,000**	637,000	Cumulative Cu Yd		14,014,000	14,651,000	15,288,000	15,925,000	16,562,000	17,199,000	17,836,000	18,473,000	19,110,000	19,747,000	20,384,000	21,021,000
5	Gross Price per ton		**$ 16.80**	Fee + transport barge to mine			5,986,000	5,949,000	5,912,000	5,875,000	5,838,000	5,801,000	5,764,000	5,727,000	5,690,000	5,653,000	5,616,000	5,579,000
6	0.75% IMPA/IMEA		**$ 12.60**	Net cost to KU/LGE														
7	Revenue Requirement																	
8	On-Load and Off-Load Barge Facilities						$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant						$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500
11	Less Accumulated Depreciation						($15,648,243)	($16,359,527)	($17,070,811)	($17,782,095)	($18,493,378)	($19,204,662)	($19,915,946)	($20,627,230)	($21,338,514)	($22,049,797)	($22,761,081)	($23,472,365)
12	Less Deferred Tax Balance						($4,150,341)	($3,873,651)	($3,596,962)	($3,320,273)	($3,043,583)	($2,766,894)	($2,490,205)	($2,213,515)	($1,936,826)	($1,660,136)	($1,383,447)	($1,106,758)
13	Environmental Compliance Rate Base						$6,518,916	$6,084,321	$5,649,727	$5,215,133	$4,780,538	$4,345,944	$3,911,350	$3,476,755	$3,042,161	$2,607,566	$2,172,972	$1,738,378
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR	$19,295,322	$651,892	$608,432	$564,973	$521,513	$478,054	$434,594	$391,135	$347,676	$304,216	$260,757	$217,297	$173,838
16																		
17	Barge Shipping Costs		$ 1.96	745,290			$2,453,480	$2,514,817	$2,577,688	$2,642,130	$2,708,183	$2,775,888	$2,845,285	$2,916,417	$2,989,327	$3,064,060	$3,140,662	$3,219,178
18	Barge Facilities' Operating Costs				Inflation Assumption		$1,385,655	$1,420,296	$1,455,804	$1,492,199	$1,529,504	$1,567,741	$1,606,935	$1,647,108	$1,688,286	$1,730,493	$1,773,756	$1,818,099
19	CCR to Storage Facility @		$ 12.60	per ton	2.50%		$15,772,372	$16,166,681	$16,570,848	$16,985,120	$17,409,748	$17,844,991	$18,291,116	$18,748,394	$19,217,104	$19,697,531	$20,189,970	$20,694,719
20	Warsaw Land Lease						$335,916	$344,314	$352,922	$361,745	$370,789	$380,059	$389,560	$399,299	$409,281	$419,514	$430,001	$440,751
21	Operating Expenses						$19,947,424	$20,446,109	$20,957,262	$21,481,193	$22,018,223	$22,568,679	$23,132,896	$23,711,218	$24,303,999	$24,911,599	$25,534,389	$26,172,748
22	Annual Depreciation						$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284
23	Annual Property Tax Expense						$17,071	$16,004	$14,937	$13,870	$12,803	$11,736	$10,669	$9,602	$8,535	$7,468	$6,402	$5,335
24	Total Operating E(m)				PVRR	$188,218,444	$20,675,778	$21,173,397	$21,683,483	$22,206,347	$22,742,310	$23,291,699	$23,854,849	$24,432,104	$25,023,818	$25,630,351	$26,252,074	$26,889,367
25	Total E(m) CCR to Sterling				**PVRR**	**$207,513,765**	$21,327,670	$21,781,829	$22,248,455	$22,727,860	$23,220,364	$23,726,293	$24,245,984	$24,779,780	$25,328,034	$25,891,107	$26,469,371	$27,063,204
26	**All-in Annual Cost per Cubic Yd**						**$33.48**	**$34.19**	**$34.93**	**$35.68**	**$36.45**	**$37.25**	**$38.06**	**$38.90**	**$39.76**	**$40.65**	**$41.55**	**$42.49**
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$464,429,366**	$36,718,176	$22,914,836	$22,581,284	$22,264,924	$21,965,033	$21,681,105	$21,412,542	$21,152,469	$20,952,154	$20,811,755	$18,097,024	$18,144,205
28	**PVRR Comparative (savings) cost**				**6.70%**	**($256,915,601)**	($15,390,506)	($1,133,007)	($332,829)	$462,937	$1,255,331	$2,045,188	$2,833,442	$3,627,311	$4,375,880	$5,079,352	$8,372,347	$8,918,999
29																		
30	Trimble CCR to On-Site Landfill																	
31		Year 1	Year 2	Year 3	Year 4		$0	$0	$0									
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant						$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000
38	Less Accumulated Depreciation						($336,668,182)	($342,127,273)	($347,586,364)	($353,045,455)	($358,504,545)	($363,963,636)	($369,422,727)	($374,881,818)	($380,340,909)	($385,800,000)	($388,509,091)	($391,218,182)
39	Less Deferred Tax Balance						($2,188,295)	($2,662,605)	($3,021,229)	($3,272,041)	($3,423,860)	($3,483,401)	($3,458,322)	($3,419,098)	($2,854,822)	($1,765,724)	($1,746,144)	($1,726,795)
40	Environmental Compliance Rate Base						$76,743,523	$70,810,122	$64,992,408	$59,282,504	$53,671,595	$48,152,963	$42,718,950	$37,299,084	$32,404,269	$28,034,276	$25,344,765	$22,655,023
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR	$224,024,311	$7,674,352	$7,081,012	$6,499,241	$5,928,250	$5,367,159	$4,815,296	$4,271,895	$3,729,908	$3,240,427	$2,803,428	$2,534,477	$2,265,502
43																		
44	Operating Expenses per cu yd		$ 12.47			Inflation												
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$10,006,180	$10,256,335	$10,512,743	$10,775,562	$11,044,951	$11,321,075	$11,604,101	$11,894,204	$12,191,559	$12,496,348	$12,808,757	$13,128,976
46	Annual Depreciation						$18,890,909	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$2,709,091	$2,709,091
47	Annual Property Tax Expense						$146,734	$118,398	$110,209	$102,020	$93,832	$85,643	$77,455	$69,266	$61,077	$52,889	$44,700	$40,636
48	Total Operating E(m)				PVRR	$240,405,055	$29,043,823	$15,833,823	$16,082,043	$16,336,673	$16,597,873	$16,865,809	$17,140,647	$17,422,561	$17,711,727	$18,008,328	$15,562,548	$15,878,703
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$464,429,366**	$36,718,176	$22,914,836	$22,581,284	$22,264,924	$21,965,033	$21,681,105	$21,412,542	$21,152,469	$20,952,154	$20,811,755	$18,097,024	$18,144,205
50	**All in Annual Cost per Cubic Yd**						**$57.64**	**$35.97**	**$35.45**	**$34.95**	**$34.48**	**$34.04**	**$33.61**	**$33.21**	**$32.89**	**$32.67**	**$28.41**	**$28.48**

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**					12/31/2039	12/30/2040	12/31/2041	12/31/2042	12/31/2043	12/30/2044	12/30/2045	12/30/2046	12/30/2047	12/29/2048	12/29/2049	12/29/2050
51	Assumed Cubic Yards	**637,000**	Yr b/w Dates	910,000		14,014,000	14,651,000	15,288,000	15,925,000	16,562,000	17,199,000	17,836,000	18,473,000	19,110,000	19,747,000	20,384,000	21,021,000
52	Phase I Commence Date	1/1/2018	9	8,190,000													
53	Phase II In Service Date	1/1/2027	7	6,370,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
54	Phase III In Service Date	1/1/2034	11	10,010,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
55	Phase IV In Service Date	1/1/2045	9	8,190,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000													
57	Cummulative Cu Yd to begin Phase II			4,549,999													
58	Cumulative Cu Yd to begin Phase III			12,011,999													
59	Cumulative Cu Yd to begin Phase IV			23,932,999													
60		1 Depreciation Year				22	23	24	25	26	27	28	29	30	31	32	33
61	Sterling	Book Depreciation Years		37		$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284
62		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
63		Difference				$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284	$711,284
64		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65		Deferred Tax				$276,689	$276,689	$276,689	$276,689	$276,689	$276,689	$276,689	$276,689	$276,689	$276,689	$276,689	$276,689
66		Accumulated Deferred Tax Balance				($4,150,341)	($3,873,651)	($3,596,962)	($3,320,273)	($3,043,583)	($2,766,894)	($2,490,205)	($2,213,515)	($1,936,826)	($1,660,136)	($1,383,447)	($1,106,758)
67		MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
68																	
69		Depreciation Year				22	23	24	25	26	27	28	29	30	31	32	33
70	Phase 1	Book Depreciation Years		22		$13,431,818	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
71		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
72		Difference				$13,431,818	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
73		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74		Deferred Tax				$5,224,977	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
75		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
76		MACRS Tax Depreciation Rate															
77																	
78		Depreciation Year				13	14	15	16	17	18	19	20	21	22	23	24
79	Phase 2	Book Depreciation Years		22		$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$0	$0
80		Tax Depreciation		20		$2,699,510	$2,698,905	$2,699,510	$2,698,905	$2,699,510	$2,698,905	$2,699,510	$2,698,905	$1,349,755	$0	$0	$0
81		Difference				$50,490	$51,095	$50,490	$51,095	$50,490	$51,095	$50,490	$51,095	$1,400,245	$2,750,000	$0	$0
82		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83		Deferred Tax				$19,641	$19,876	$19,641	$19,876	$19,641	$19,876	$19,641	$19,876	$544,695	$1,069,750	$0	$0
84		Accumulated Deferred Tax Balance				($1,752,871)	($1,732,995)	($1,713,354)	($1,693,478)	($1,673,838)	($1,653,962)	($1,634,321)	($1,614,445)	($1,069,750)	$0	$0	$0
85		MACRS Tax Depreciation Rate				4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%	0.000%	0.000%	0.000%
86																	
87		Depreciation Year				2	3	4	5	6	7	8	9	10	11	12	13
88	Phase 3	Book Depreciation Years		22		$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091
89		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$4,302,524	$3,979,492	$3,681,492	$3,404,948	$3,149,860	$2,913,248	$2,695,112	$2,659,352	$2,658,756	$2,659,352	$2,658,756	$2,659,352
90		Difference				($1,593,433)	($1,270,401)	($972,401)	($695,857)	($440,769)	($204,157)	$13,979	$49,739	$50,335	$49,739	$50,335	$49,739
91		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92		Deferred Tax				($619,845)	($494,186)	($378,264)	($270,688)	($171,459)	($79,417)	$5,438	$19,348	$19,580	$19,348	$19,580	$19,348
93		Accumulated Deferred Tax Balance				($435,424)	($929,610)	($1,307,874)	($1,578,563)	($1,750,022)	($1,829,439)	($1,824,001)	($1,804,653)	($1,785,072)	($1,765,724)	($1,746,144)	($1,726,795)
94		MACRS Tax Depreciation Rate				7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%	4.461%	4.462%	4.461%	4.462%
95																	
96		Depreciation Year				0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4	Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99		Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101		Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103		MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA					End of Life									
2	**Trimble CCR to Sterling Materials**						12/29/2051	12/28/2052	12/28/2053	12/28/2054	12/28/2055	12/27/2056	12/27/2057	12/27/2058	12/27/2059	12/26/2060	12/26/2061	12/26/2062
3	Tons	1.17	**745,290**	745,290														
4	Cubic yards		**637,000**	637,000	Cumulative Cu Yd		21,658,000	22,295,000	22,932,000	23,569,000								
5	Gross Price per ton		**$ 16.80**	Fee + transport barge to mine			5,542,000	5,505,000	5,468,000	5,431,000								
6	0.75% IMPA/IMEA		**$ 12.60**	Net cost to KU/LGE														
7	Revenue Requirement																	
8	On-Load and Off-Load Barge Facilities						$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant						$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500
11	Less Accumulated Depreciation						($24,183,649)	($24,894,932)	($25,606,216)	($26,317,500)	($26,317,500)	($26,317,500)	($26,317,500)	($26,317,500)	($26,317,500)	($26,317,500)	($26,317,500)	($26,317,500)
12	Less Deferred Tax Balance						($830,068)	($553,379)	($276,689)	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	Environmental Compliance Rate Base						$1,303,783	$869,189	$434,594	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR	$19,295,322	$130,378	$86,919	$43,459	$0	$0	$0	$0	$0	$0	$0	$0	$0
16																		
17	Barge Shipping Costs		$ 1.96	745,290			$3,299,658	$3,382,149	$3,466,703	$3,553,371	$0	$0	$0	$0	$0	$0	$0	$0
18	Barge Facilities' Operating Costs				Inflation Assumption		$1,863,552	$1,910,141	$1,957,894	$2,006,842	$0							
19	CCR to Storage Facility @		$ 12.60	per ton	2.50%		$21,212,087	$21,742,389	$22,285,949	$22,843,097	$0	$0	$0	$0	$0	$0	$0	$0
20	Warsaw Land Lease						$451,770	$463,064	$474,641	$486,507	$0	$0	$0	$0	$0	$0	$0	$0
21	Operating Expenses						$26,827,067	$27,497,744	$28,185,187	$28,889,817	$0	$0	$0	$0	$0	$0	$0	$0
22	Annual Depreciation						$711,284	$711,284	$711,284	$711,284	$0	$0	$0	$0	$0	$0	$0	$0
23	Annual Property Tax Expense						$4,268	$3,201	$2,134	$1,067	$0	$0	$0	$0	$0	$0	$0	$0
24	Total Operating E(m)				PVRR	$188,218,444	$27,542,618	$28,212,228	$28,898,605	$29,602,168	$0	$0	$0	$0	$0	$0	$0	$0
25	Total E(m) CCR to Sterling				**PVRR**	**$207,513,765**	$27,672,997	$28,299,147	$28,942,064	$29,602,168	$0	$0	$0	$0	$0	$0	$0	$0
26	**All-in Annual Cost per Cubic Yd**						**$43.44**	**$44.43**	**$45.43**	**$46.47**								
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$464,429,366**	$18,199,415	$18,262,807	$18,334,633	$18,415,057	$3,650,110	$3,377,072	$3,104,057	$2,882,744	$2,713,155	($0)	($0)	($0)
28	**PVRR Comparative (savings) cost**				**6.70%**	**($256,915,601)**	$9,473,582	$10,036,340	$10,607,431	$11,187,111	($3,650,110)	($3,377,072)	($3,104,057)	($2,882,744)	($2,713,155)	$0	$0	$0
29																		
30	Trimble CCR to On-Site Landfill																	
31		Year 1	Year 2	Year 3	Year 4							$0						
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant						$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000
38	Less Accumulated Depreciation						($393,927,273)	($396,636,364)	($399,345,455)	($402,054,545)	($404,763,636)	($407,472,727)	($410,181,818)	($412,890,909)	($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)
39	Less Deferred Tax Balance						($1,707,215)	($1,687,866)	($1,668,286)	($1,648,938)	($1,629,357)	($1,610,009)	($1,590,429)	($1,053,836)	$0	$0	$0	$0
40	Environmental Compliance Rate Base						$19,965,512	$17,275,770	$14,586,259	$11,896,517	$9,207,006	$6,517,264	$3,827,753	$1,655,255	($0)	($0)	($0)	($0)
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR	$224,024,311	$1,996,551	$1,727,577	$1,458,626	$1,189,652	$920,701	$651,726	$382,775	$165,525	($0)	($0)	($0)	($0)
43																		
44	Operating Expenses per cu yd		$ 12.47			Inflation												
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$13,457,200	$13,793,630	$14,138,471	$14,491,933			$0	$0	$0	$0	$0	$0
46	Annual Depreciation						$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$0	$0	$0
47	Annual Property Tax Expense						$36,573	$32,509	$28,445	$24,382	$20,318	$16,255	$12,191	$8,127	$4,064	($0)	($0)	($0)
48	Total Operating E(m)				PVRR	$240,405,055	$16,202,864	$16,535,230	$16,876,007	$17,225,405	$2,729,409	$2,725,345	$2,721,282	$2,717,218	$2,713,155	($0)	($0)	($0)
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$464,429,366**	$18,199,415	$18,262,807	$18,334,633	$18,415,057	$3,650,110	$3,377,072	$3,104,057	$2,882,744	$2,713,155	($0)	($0)	($0)
50	**All in Annual Cost per Cubic Yd**						**$28.57**	**$28.67**	**$28.78**	**$28.91**	**$5.73**	**$5.30**	**$4.87**	**$4.53**	**$4.26**	**($0.00)**	**($0.00)**	**($0.00)**

									End of Life								
1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA														
2	**Trimble CCR to Sterling Materials**					12/29/2051	12/28/2052	12/28/2053	12/28/2054	12/28/2055	12/27/2056	12/27/2057	12/27/2058	12/27/2059	12/26/2060	12/26/2061	12/26/2062
51	Assumed Cubic Yards	**637,000**	Yr b/w Dates	910,000		21,658,000	22,295,000	22,932,000	23,569,000								
52	Phase I Commence Date	1/1/2018	9	8,190,000													
53	Phase II In Service Date	1/1/2027	7	6,370,000		$0	$0	$0	$0								
54	Phase III In Service Date	1/1/2034	11	10,010,000		$0	$0	$0	$0								
55	Phase IV In Service Date	1/1/2045	9	8,190,000		$0	$0	$0	$0								
56	End of 37 Years	1/1/2054	36	33,670,000													
57	Cummulative Cu Yd to begin Phase II			4,549,999													
58	Cumulative Cu Yd to begin Phase III			12,011,999													
59	Cumulative Cu Yd to begin Phase IV			23,932,999													
60	1 Depreciation Year					34	35	36	37	38	39	40	41	42	43	44	45
61	Sterling Book Depreciation Years			37		$711,284	$711,284	$711,284	$711,284	$0	$0	$0	$0	$0	$0	$0	$0
62	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
63	Difference					$711,284	$711,284	$711,284	$711,284	$0	$0	$0	$0	$0	$0	$0	$0
64	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax					$276,689	$276,689	$276,689	$276,689	$0	$0	$0	$0	$0	$0	$0	$0
66	Accumulated Deferred Tax Balance					($830,068)	($553,379)	($276,689)	$0	$0	$0	$0	$0	$0	$0	$0	$0
67	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	$0	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
68																	
69	Depreciation Year					34	35	36	37	38	39	40	41	42	43	44	45
70	Phase 1 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
71	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
72	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
73	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
75	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0		$0	$0	$0	$0
76	MACRS Tax Depreciation Rate																
77																	
78	Depreciation Year					25	26	27	28	29	30	31	32	33	34	35	36
79	Phase 2 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
80	Tax Depreciation			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
81	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
82	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
84	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
85	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
86																	
87	Depreciation Year					14	15	16	17	18	19	20	21	22	23	24	25
88	Phase 3 Book Depreciation Years			22		$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$0	$0	$0
89	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$2,658,756	$2,659,352	$2,658,756	$2,659,352	$2,658,756	$2,659,352	$2,658,756	$1,329,676	$0	$0	$0	$0
90	Difference					$50,335	$49,739	$50,335	$49,739	$50,335	$49,739	$50,335	$1,379,415	$2,709,091	$0	$0	$0
91	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax					$19,580	$19,348	$19,580	$19,348	$19,580	$19,348	$19,580	$536,592	$1,053,836	$0	$0	$0
93	Accumulated Deferred Tax Balance					($1,707,215)	($1,687,866)	($1,668,286)	($1,648,938)	($1,629,357)	($1,610,009)	($1,590,429)	($1,053,836)	$0	$0	$0	$0
94	MACRS Tax Depreciation Rate					4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%	0.000%	0.000%	0.000%	0.000%
95																	
96	Depreciation Year					0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**				Net of IMPA/IMEA										
2	**Trimble CCR to Sterling Materials**						12/26/2063	12/25/2064	12/25/2065	12/25/2066	12/25/2067	12/24/2068	12/24/2069	12/24/2070	Total
3	Tons	1.17	**745,290**	745,290											
4	Cubic yards		**637,000**	637,000	Cumulative Cu Yd										
5	Gross Price per ton		**$ 16.80**	Fee + transport barge to mine											
6	0.75% IMPA/IMEA		**$ 12.60**	Net cost to KU/LGE											
7	Revenue Requirement														
8	On-Load and Off-Load Barge Facilities						$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	
10	Revised Eligible Plant						$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	$26,317,500	
11	Less Accumulated Depreciation						($26,317,500)	($26,317,500)	($26,317,500)	($26,317,500)	($26,317,500)	($26,317,500)	($26,317,500)	($26,317,500)	
12	Less Deferred Tax Balance						$0	$0	$0	$0	$0	$0	$0	$0	
13	Environmental Compliance Rate Base						$0	$0	$0	$0	$0	$0	$0	$0	
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
15	Total Capital E(m)				PVRR	$19,295,322	$0	$0	$0	$0	$0	$0	$0	$0	$40,960,900
16															
17	Barge Shipping Costs		$ 1.96	745,290			$0	$0	$0	$0	$0	$0	$0	$0	
18	Barge Facilities' Operating Costs					Inflation Assumption									
19	CCR to Storage Facility @		$ 12.60	per ton		2.50%	$0	$0	$0	$0	$0	$0	$0	$0	
20	Warsaw Land Lease						$0	$0	$0	$0	$0	$0	$0	$0	
21	Operating Expenses						$0	$0	$0	$0	$0	$0	$0	$0	
22	Annual Depreciation						$0	$0	$0	$0	$0	$0	$0	$0	
23	Annual Property Tax Expense						$0	$0	$0	$0	$0	$0	$0	$0	
24	Total Operating E(m)				PVRR	$188,218,444	$0	$0	$0	$0	$0	$0	$0	$0	
25	Total E(m) CCR to Sterling				**PVRR**	**$207,513,765**	$0	$0	$0	$0	$0	$0	$0	$0	**$777,454,046**
26	**All-in Annual Cost per Cubic Yd**														
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$464,429,366**	($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	**$1,251,291,788**
28	**PVRR Comparative (savings) cost**				**6.70%**	**($256,915,601)**	$0	$0	$0	$0	$0	$0	$0	$0	**($473,837,742)**
29															
30	Trimble CCR to On-Site Landfill														
31		Year 1	Year 2	Year 3	Year 4										
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	
37	Revised Eligible Plant						$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	
38	Less Accumulated Depreciation						($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)	
39	Less Deferred Tax Balance						$0	$0	$0	$0	$0	$0	$0	$0	
40	Environmental Compliance Rate Base						($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
42	Capital E(m)				PVRR	$224,024,311	($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	**$472,036,554**
43															
44	Operating Expenses per cu yd		$ 12.47			Inflation									
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$0	$0	$0	$0	$0	$0	$0	$0	
46	Annual Depreciation						$0	$0	$0	$0	$0	$0	$0	$0	**$415,600,000**
47	Annual Property Tax Expense						($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	
48	Total Operating E(m)				PVRR	$240,405,055	($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	**$779,255,234**
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$464,429,366**	($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	**$1,251,291,788**
50	**All in Annual Cost per Cubic Yd**						**($0.00)**	**($0.00)**	**($0.00)**	**($0.00)**	**($0.00)**	**($0.00)**	**($0.00)**	**($0.00)**	

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA											
2	**Trimble CCR to Sterling Materials**					12/26/2063	12/25/2064	12/25/2065	12/25/2066	12/25/2067	12/24/2068	12/24/2069	12/24/2070	Total
51	Assumed Cubic Yards	637,000	Yr b/w Dates	910,000										
52	Phase I Commence Date	1/1/2018	9	8,190,000										
53	Phase II In Service Date	1/1/2027	7	6,370,000										
54	Phase III In Service Date	1/1/2034	11	10,010,000										
55	Phase IV In Service Date	1/1/2045	9	8,190,000										
56	End of 37 Years	1/1/2054	36	33,670,000										
57	Cummulative Cu Yd to begin Phase II			4,549,999										
58	Cumulative Cu Yd to begin Phase III			12,011,999										
59	Cumulative Cu Yd to begin Phase IV			23,932,999										
60		1 Depreciation Year				46	47	48	49	50	51	52	53	
61	Sterling	Book Depreciation Years		37		$0	$0	$0	$0	$0	$0	$0	$0	$26,317,500
62		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$26,317,500
63		Difference				$0	$0	$0	$0	$0	$0	$0	$0	
64		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
65		Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0
66		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	
67		MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	
68														
69		Depreciation Year				46	47	48	49	50	51	52	53	
70	Phase 1	Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$295,500,000
71		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$295,500,000
72		Difference				$0	$0	$0	$0	$0	$0	$0	$0	
73		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
74		Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0
75		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	
76		MACRS Tax Depreciation Rate												
77														
78		Depreciation Year				37	38	39	40	41	42	43	44	
79	Phase 2	Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$60,500,000
80		Tax Depreciation		20		$0	$0	$0	$0	$0	$0	$0	$0	$60,500,000
81		Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0
82		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
83		Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0
84		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	
85		MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	
86														
87		Depreciation Year				26	27	28	29	30	31	32	33	
88	Phase 3	Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$59,600,000
89		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$59,600,000
90		Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0
91		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
92		Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0
93		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	
94		MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	
95														
96		Depreciation Year				0	0	0	0	0	0	0	0	
97	Phase 4	Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0
98		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0
99		Difference				$0	$0	$0	$0	$0	$0	$0	$0	
100		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
101		Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	
102		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	
103		MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	

Sterling's PVRR Alternative Analysis Support Document

This Support Document explains the assumptions used in the Present Value Revenue Requirement (PVRR) comparative analysis between CCR disposal in the proposed Trimble Generating Station, Ravine B Landfill, as compared to using the Sterling Materials underground mine option for excess CCR. The PVRR comparison follows the model of determining the present value of the total capital and operating cost of each alternative set forth in the original case study analysis for the Trimble Landfill in the original 2009 Application for the CPCN, Attachment B) in the original 2009 Application for the CPCN. (*In the matter of Application of Kentucky Utilities Company for Certificates of Public Convenience and Necessity and Approval of Its 2009 Compliance Plan for Recovery by Environmental Surcharge,* KU Case No. 2009-00197).

The following is a description, with references to supporting documentation, for the applicable line items by row number in the PVRR comparison spreadsheets attached as Exhibits G, S, U, V, and W to this Complaint:

Row 2. The present value calculation of the annual capital and operating expenses was based on a December 31 date.

Row 3. Conversion factor from Cubic Yards to tons is 1.17. (*See* Exhibit P, excerpts from Lee Wilson and Associates, Inc., et al., *Supplement to Alternatives Analysis, LG&E and KU Services Company, Trimble County Generating Station Landfill Project*, December 2014, (the "Sterling Ventures Mine Alterative"), Table III D-3 at 59 of 183, (33.670M cu yds. of CCR converted to 39.393M tons.)

Row 5. The price per ton is Sterling's tipping Fee including transportation from the Barge Unloading Facility on the north edge of Warsaw Kentucky (9 miles south of Sterling's mine on US 42). The price will vary depending on annual tonnage.

Row 6. The net price reflects the Companies' 75% ownership interest.

Row 8. The Companies have estimated the Barge On-Load and Off-Load Facilities to cost a total of $31,900,000 (*See* Exhibit P, Sterling Ventures Mine Alterative, Table III D-3, 59 of 183. The full estimated cost has been projected as follows in

order to cover PPL assumed corporate overheads:

Load/Unload Facility	$31,900,000
10% Overhead/Engineering	3,190,000
Total	$35,090,000
Total 75%	$26,317,500

Row 11. Depreciation is based upon 37 years straight line and assumes depreciation starts on the first day of the in-service year (2018 for Phase I).

Row 12. Deferred Tax Balance for each Phase computed in Rows 63 through 99. Tax depreciation rate is based on 20 year MACRS.

Row 14. Return on Environmental Rate Base per Settlement Agreement in the Companies' 2014 Rate Case.

Row 17. Barge shipping cost based on cost estimate provided in Sterling Ventures Mine Alterative - $2.61 x 75% (*See* Exhibit P, Table III D-3 at 59 of 183).

Row 18. Barge facilities operating cost based on cost estimate provided in Sterling Ventures Mine Alternative - $1,100,000 x 75%= $825,000. (*Id.*)

Row 19. Inflation Assumption. Based on Companies' inflation assumptions for internal labor (3%) and non-labor (2%) in 2015 Business Plan included in 2014 Rate Increase Application – averaged at 2.5% (*See* Exhibit T, Project Engineering 2015 Business Plan, Attachment 1 to Response to Sierra Club Question No. 2.7, Witness Voyles, at 2 of 11).

Row 20. Warsaw Barge site Land Lease based on discussions with site owner.

Row 23. Property Tax Rate of .15%.

Rows 32-35. Cost per year based on Project Engineering 2015 Business Plan that was filed with 2014 Rate Increase Application. (*See id.*, Exhibit T - Note that summary at bottom of spreadsheet added by Sterling). Assumes Phases III and IV cost of $119.2 million will be split equally between phases, and each will have a 3 year build out similar to Phase II.

Rows 44-45. Operating Expenses per cubic yard based on Table III.D-1 of Supplement to Alternatives Analysis, December 2014 (*See* Exhibit P, Sterling Ventures Mine Alterative, (the "Ravine B Alterative") at 57 of 183. Total projected O&M Cost of $221,107,172 divided by 34,162,109 projected cubic yards = $6.47 per cubic yard. However, the Ravine B Alternative omits the cost of operations for treatment of the CCR (see footnote 5 of Ravine B Alternative). The Company projected the cost of treatment to be $6 per cubic yard (*Id.*, Appendix III.D-1 (116 of 183) at 1. Total O & M Expenses assumed to be $12.47 ($6.47 + $6.00) per cubic yard - 9.35 per cu yd at 75%.

Major Assumptions

5. Operational and Other

5.1 Annual escalation rates for internal labor and non-labor are as follows:

- Internal labor: 3.0%.
- Non-labor 2.0%.

5.2 The next turbine overhauls by unit are as follows:

- 2014 : Mill Creek 4, Ghent 4.
- 2015 : Ghent 1, Brown 1.
- 2016 : None scheduled.
- 2017: Brown 2, Trimble 1.
- 2018: Ghent 3, Trimble 2.
- 2019: Ghent 2, Brown 3, Mill Creek 3.

5.3 Significant generator rewind/stator rewind dollars are included in the 2014-2017 timeframe.

- Brown 2 generator (stator and rotor) rewind in 2017 (some dollars also in 2016).
- Spare stator bars ordered and received for Ghent 2-4, Mill Creek 1-4, and TC 1 between 2010 – 2016.
  - The spare sets will be installed on MC4 in 2014, MC3 in 2019, MC2 in 2020, and MC1 in 2021.

Project Engineering 2015 Business Plan
Budget - Investment Accrual (Removal Included)
8/6/2014

DRAFT

2014-2023 Business Plan
2015-2024 Business Plan

$ In Millions	In Service Date	Total Project Forecast	Total Projected LTP	Before 2014 Spend	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TC CCR - Ponds (Net) BAP/GSP	2010	28.6	28.6	28.6	-	-	-	-	-	-	-	-	-	-	-
TC CCR - Ponds (Net) BAP/GSP	2010	28.3	28.3	28.3	-	-	-	-	-	-	-	-	-	-	-
Variance		0.3	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-
TC CCR - Landfill (PH I) (Net) Project	2018	91.6	112.3	10.4	2.2	19.3	27.7	32.3	8.4	10.0	0.5	0.4	0.7	0.4	-
TC CCR - Landfill (PH I) (Net) Project	2018	148.1 1	148.1	12.3	3.1	5.1	44.0	37.7	42.2	0.7	0.7	0.7	0.5	0.7	0.5
Variance		(56.6)	(35.9)	(1.9)	(0.9)	14.2	(16.3)	(5.4)	(33.8)	9.3	(0.2)	(0.3)	0.1	(0.3)	(0.5)
TC CCR - CCR Treatment (Net)	2017	139.3	139.3	1.3	0.5	22.3	74.2	40.9	0.1	-	-	-	-	-	-
TC CCR - CCR Treatment (Net)	2017	152.3 1	152.3	-	-	20.2	68.1	41.4	22.6	-	-	-	-	-	-
Variance		(13.0)	(13.0)	1.3	0.5	2.1	6.0	(0.4)	(22.5)	-	-	-	-	-	-
TC CCR - CCR Transport (Net)	2017	25.9	25.9	7.2	-	6.5	11.4	0.8	-	-	-	-	-	-	-
TC CCR - CCR Transport (Net)	2017	21.5 1	21.5	7.2	-	-	11.7	2.3	0.3	-	-	-	-	-	-
Variance		4.5	4.5	-	-	6.5	(0.2)	(1.5)	(0.3)	-	-	-	-	-	-
TC CCR - Landfill PH II (Net) Project	2027	29.2	29.2	-	-	-	-	-	-	-	-	-	19.0	10.2	-
TC CCR - Landfill PH II (Net) Project	2027	60.4 2	60.4	-	-	-	-	-	-	-	-	-	28.7	26.2	5.6
Variance		(31.2)	(31.2)	-	-	-	-	-	-	-	-	-	(9.7)	(16.0)	(5.6)
TC CCR - Landfill (PH III/IV) (Net) Project	2034/2045	119.2 3	-	-	-	-	-	-	-	-	-	-	-	-	-
TC CCR - Landfill (PH III/IV) (Net) Project	2034/2045	119.2 3	-	-	-	-	-	-	-	-	-	-	-	-	-
Variance		-	-	-	-	-	-	-	-	-	-	-	-	-	-
TC CCR - River Flyash Barge Loading (Net)	2012	9.0	9.0	9.0	-	-	-	-	-	-	-	-	-	-	-
TC CCR - River Flyash Barge Loading (Net)	2012	8.9	8.9	8.9	-	-	-	-	-	-	-	-	-	-	-
Variance		0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-
Total TC CCR - Ponds/Landfill (Net)		**442.8**	**344.3**	**56.5**	**2.7**	**48.1**	**113.3**	**74.0**	**8.5**	**10.0**	**0.5**	**0.4**	**19.7**	**10.6**	**-**
Total TC CCR - Ponds/Landfill (Net)		**538.7**	**419.5**	**56.7**	**3.1**	**25.3**	**123.8**	**81.3**	**65.1**	**0.7**	**0.7**	**0.7**	**29.2**	**26.9**	**6.0**
Variance		(95.9)	(75.2)	(0.2)	(0.4)	22.8	(10.5)	(7.4)	(56.6)	9.3	(0.2)	(0.3)	(9.5)	(16.3)	(6.0)
Total All CCR Projects (TC Net)		**1,285.4**	**1,030.5**	**445.3**	**77.7**	**88.1**	**133.8**	**85.1**	**78.3**	**64.1**	**1.4**	**2.2**	**29.9**	**24.7**	**-**
Total All CCR Projects (TC Net)		**1,422.4**	**1,156.4**	**448.7**	**73.9**	**103.0**	**148.8**	**123.2**	**138.8**	**17.3**	**1.6**	**2.5**	**39.4**	**41.0**	**18.2**
Variance		(137.0)	(125.9)	(3.4)	3.8	(15.0)	(15.0)	(38.1)	(60.6)	46.8	(0.2)	(0.3)	(9.5)	(16.3)	(18.2)
Total Trimble County 2 (Net)	2010	884.5	884.5	880.8	0.8	3.0	-	-	-	-	-	-	-	-	-
Total Trimble County 2 (Net)	2011	887.0	887.0	882.5	1.5	3.0	-	-	-	-	-	-	-	-	-
Variance		(2.5)	(2.5)	(1.7)	(0.7)	-	-	-	-	-	-	-	-	-	-
Trimble Co.2 DSI (Net)	2013	5.5	5.5	2.6	2.9	-	-	-	-	-	-	-	-	-	-
Trimble Co.2 DSI (Net)	2014	6.7	6.7	2.7	3.9	-	-	-	-	-	-	-	-	-	-
Variance		(1.2)	(1.2)	(0.2)	(1.0)	-	-	-	-	-	-	-	-	-	-
Ohio Falls Redevelopment	2016	138.0	138.0	94.8	16.9	16.3	9.9	-	-	-	-	-	-	-	-
Ohio Falls Redevelopment	2017	139.0	139.0	92.8	11.1	15.3	16.0	3.8	-	-	-	-	-	-	-
Variance		(1.0)	(1.0)	2.0	5.8	1.1	(6.1)	(3.8)	-	-	-	-	-	-	-
Cane Run 7	2015	549.0	549.0	387.3	125.5	36.2	-	-	-	-	-	-	-	-	-
Cane Run 7	2015	562.5	562.5	407.7	124.4	30.4	-	-	-	-	-	-	-	-	-
Variance		(13.5)	(13.5)	(20.4)	1.1	5.8	-	-	-	-	-	-	-	-	-
Green River 5	2018	683.0	683.0	2.5	1.0	84.9	394.4	155.3	44.9	-	-	-	-	-	-
Green River 5	2021	816.5	816.5	3.6	2.0	0.3	0.4	2.9	97.2	496.1	169.6	44.5	-	-	-
Variance		(133.5)	(133.5)	(1.1)	(1.0)	84.6	394.0	152.4	(52.2)	(496.1)	(169.6)	(44.5)	-	-	-
Combined Cycle GT 2022	2025	913.1	856.6	2.5	-	-	-	-	-	-	-	4.8	135.1	502.6	211.5
Combined Cycle GT 2031	2031	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variance		913.1	856.6	2.5	-	-	-	-	-	-	-	4.8	135.1	502.6	211.5

1 Phase I	$148.1	
	$152.3	
	$ 21.5	
Total Phase I		$321.9 -> See attched 2015 Business Plan Capital Review Landfill Phase I of $322M
2 Phase II	$ 60.4	
3 Phase III/IV	$119.2	
Total Phase III/IV		$179.6 -> See attched 2015 Business Plan Capital Review Landfill Phases II-IV of $180M
TOTAL NET LANDFILL COST		$501.5 (Net of IMPA/IMEA 25% ownership)
TOTAL COST		$668.7 (Inclusive of IMPA/IMEA share)

Capital Review – Trimble County CCR

Accrual Basis, $Millions

Authority/ECR Comparison

	Total Projection	Current Authority	ECR Filing	Variance to Authority	Variance to ECR Filing
BAP/GSP	$28	$30	$25	$2	($3)
Landfill Phase I/Treatment & Transpor	$322	$76	$73	($246)	($249)
Landfill Phase II, III, & IV	$180	$0	$0	($180)	($180)
Holcim	$9	$9	$8	$0	($1)
Total	$539	$115	$106	($424)	($433)

Business Plan Comparison

	Pre-2014	2014	2015	2016	2017	2018	2019	Post 2019	Total
2014 BP									
BAP/GSP	$29	$0	$0	$0	$0	$0	$0	$0	$29
Landfill Phase I	$10	$2	$19	$28	$32	$8	$10	$2	$112
Treatment & Transport	$8	$1	$29	$86	$42	$0	$0	$0	$165
Landfill Phase II, III, Close & Cap	$0	$0	$0	$0	$0	$0	$0	$148	$148
Holcim	$9	$0	$0	$0	$0	$0	$0	$0	$9
Total 2014 BP	$57	$3	$48	$113	$74	$9	$10	$150	$463
2015 BP									
BAP/GSP	$28	$0	$0	$0	$0	$0	$0	$0	$28
Landfill Phase I	$12	$3	$5	$44	$38	$42	$1	$3	$148
Treatment & Transport	$7	$0	$20	$80	$44	$23	$0	$0	$174
Landfill Phase II, III, Close & Cap	$0	$0	$0	$0	$0	$0	$0	$180	$180
Holcim	$9	$0	$0	$0	$0	$0	$0	$0	$9
Total 2015 BP	$57	$3	$25	$124	$81	$65	$1	$183	$539
Variance to 2014 BP									
BAP/GSP	$0	$0	$0	$0	$0	$0	$0	$0	$0
Landfill Phase I	($2)	($1)	$14	($16)	($5)	($34)	$9	($1)	($36)
Treatment & Transport	$1	$1	$9	$6	($2)	($23)	$0	$0	($9)
Landfill Phase II, III, Close & Cap	$0	$0	$0	$0	$0	$0	$0	($31)	($31)
Holcim	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Variance to 2014 BP	($0)	($0)	$23	($10)	($7)	($57)	$9	($32)	($75)

Key Messages

- All numbers are net of IMPA/IMEA reimbursement.
- The increase over the ECR Filing is due to refined engineering on the Transport System, permit delays, new landfill layout, and project contingencies added.
- Permitting issues have delayed Phase I at least 2 years.

LG&E KU

PPL companies

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**					12/31/2014	12/31/2015	12/30/2016	12/31/2017	12/31/2018	12/31/2019	12/30/2020	12/31/2021	12/31/2022	12/31/2023	12/30/2024	12/31/2025	12/31/2026
3	Tons	1.17	**745,290**	745,290			Cubic Yards Per Year		600,000									
4	Cubic yards		**637,000**	637,000	Cumulative Cu Yd		Cumulative Cubic Yards -->			637,000	1,274,000	1,911,000	2,548,000	3,185,000	3,822,000	4,459,000	5,096,000	5,733,000
5	Gross Price per ton		$ **16.80**	Fee + transport barge to mine			Available CY in Mine		6,800,000	6,763,000	6,726,000	6,689,000	6,652,000	6,615,000	6,578,000	6,541,000	6,504,000	6,467,000
6	0.75% IMPA/IMEA		$ **12.60**	Net cost to KU/LGE														
7	Revenue Requirement																	
8	On-Load and Off-Load Barge Facilities								$26,317,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities					$0	$0	$0	$152,300,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant					$0	$0	$0	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation						$0	$0	$0	($4,827,500)	($9,655,000)	($14,482,500)	($19,310,000)	($24,137,500)	($28,965,000)	($33,792,500)	($38,620,000)	($43,447,500)
12	Less Deferred Tax Balance							$0	$0	($727,685)	($3,865,708)	($6,627,138)	($9,041,156)	($11,132,777)	($12,927,014)	($14,445,407)	($15,709,495)	($16,931,894)
13	Environmental Compliance Rate Base					$0	$0	$0	$178,617,500	$173,062,315	$165,096,792	$157,507,862	$150,266,344	$143,347,223	$136,725,486	$130,379,593	$124,288,005	$118,238,106
14	Return on Environmental Rate Base					10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR $130,957,808	$0	$0	$0	$17,861,750	$17,306,231	$16,509,679	$15,750,786	$15,026,634	$14,334,722	$13,672,549	$13,037,959	$12,428,800	$11,823,811
16																		
17	Barge Shipping Costs		$ 1.96	745,290						$1,460,768	$1,497,288	$1,534,720	$1,573,088	$1,612,415	$1,652,725	$1,694,043	$1,736,395	$1,779,804
18	Barge Facilities' Operating Costs				Inflation Assumption			$0	$0	$825,000	$845,625	$866,766	$888,435	$910,646	$933,412	$956,747	$980,666	$1,005,182
19	CCR to Storage Facility @		$ 17.10	per ton	2.50%					$12,744,459	$13,063,070	$13,389,647	$13,724,388	$14,067,498	$14,419,186	$14,779,665	$15,149,157	$15,527,886
20	Warsaw Land Lease									$200,000	$205,000	$210,125	$215,378	$220,763	$226,282	$231,939	$237,737	$243,681
21	Operating Expenses					$0	$0	$0	$0	$15,230,227	$15,610,983	$16,001,258	$16,401,289	$16,811,321	$17,231,604	$17,662,394	$18,103,954	$18,556,553
22	Annual Depreciation						$0	$0	$0	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
23	Annual Property Tax Expense						$0	$0	$0	$267,926	$260,685	$253,444	$246,203	$238,961	$231,720	$224,479	$217,238	$209,996
24	Total Operating E(m)				PVRR $286,772,275	$0	$0	$0	$0	$20,325,654	$20,699,168	$21,082,201	$21,474,992	$21,877,783	$22,290,824	$22,714,373	$23,148,692	$23,594,049
25	Total E(m) CCR to Sterling				**PVRR $417,730,083**	$0	$0	$0	$17,861,750	$37,631,885	$37,208,847	$36,832,988	$36,501,626	$36,212,505	$35,963,373	$35,752,332	$35,577,492	$35,417,860
26	**All-in Annual Cost per Cubic Yd**									**$59.08**	**$58.41**	**$57.82**	**$57.30**	**$56.85**	**$56.46**	**$56.13**	**$55.85**	**$55.60**
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR $464,429,366**	$0	$2,530,000	$14,947,950	$23,647,550	$48,033,216	$46,609,152	$45,153,465	$43,759,068	$42,421,921	$41,137,981	$39,903,786	$41,585,876	$43,072,231
28	**PVRR Comparative (savings) cost**				**6.70% ($46,699,283)**	$0	($2,530,000)	($14,947,950)	($5,785,900)	($10,401,331)	($9,400,305)	($8,320,477)	($7,257,442)	($6,209,416)	($5,174,608)	($4,151,454)	($6,008,384)	($7,654,371)
29																		
30	**Trimble CCR to On-Site Landfill**																	
31		Year 1	Year 2	Year 3	Year 4			$123,800,000	$81,300,000	$65,100,000								$0
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$25,300,000	$149,100,000	$230,400,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000						$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000
34	Phase III	$28,700,000	$26,200,000	$4,700,000						$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000						$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant					$0	$25,300,000	$149,100,000	$230,400,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$324,200,000	$350,400,000
38	Less Accumulated Depreciation							$0	$0	($13,431,818)	($26,863,636)	($40,295,455)	($53,727,273)	($67,159,091)	($80,590,909)	($94,022,727)	($107,454,545)	($120,886,364)
39	Less Deferred Tax Balance							$0	$0	$914,371	($2,158,856)	($4,609,057)	($6,484,510)	($7,826,598)	($8,676,702)	($9,070,456)	($9,043,495)	($8,947,565)
40	Environmental Compliance Rate Base					$0	$25,300,000	$149,100,000	$230,400,000	$282,982,553	$266,477,508	$250,595,489	$235,288,217	$220,514,311	$206,232,389	$192,406,817	$207,701,959	$220,566,072
41	Return on Environmental Rate Base					10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR $224,024,311	$0	$2,530,000	$14,910,000	$23,040,000	$28,298,255	$26,647,751	$25,059,549	$23,528,822	$22,051,431	$20,623,239	$19,240,682	$20,770,196	$22,056,607
43																		
44	Operating Expenses per cu yd		$ 12.47		Inflation													
45	Operating Expenses Net (75%)		$ 9.35	cu yd	2.50%				$384,000	$5,957,543	$6,106,481	$6,259,143	$6,415,622	$6,576,012	$6,740,413	$6,908,923	$7,081,646	$7,258,687
46	Annual Depreciation							$0	$0	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
47	Annual Property Tax Expense						$0	$37,950	$223,650	$345,600	$423,102	$402,955	$382,807	$362,659	$342,511	$322,364	$302,216	$325,118
48	Total Operating E(m)				PVRR $240,405,055	$0	$0	$37,950	$607,650	$19,734,961	$19,961,402	$20,093,916	$20,230,247	$20,370,489	$20,514,742	$20,663,105	$20,815,680	$21,015,623
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR $464,429,366**	$0	$2,530,000	$14,947,950	$23,647,650	$48,033,216	$46,609,152	$45,153,465	$43,759,068	$42,421,921	$41,137,981	$39,903,786	$41,585,876	$43,072,231
50	**All in Annual Cost per Cubic Yd**									**$75.41**	**$73.17**	**$70.88**	**$68.70**	**$66.60**	**$64.58**	**$62.64**	**$65.28**	**$67.62**

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**				12/31/2014	12/31/2015	12/30/2016	12/31/2017	12/31/2018	12/31/2019	12/30/2020	12/31/2021	12/31/2022	12/31/2023	12/30/2024	12/31/2025	12/31/2026
51	Assumed Cubic Yards	**637,000**	Yr b/w Dates	910,000			Cumulative Cubic Yards -->		637,000	1,274,000	1,911,000	2,548,000	3,185,000	3,822,000	4,459,000	5,096,000	5,733,000
52	Phase I Commence Date	1/1/2018	9	8,190,000													
53	Phase II In Service Date	1/1/2027	7	6,370,000					$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000
54	Phase III In Service Date	1/1/2034	11	10,010,000					$0	$0	$0	$0	$0	$0	$0	$0	$0
55	Phase IV In Service Date	1/1/2045	9	8,190,000					$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000													
57	Cummulative Cu Yd to begin Phase II			4,549,999													
58	Cumulative Cu Yd to begin Phase III			12,011,999													
59	Cumulative Cu Yd to begin Phase IV			23,932,999													
60		1 Depreciation Year							1	2	3	4	5	6	7	8	9
61	Sterling	Book Depreciation Years	37				$0		$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
62		Tax Depreciation (20yr MACRS unless life < 20yrs)	20				$0		$6,698,156	$12,894,397	$11,926,290	$11,033,203	$10,204,418	$9,439,935	$8,730,823	$8,077,083	$7,969,913
63		Difference					$0	$0	($1,870,656)	($8,066,897)	($7,098,790)	($6,205,703)	($5,376,918)	($4,612,435)	($3,903,323)	($3,249,583)	($3,142,413)
64		Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65		Deferred Tax					$0	$0	($727,685)	($3,138,023)	($2,761,429)	($2,414,018)	($2,091,621)	($1,794,237)	($1,518,393)	($1,264,088)	($1,222,399)
66		Accumulated Deferred Tax Balance					$0	$0	($727,685)	($3,865,708)	($6,627,138)	($9,041,156)	($11,132,777)	($12,927,014)	($14,445,407)	($15,709,495)	($16,931,894)
67		MACRS Tax Depreciation Rate							3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%
68																	
69		Depreciation Year							1	2	3	4	5	6	7	8	9
70	Phase 1	Book Depreciation Years	22				$0	$0	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
71		Tax Depreciation (20yr MACRS unless life < 20yrs)	20				$0	$0	$11,081,250	$21,332,145	$19,730,535	$18,253,035	$16,881,915	$15,617,175	$14,444,040	$13,362,510	$13,185,210
72		Difference					$0	$0	$2,350,568	($7,900,327)	($6,298,717)	($4,821,217)	($3,450,097)	($2,185,357)	($1,012,222)	$69,308	$246,608
73		Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74		Deferred Tax					$0	$0	$914,371	($3,073,227)	($2,450,201)	($1,875,453)	($1,342,088)	($850,104)	($393,754)	$26,961	$95,931
75		Accumulated Deferred Tax Balance					$0	$0	$914,371	($2,158,856)	($4,609,057)	($6,484,510)	($7,826,598)	($8,676,702)	($9,070,456)	($9,043,495)	($8,947,565)
76		MACRS Tax Depreciation Rate							3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%
77																	
78		Depreciation Year							0	0	0	0	0	0	0	0	0
79	Phase 2	Book Depreciation Years	22						$0	$0	$0	$0	$0	$0	$0	$0	$0
80		Tax Depreciation	20						$0	$0	$0	$0	$0	$0	$0	$0	$0
81		Difference							$0	$0	$0	$0	$0	$0	$0	$0	$0
82		Rate							38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83		Deferred Tax							$0	$0	$0	$0	$0	$0	$0	$0	$0
84		Accumulated Deferred Tax Balance							$0	$0	$0	$0	$0	$0	$0	$0	$0
85		MACRS Tax Depreciation Rate							0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
86																	
87		Depreciation Year							0	0	0	0	0	0	0	0	0
88	Phase 3	Book Depreciation Years	22						$0	$0	$0	$0	$0	$0	$0	$0	$0
89		Tax Depreciation (20yr MACRS unless life < 20yrs)	20						$0	$0	$0	$0	$0	$0	$0	$0	$0
90		Difference							$0	$0	$0	$0	$0	$0	$0	$0	$0
91		Rate							38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92		Deferred Tax							$0	$0	$0	$0	$0	$0	$0	$0	$0
93		Accumulated Deferred Tax Balance							$0	$0	$0	$0	$0	$0	$0	$0	$0
94		MACRS Tax Depreciation Rate							0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
95																	
96		Depreciation Year							0	0	0	0	0	0	0	0	0
97	Phase 4	Book Depreciation Years	22						$0	$0	$0	$0	$0	$0	$0	$0	$0
98		Tax Depreciation (20yr MACRS unless life < 20yrs)	20						$0	$0	$0	$0	$0	$0	$0	$0	$0
99		Difference							$0	$0	$0	$0	$0	$0	$0	$0	$0
100		Rate							38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101		Deferred Tax							$0	$0	$0	$0	$0	$0	$0	$0	$0
102		Accumulated Deferred Tax Balance							$0	$0	$0	$0	$0	$0	$0	$0	$0
103		MACRS Tax Depreciation Rate							0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA													
2	**Trimble CCR to Sterling Materials**					12/31/2027	12/30/2028	12/31/2029	12/30/2030	12/31/2031	12/30/2032	12/31/2033	12/31/2034	12/31/2035	12/30/2036	12/31/2037	12/31/2038
3	Tons	1.17	**745,290**	745,290													
4	Cubic yards		**637,000**	637,000	Cumulative Cu Yd	6,370,000	7,007,000	7,644,000	8,281,000	8,918,000	9,555,000	10,192,000	10,829,000	11,466,000	12,103,000	12,740,000	13,377,000
5	Gross Price per ton		$ **16.80**	Fee + transport barge to mine		6,430,000	6,393,000	6,356,000	6,319,000	6,282,000	6,245,000	6,208,000	6,171,000	6,134,000	6,097,000	6,060,000	6,023,000
6	0.75% IMPA/IMEA		$ **12.60**	Net cost to KU/LGE													
7	Revenue Requirement																
8	On-Load and Off-Load Barge Facilities					$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant					$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation					($48,275,000)	($53,102,500)	($57,930,000)	($62,757,500)	($67,585,000)	($72,412,500)	($77,240,000)	($82,067,500)	($86,895,000)	($91,722,500)	($96,550,000)	($101,377,500)
12	Less Deferred Tax Balance					($18,153,598)	($19,375,996)	($20,597,700)	($21,820,099)	($23,041,802)	($24,264,201)	($25,485,905)	($26,708,303)	($27,930,007)	($29,152,406)	($30,374,109)	($30,046,360)
13	Environmental Compliance Rate Base					$112,188,902	$106,139,004	$100,089,800	$94,039,901	$87,990,698	$81,940,799	$75,891,595	$69,841,697	$63,792,493	$57,742,594	$51,693,391	$47,193,640
14	Return on Environmental Rate Base					10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR $130,957,808	$11,218,890	$10,613,900	$10,008,980	$9,403,990	$8,799,070	$8,194,080	$7,589,160	$6,984,170	$6,379,249	$5,774,259	$5,169,339	$4,719,364
16																	
17	Barge Shipping Costs		$ 1.96	745,290		$1,824,300	$1,869,907	$1,916,655	$1,964,571	$2,013,685	$2,064,028	$2,115,628	$2,168,519	$2,222,732	$2,278,300	$2,335,258	$2,393,639
18	Barge Facilities' Operating Costs				Inflation Assumption	$1,030,312	$1,056,070	$1,082,471	$1,109,533	$1,137,272	$1,165,703	$1,194,846	$1,224,717	$1,255,335	$1,286,718	$1,318,886	$1,351,859
19	CCR to Storage Facility @		$ 17.10	per ton	2.50%	$15,916,083	$16,313,985	$16,721,835	$17,139,880	$17,568,377	$18,007,587	$18,457,777	$18,919,221	$19,392,202	$19,877,007	$20,373,932	$20,883,280
20	Warsaw Land Lease					$249,773	$256,017	$262,417	$268,978	$275,702	$282,595	$289,660	$296,901	$304,324	$311,932	$319,730	$327,723
21	Operating Expenses					$19,020,467	$19,495,979	$19,983,378	$20,482,963	$20,995,037	$21,519,913	$22,057,910	$22,609,358	$23,174,592	$23,753,957	$24,347,806	$24,956,501
22	Annual Depreciation					$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
23	Annual Property Tax Expense					$202,755	$195,514	$188,273	$181,031	$173,790	$166,549	$159,308	$152,066	$144,825	$137,584	$130,343	$123,101
24	Total Operating E(m)				PVRR $286,772,275	$24,050,722	$24,518,992	$24,999,151	$25,491,494	$25,996,327	$26,513,961	$27,044,718	$27,588,924	$28,146,917	$28,719,041	$29,305,648	$29,907,102
25	Total E(m) CCR to Sterling				**PVRR $417,730,083**	$35,269,612	$35,132,893	$35,008,131	$34,895,484	$34,795,396	$34,708,041	$34,633,877	$34,573,094	$34,526,166	$34,493,300	$34,474,987	$34,626,466
26	**All-in Annual Cost per Cubic Yd**					**$55.37**	**$55.15**	**$54.96**	**$54.78**	**$54.62**	**$54.49**	**$54.37**	**$54.27**	**$54.20**	**$54.15**	**$54.12**	**$54.36**
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR $464,429,366**	$44,993,097	$43,491,719	$41,999,461	$40,523,622	$39,063,704	$37,618,751	$36,188,389	$34,771,787	$33,362,105	$34,827,859	$36,092,420	$37,922,023
28	**PVRR Comparative (savings) cost**				**6.70% ($46,699,283)**	($9,723,485)	($8,358,826)	($6,991,331)	($5,628,138)	($4,268,308)	($2,910,710)	($1,554,512)	($198,693)	$1,164,061	($334,559)	($1,617,432)	($3,295,556)
29																	
30	Trimble CCR to On-Site Landfill																
31		Year 1	Year 2	Year 3	Year 4	$0	$0					$0					$0
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000		$5,600,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000	$4,700,000
35	Phase IV	$28,700,000	$26,200,000	$4,700,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments					$0	$0	$0	$0	$0	$0	$0		$0	$0	$0	$0
37	Revised Eligible Plant					$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$384,700,000	$410,900,000	$415,600,000
38	Less Accumulated Depreciation					($137,068,182)	($153,250,000)	($169,431,818)	($185,613,636)	($201,795,455)	($217,977,273)	($234,159,091)	($250,340,909)	($266,522,727)	($282,704,545)	($298,886,364)	($317,777,273)
39	Less Deferred Tax Balance					($8,663,278)	($9,196,553)	($9,601,122)	($9,889,167)	($10,066,863)	($10,144,981)	($10,128,517)	($10,027,067)	($9,910,346)	($9,794,539)	($9,677,819)	($6,813,067)
40	Environmental Compliance Rate Base					$210,268,540	$193,553,447	$176,967,060	$160,497,196	$144,137,682	$127,877,746	$111,712,392	$95,632,024	$79,566,927	$92,200,915	$102,335,818	$91,009,660
41	Return on Environmental Rate Base					10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR $224,024,311	$21,026,854	$19,355,345	$17,696,706	$16,049,720	$14,413,768	$12,787,775	$11,171,239	$9,563,202	$7,956,693	$9,220,092	$10,233,582	$9,100,966
43																	
44	Operating Expenses per cu yd		$ 12.47		Inflation												
45	Operating Expenses Net (75%)		$ 9.35	cu yd	2.50%	$7,440,154	$7,626,158	$7,816,812	$8,012,232	$8,212,538	$8,417,852	$8,628,298	$8,844,005	$9,065,105	$9,291,733	$9,524,026	$9,762,127
46	Annual Depreciation					$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$18,890,909
47	Annual Property Tax Expense					$344,270	$328,398	$304,125	$279,852	$255,580	$231,307	$207,034	$182,761	$158,489	$134,216	$152,993	$168,020
48	Total Operating E(m)				PVRR $240,405,055	$23,966,243	$24,136,374	$24,302,755	$24,473,903	$24,649,936	$24,830,977	$25,017,150	$25,208,585	$25,405,412	$25,607,767	$25,858,838	$28,821,057
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR $464,429,366**	$44,993,097	$43,491,719	$41,999,461	$40,523,622	$39,063,704	$37,618,751	$36,188,389	$34,771,787	$33,362,105	$34,827,859	$36,092,420	$37,922,023
50	**All in Annual Cost per Cubic Yd**					**$70.63**	**$68.28**	**$65.93**	**$63.62**	**$61.32**	**$59.06**	**$56.81**	**$54.59**	**$52.37**	**$54.67**	**$56.66**	**$59.53**

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**				12/31/2027	12/30/2028	12/31/2029	12/31/2030	12/31/2031	12/30/2032	12/31/2033	12/31/2034	12/31/2035	12/30/2036	12/31/2037	12/31/2038
51	Assumed Cubic Yards	637,000	Yr b/w Dates	910,000	6,370,000	7,007,000	7,644,000	8,281,000	8,918,000	9,555,000	10,192,000	10,829,000	11,466,000	12,103,000	12,740,000	13,377,000
52	Phase I Commence Date	1/1/2018	9	8,190,000												
53	**Phase II In Service Date**	1/1/2027	7	6,370,000	$5,600,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
54	Phase III In Service Date	1/1/2034	11	10,010,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000	$4,700,000
55	Phase IV In Service Date	1/1/2045	9	8,190,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000												
57	Cummulative Cu Yd to begin Phase II			4,549,999												
58	Cumulative Cu Yd to begin Phase III			12,011,999												
59	Cumulative Cu Yd to begin Phase IV			23,932,999												
60	1 Depreciation Year				10	11	12	13	14	15	16	17	18	19	20	21
61	Sterling Book Depreciation Years		37		$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
62	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$3,984,956
63	Difference				($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	$842,544
64	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax				($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	$327,749
66	Accumulated Deferred Tax Balance				($18,153,598)	($19,375,996)	($20,597,700)	($21,820,099)	($23,041,802)	($24,264,201)	($25,485,905)	($26,708,303)	($27,930,007)	($29,152,406)	($30,374,109)	($30,046,360)
67	MACRS Tax Depreciation Rate				4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%
68																
69	Depreciation Year				10	11	12	13	14	15	16	17	18	19	20	21
70	Phase 1 Book Depreciation Years		22		$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
71	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$6,592,605
72	Difference				$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$6,839,213
73	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax				$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$2,660,454
75	Accumulated Deferred Tax Balance				($8,850,485)	($8,754,554)	($8,657,474)	($8,561,543)	($8,464,463)	($8,368,533)	($8,271,453)	($8,175,522)	($8,078,442)	($7,982,511)	($7,885,431)	($5,224,977)
76	MACRS Tax Depreciation Rate				4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%
77																
78	Depreciation Year				1	2	3	4	5	6	7	8	9	10	11	12
79	Phase 2 Book Depreciation Years		22		$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000
80	Tax Depreciation		20		$2,268,750	$4,367,495	$4,039,585	$3,737,085	$3,456,365	$3,197,425	$2,957,240	$2,735,810	$2,699,510	$2,698,905	$2,699,510	$2,698,905
81	Difference				$481,250	($1,617,495)	($1,289,585)	($987,085)	($706,365)	($447,425)	($207,240)	$14,190	$50,490	$51,095	$50,490	$51,095
82	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax				$187,206	($629,206)	($501,649)	($383,976)	($274,776)	($174,048)	($80,616)	$5,520	$19,641	$19,876	$19,641	$19,876
84	Accumulated Deferred Tax Balance				$187,206	($441,999)	($943,648)	($1,327,624)	($1,602,400)	($1,776,448)	($1,857,065)	($1,851,545)	($1,831,904)	($1,812,028)	($1,792,388)	($1,772,512)
85	MACRS Tax Depreciation Rate				3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%	4.461%	4.462%	4.461%
86																
87	Depreciation Year				0	0	0	0	0	0	0	0	0	0	0	1
88	Phase 3 Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,709,091
89	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,235,000
90	Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$474,091
91	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$184,421
93	Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$184,421
94	MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	3.750%
95																
96	Depreciation Year				0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**						12/31/2039	12/30/2040	12/31/2041	12/31/2042	12/31/2043	12/30/2044	12/30/2045	12/30/2046	12/30/2047	12/29/2048	12/29/2049	12/29/2050
3	Tons	1.17	**745,290**	745,290															
4	Cubic yards		**637,000**	637,000	Cumulative Cu Yd		14,014,000	14,651,000	15,288,000	15,925,000	16,562,000	17,199,000	17,836,000	18,473,000	19,110,000	19,747,000	20,384,000	21,021,000
5	Gross Price per ton		$ **16.80**	Fee + transport barge to mine			5,986,000	5,949,000	5,912,000	5,875,000	5,838,000	5,801,000	5,764,000	5,727,000	5,690,000	5,653,000	5,616,000	5,579,000
6	0.75% IMPA/IMEA		$ **12.60**	Net cost to KU/LGE															
7	Revenue Requirement																		
8	On-Load and Off-Load Barge Facilities						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation						($106,205,000)	($111,032,500)	($115,860,000)	($120,687,500)	($125,515,000)	($130,342,500)	($135,170,000)	($139,997,500)	($144,825,000)	($149,652,500)	($154,480,000)	($159,307,500)
12	Less Deferred Tax Balance						($28,168,463)	($26,290,565)	($24,412,668)	($22,534,770)	($20,656,873)	($18,778,975)	($16,901,078)	($15,023,180)	($13,145,283)	($11,267,385)	($9,389,488)	($7,511,590)
13	Environmental Compliance Rate Base						$44,244,038	$41,294,435	$38,344,833	$35,395,230	$32,445,628	$29,496,025	$26,546,423	$23,596,820	$20,647,218	$17,697,615	$14,748,013	$11,798,410
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR	$130,957,808	$4,424,404	$4,129,444	$3,834,483	$3,539,523	$3,244,563	$2,949,603	$2,654,642	$2,359,682	$2,064,722	$1,769,762	$1,474,801	$1,179,841
16																			
17	Barge Shipping Costs		$ 1.96	745,290			$2,453,480	$2,514,817	$2,577,688	$2,642,130	$2,708,183	$2,775,888	$2,845,285	$2,916,417	$2,989,327	$3,064,060	$3,140,662	$3,219,178
18	Barge Facilities' Operating Costs				Inflation Assumption		$1,385,655	$1,420,296	$1,455,804	$1,492,199	$1,529,504	$1,567,741	$1,606,935	$1,647,108	$1,688,286	$1,730,493	$1,773,756	$1,818,099
19	CCR to Storage Facility @		$ 17.10	per ton	2.50%		$21,405,362	$21,940,496	$22,489,008	$23,051,234	$23,627,515	$24,218,202	$24,823,657	$25,444,249	$26,080,355	$26,732,364	$27,400,673	$28,085,690
20	Warsaw Land Lease						$335,916	$344,314	$352,922	$361,745	$370,789	$380,059	$389,560	$399,299	$409,281	$419,514	$430,001	$440,751
21	Operating Expenses						$25,580,414	$26,219,924	$26,875,422	$27,547,308	$28,235,990	$28,941,890	$29,665,437	$30,407,073	$31,167,250	$31,946,431	$32,745,092	$33,563,719
22	Annual Depreciation						$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
23	Annual Property Tax Expense						$115,860	$108,619	$101,378	$94,136	$86,895	$79,654	$72,413	$65,171	$57,930	$50,689	$43,448	$36,206
24	Total Operating E(m)				PVRR	$286,772,275	$30,523,774	$31,156,043	$31,804,299	$32,468,944	$33,150,385	$33,849,044	$34,565,350	$35,299,744	$36,052,680	$36,824,620	$37,616,039	$38,427,426
25	Total E(m) CCR to Sterling				**PVRR**	**$417,730,083**	$34,948,177	$35,285,486	$35,638,783	$36,008,467	$36,394,948	$36,798,646	$37,219,992	$37,659,426	$38,117,402	$38,594,381	$39,090,841	$39,607,267
26	**All-in Annual Cost per Cubic Yd**						**$54.86**	**$55.39**	**$55.95**	**$56.53**	**$57.13**	**$57.77**	**$58.43**	**$59.12**	**$59.84**	**$60.59**	**$61.37**	**$62.18**
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$464,429,366**	$36,718,176	$22,914,836	$22,581,284	$22,264,924	$21,965,033	$21,681,105	$21,412,542	$21,152,469	$20,952,154	$20,811,755	$18,097,024	$18,144,205
28	**PVRR Comparative (savings) cost**				**6.70%**	**($46,699,283)**	($1,769,998)	$12,370,651	$13,057,499	$13,743,543	$14,429,915	$15,117,541	$15,807,450	$16,506,957	$17,165,248	$17,782,626	$20,993,817	$21,463,061
29																			
30	Trimble CCR to On-Site Landfill																		
31		Year 1	Year 2	Year 3	Year 4		$0	$0	$0										
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant						$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000
38	Less Accumulated Depreciation						($336,668,182)	($342,127,273)	($347,586,364)	($353,045,455)	($358,504,545)	($363,963,636)	($369,422,727)	($374,881,818)	($380,340,909)	($385,800,000)	($388,509,091)	($391,218,182)
39	Less Deferred Tax Balance						($2,188,295)	($2,662,605)	($3,021,229)	($3,272,041)	($3,423,860)	($3,483,401)	($3,458,322)	($3,419,098)	($2,854,822)	($1,765,724)	($1,746,144)	($1,726,795)
40	Environmental Compliance Rate Base						$76,743,523	$70,810,122	$64,992,408	$59,282,504	$53,671,595	$48,152,963	$42,718,950	$37,299,084	$32,404,269	$28,034,276	$25,344,765	$22,655,023
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR	$224,024,311	$7,674,352	$7,081,012	$6,499,241	$5,928,250	$5,367,159	$4,815,296	$4,271,895	$3,729,908	$3,240,427	$2,803,428	$2,534,477	$2,265,502
43																			
44	Operating Expenses per cu yd		$ 12.47			Inflation													
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$10,006,180	$10,256,335	$10,512,743	$10,775,562	$11,044,951	$11,321,075	$11,604,101	$11,894,204	$12,191,559	$12,496,348	$12,808,757	$13,128,976
46	Annual Depreciation						$18,890,909	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$5,459,091	$2,709,091	$2,709,091
47	Annual Property Tax Expense						$146,734	$118,398	$110,209	$102,020	$93,832	$85,643	$77,455	$69,266	$61,077	$52,889	$44,700	$40,636
48	Total Operating E(m)				PVRR	$240,405,055	$29,043,823	$15,833,823	$16,082,043	$16,336,673	$16,597,873	$16,865,809	$17,140,647	$17,422,561	$17,711,727	$18,008,328	$15,562,548	$15,878,703
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$464,429,366**	$36,718,176	$22,914,836	$22,581,284	$22,264,924	$21,965,033	$21,681,105	$21,412,542	$21,152,469	$20,952,154	$20,811,755	$18,097,024	$18,144,205
50	**All in Annual Cost per Cubic Yd**						**$57.64**	**$35.97**	**$35.45**	**$34.95**	**$34.48**	**$34.04**	**$33.61**	**$33.21**	**$32.89**	**$32.67**	**$28.41**	**$28.48**

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**					12/31/2039	12/30/2040	12/31/2041	12/31/2042	12/31/2043	12/30/2044	12/30/2045	12/30/2046	12/30/2047	12/29/2048	12/29/2049	12/29/2050
51	Assumed Cubic Yards	637,000	Yr b/w Dates	910,000		14,014,000	14,651,000	15,288,000	15,925,000	16,562,000	17,199,000	17,836,000	18,473,000	19,110,000	19,747,000	20,384,000	21,021,000
52	Phase I Commence Date	1/1/2018	9	8,190,000													
53	Phase II In Service Date	1/1/2027	7	6,370,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
54	Phase III In Service Date	1/1/2034	11	10,010,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
55	Phase IV In Service Date	1/1/2045	9	8,190,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000													
57	Cummulative Cu Yd to begin Phase II			4,549,999													
58	Cumulative Cu Yd to begin Phase III			12,011,999													
59	Cumulative Cu Yd to begin Phase IV			23,932,999													
60		1 Depreciation Year				22	23	24	25	26	27	28	29	30	31	32	33
61	Sterling	Book Depreciation Years		37		$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
62		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
63		Difference				$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
64		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65		Deferred Tax				$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898
66		Accumulated Deferred Tax Balance				($28,168,463)	($26,290,565)	($24,412,668)	($22,534,770)	($20,656,873)	($18,778,975)	($16,901,078)	($15,023,180)	($13,145,283)	($11,267,385)	($9,389,488)	($7,511,590)
67		MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
68																	
69		Depreciation Year				22	23	24	25	26	27	28	29	30	31	32	33
70	Phase 1	Book Depreciation Years		22		$13,431,818	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
71		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
72		Difference				$13,431,818	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
73		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74		Deferred Tax				$5,224,977	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
75		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
76		MACRS Tax Depreciation Rate															
77																	
78		Depreciation Year				13	14	15	16	17	18	19	20	21	22	23	24
79	Phase 2	Book Depreciation Years		22		$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$0	$0
80		Tax Depreciation		20		$2,699,510	$2,698,905	$2,699,510	$2,698,905	$2,699,510	$2,698,905	$2,699,510	$2,698,905	$1,349,755	$0	$0	$0
81		Difference				$50,490	$51,095	$50,490	$51,095	$50,490	$51,095	$50,490	$51,095	$1,400,245	$2,750,000	$0	$0
82		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83		Deferred Tax				$19,641	$19,876	$19,641	$19,876	$19,641	$19,876	$19,641	$19,876	$544,695	$1,069,750	$0	$0
84		Accumulated Deferred Tax Balance				($1,752,871)	($1,732,995)	($1,713,354)	($1,693,478)	($1,673,838)	($1,653,962)	($1,634,321)	($1,614,445)	($1,069,750)	$0	$0	$0
85		MACRS Tax Depreciation Rate				4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%	0.000%	0.000%	0.000%
86																	
87		Depreciation Year				2	3	4	5	6	7	8	9	10	11	12	13
88	Phase 3	Book Depreciation Years		22		$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091
89		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$4,302,524	$3,979,492	$3,681,492	$3,404,948	$3,149,860	$2,913,248	$2,695,112	$2,659,352	$2,658,756	$2,659,352	$2,658,756	$2,659,352
90		Difference				($1,593,433)	($1,270,401)	($972,401)	($695,857)	($440,769)	($204,157)	$13,979	$49,739	$50,335	$49,739	$50,335	$49,739
91		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92		Deferred Tax				($619,845)	($494,186)	($378,264)	($270,688)	($171,459)	($79,417)	$5,438	$19,348	$19,580	$19,348	$19,580	$19,348
93		Accumulated Deferred Tax Balance				($435,424)	($929,610)	($1,307,874)	($1,578,563)	($1,750,022)	($1,829,439)	($1,824,001)	($1,804,653)	($1,785,072)	($1,765,724)	($1,746,144)	($1,726,795)
94		MACRS Tax Depreciation Rate				7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%	4.461%	4.462%	4.461%	4.462%
95																	
96		Depreciation Year				0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4	Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99		Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101		Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103		MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

									End of Life								
1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA													
2	**Trimble CCR to Sterling Materials**						12/29/2051	12/28/2052	12/28/2053	12/28/2054	12/28/2055	12/27/2056	12/27/2057	12/27/2058	12/27/2059	12/26/2060	12/26/2061	12/26/2062
3	Tons 1.17		**745,290**	745,290														
4	Cubic yards		**637,000**	637,000	Cumulative Cu Yd		21,658,000	22,295,000	22,932,000	23,569,000								
5	Gross Price per ton	$	**16.80**	Fee + transport barge to mine			5,542,000	5,505,000	5,468,000	5,431,000								
6	0.75% IMPA/IMEA	$	**12.60**	Net cost to KU/LGE														
7	Revenue Requirement																	
8	On-Load and Off-Load Barge Facilities						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation						($164,135,000)	($168,962,500)	($173,790,000)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)
12	Less Deferred Tax Balance						($5,633,693)	($3,755,795)	($1,877,898)	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
13	Environmental Compliance Rate Base						$8,848,808	$5,899,205	$2,949,603	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR	$130,957,808	$884,881	$589,921	$294,960	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
16																		
17	Barge Shipping Costs	$	1.96	745,290			$3,299,658	$3,382,149	$3,466,703	$3,553,371	$0	$0	$0	$0	$0	$0	$0	$0
18	Barge Facilities' Operating Costs				Inflation Assumption		$1,863,552	$1,910,141	$1,957,894	$2,006,842	$0							
19	CCR to Storage Facility @	$	17.10	per ton	2.50%		$28,787,832	$29,507,528	$30,245,216	$31,001,347	$0	$0	$0	$0	$0	$0	$0	$0
20	Warsaw Land Lease						$451,770	$463,064	$474,641	$486,507	$0	$0	$0	$0	$0	$0	$0	$0
21	Operating Expenses						$34,402,812	$35,262,883	$36,144,455	$37,048,066	$0	$0	$0	$0	$0	$0	$0	$0
22	Annual Depreciation						$4,827,500	$4,827,500	$4,827,500	$4,827,500	$0	$0	$0	$0	$0	$0	$0	$0
23	Annual Property Tax Expense						$28,965	$21,724	$14,483	$7,241	$0	$0	$0	$0	$0	$0	$0	$0
24	Total Operating E(m)				PVRR	$286,772,275	$39,259,277	$40,112,106	$40,986,437	$41,882,807	$0	$0	$0	$0	$0	$0	$0	$0
25	Total E(m) CCR to Sterling				**PVRR**	**$417,730,083**	$40,144,158	$40,702,027	$41,281,397	$41,882,807	($0)	($0)	$0	$0	$0	$0	$0	$0
26	**All-in Annual Cost per Cubic Yd**						**$63.02**	**$63.90**	**$64.81**	**$65.75**								
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$464,429,366**	$18,199,415	$18,262,807	$18,334,633	$18,415,057	$3,650,110	$3,377,072	$3,104,057	$2,882,744	$2,713,155	($0)	($0)	($0)
28	**PVRR Comparative (savings) cost**				**6.70%**	**($46,699,283)**	$21,944,743	$22,439,220	$22,946,764	$23,467,750	($3,650,110)	($3,377,072)	($3,104,057)	($2,882,744)	($2,713,155)	$0	$0	$0
29																		
30	Trimble CCR to On-Site Landfill																	
31		Year 1	Year 2	Year 3	Year 4							$0						
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant						$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000
38	Less Accumulated Depreciation						($393,927,273)	($396,636,364)	($399,345,455)	($402,054,545)	($404,763,636)	($407,472,727)	($410,181,818)	($412,890,909)	($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)
39	Less Deferred Tax Balance						($1,707,215)	($1,687,866)	($1,668,286)	($1,648,938)	($1,629,357)	($1,610,009)	($1,590,429)	($1,053,836)	$0	$0	$0	$0
40	Environmental Compliance Rate Base						$19,965,512	$17,275,770	$14,586,259	$11,896,517	$9,207,006	$6,517,264	$3,827,753	$1,655,255	($0)	($0)	($0)	($0)
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR	$224,024,311	$1,996,551	$1,727,577	$1,458,626	$1,189,652	$920,701	$651,726	$382,775	$165,525	($0)	($0)	($0)	($0)
43																		
44	Operating Expenses per cu yd	$	12.47			Inflation												
45	Operating Expenses Net (75%)	$	9.35	cu yd		2.50%	$13,457,200	$13,793,630	$14,138,471	$14,491,933			$0	$0	$0	$0	$0	$0
46	Annual Depreciation						$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$0	$0	$0
47	Annual Property Tax Expense						$36,573	$32,509	$28,445	$24,382	$20,318	$16,255	$12,191	$8,127	$4,064	($0)	($0)	($0)
48	Total Operating E(m)				PVRR	$240,405,055	$16,202,864	$16,535,230	$16,876,007	$17,225,405	$2,729,409	$2,725,345	$2,721,282	$2,717,218	$2,713,155	($0)	($0)	($0)
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$464,429,366**	$18,199,415	$18,262,807	$18,334,633	$18,415,057	$3,650,110	$3,377,072	$3,104,057	$2,882,744	$2,713,155	($0)	($0)	($0)
50	**All in Annual Cost per Cubic Yd**						**$28.57**	**$28.67**	**$28.78**	**$28.91**	**$5.73**	**$5.30**	**$4.87**	**$4.53**	**$4.26**	**($0.00)**	**($0.00)**	**($0.00)**

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA						End of Life									
2	**Trimble CCR to Sterling Materials**				12/29/2051	12/28/2052	12/28/2053	12/28/2054	12/28/2055	12/27/2056	12/27/2057	12/27/2058	12/27/2059	12/26/2060	12/26/2061	12/26/2062
51	Assumed Cubic Yards	637,000	Yr b/w Dates	910,000	21,658,000	22,295,000	22,932,000	23,569,000								
52	Phase I Commence Date	1/1/2018	9	8,190,000												
53	Phase II In Service Date	1/1/2027	7	6,370,000	$0	$0	$0	$0								
54	Phase III In Service Date	1/1/2034	11	10,010,000	$0	$0	$0	$0								
55	Phase IV In Service Date	1/1/2045	9	8,190,000	$0	$0	$0	$0								
56	End of 37 Years	1/1/2054	36	33,670,000												
57	Cummulative Cu Yd to begin Phase II			4,549,999												
58	Cumulative Cu Yd to begin Phase III			12,011,999												
59	Cumulative Cu Yd to begin Phase IV			23,932,999												
60	1 Depreciation Year				34	35	36	37	38	39	40	41	42	43	44	45
61	Sterling Book Depreciation Years			37	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$0	$0	$0	$0	$0	$0	$0	$0
62	Tax Depreciation (20yr MACRS unless life < 20yrs)			20	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
63	Difference				$4,827,500	$4,827,500	$4,827,500	$4,827,500	$0	$0	$0	$0	$0	$0	$0	$0
64	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax				$1,877,898	$1,877,898	$1,877,898	$1,877,898	$0	$0	$0	$0	$0	$0	$0	$0
66	Accumulated Deferred Tax Balance				($5,633,693)	($3,755,795)	($1,877,898)	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
67	MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	$0	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
68																
69	Depreciation Year				34	35	36	37	38	39	40	41	42	43	44	45
70	Phase 1 Book Depreciation Years			22	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
71	Tax Depreciation (20yr MACRS unless life < 20yrs)			20	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
72	Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
73	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
75	Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0		$0	$0	$0	$0
76	MACRS Tax Depreciation Rate															
77																
78	Depreciation Year				25	26	27	28	29	30	31	32	33	34	35	36
79	Phase 2 Book Depreciation Years			22	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
80	Tax Depreciation			20	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
81	Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
82	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
84	Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
85	MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
86																
87	Depreciation Year				14	15	16	17	18	19	20	21	22	23	24	25
88	Phase 3 Book Depreciation Years			22	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$0	$0	$0
89	Tax Depreciation (20yr MACRS unless life < 20yrs)			20	$2,658,756	$2,659,352	$2,658,756	$2,659,352	$2,658,756	$2,659,352	$2,658,756	$1,329,676	$0	$0	$0	$0
90	Difference				$50,335	$49,739	$50,335	$49,739	$50,335	$49,739	$50,335	$1,379,415	$2,709,091	$0	$0	$0
91	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax				$19,580	$19,348	$19,580	$19,348	$19,580	$19,348	$19,580	$536,592	$1,053,836	$0	$0	$0
93	Accumulated Deferred Tax Balance				($1,707,215)	($1,687,866)	($1,668,286)	($1,648,938)	($1,629,357)	($1,610,009)	($1,590,429)	($1,053,836)	$0	$0	$0	$0
94	MACRS Tax Depreciation Rate				4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%	0.000%	0.000%	0.000%	0.000%
95																
96	Depreciation Year				0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years			22	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)			20	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA											
2	**Trimble CCR to Sterling Materials**						12/26/2063	12/25/2064	12/25/2065	12/25/2066	12/25/2067	12/24/2068	12/24/2069	12/24/2070	Total
3	Tons	1.17	**745,290**	745,290											
4	Cubic yards		**637,000**	637,000	Cumulative Cu Yd										
5	Gross Price per ton		**$ 16.80**	Fee + transport barge to mine											
6	0.75% IMPA/IMEA		**$ 12.60**	Net cost to KU/LGE											
7	Revenue Requirement														
8	On-Load and Off-Load Barge Facilities						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	
10	Revised Eligible Plant						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	
11	Less Accumulated Depreciation						($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	
12	Less Deferred Tax Balance						$0	$0	$0	$0	$0	$0	$0	$0	
13	Environmental Compliance Rate Base						$0	$0	$0	$0	$0	$0	$0	$0	
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
15	Total Capital E(m)				PVRR	$130,957,808	$0	$0	$0	$0	$0	$0	$0	$0	$278,002,604
16															
17	Barge Shipping Costs		$ 1.96	745,290			$0	$0	$0	$0	$0	$0	$0	$0	
18	Barge Facilities' Operating Costs				Inflation Assumption										
19	CCR to Storage Facility @		$ 17.10	per ton	2.50%		$0	$0	$0	$0	$0	$0	$0	$0	
20	Warsaw Land Lease						$0	$0	$0	$0	$0	$0	$0	$0	
21	Operating Expenses						$0	$0	$0	$0	$0	$0	$0	$0	
22	Annual Depreciation						$0	$0	$0	$0	$0	$0	$0	$0	
23	Annual Property Tax Expense						$0	$0	$0	$0	$0	$0	$0	$0	
24	Total Operating E(m)				PVRR	$286,772,275	$0	$0	$0	$0	$0	$0	$0	$0	
25	Total E(m) CCR to Sterling				**PVRR**	**$417,730,083**	$0	$0	$0	$0	$0	$0	$0	$0	**$1,371,472,313**
26	**All-in Annual Cost per Cubic Yd**														
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$464,429,366**	($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	**$1,251,291,788**
28	**PVRR Comparative (savings) cost**				**6.70%**	**($46,699,283)**	$0	$0	$0	$0	$0	$0	$0	$0	**$120,180,526**
29															
30	Trimble CCR to On-Site Landfill														
31		Year 1	Year 2	Year 3	Year 4										
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	
37	Revised Eligible Plant						$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	
38	Less Accumulated Depreciation						($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)	($415,600,000)	
39	Less Deferred Tax Balance						$0	$0	$0	$0	$0	$0	$0	$0	
40	Environmental Compliance Rate Base						($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
42	Capital E(m)				PVRR	$224,024,311	($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	**$472,036,554**
43															
44	Operating Expenses per cu yd		$ 12.47			Inflation									
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$0	$0	$0	$0	$0	$0	$0	$0	
46	Annual Depreciation						$0	$0	$0	$0	$0	$0	$0	$0	**$415,600,000**
47	Annual Property Tax Expense						($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	
48	Total Operating E(m)				PVRR	$240,405,055	($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	**$779,255,234**
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$464,429,366**	($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	**$1,251,291,788**
50	**All in Annual Cost per Cubic Yd**						**($0.00)**	**($0.00)**	**($0.00)**	**($0.00)**	**($0.00)**	**($0.00)**	**($0.00)**	**($0.00)**	

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA												
2	**Trimble CCR to Sterling Materials**					12/26/2063	12/25/2064	12/25/2065	12/25/2066	12/25/2067	12/24/2068	12/24/2069	12/24/2070	Total
51	Assumed Cubic Yards	**637,000**	Yr b/w Dates	910,000										
52	Phase I Commence Date	1/1/2018	9	8,190,000										
53	Phase II In Service Date	1/1/2027	7	6,370,000										
54	Phase III In Service Date	1/1/2034	11	10,010,000										
55	Phase IV In Service Date	1/1/2045	9	8,190,000										
56	End of 37 Years	1/1/2054	36	33,670,000										
57	Cummulative Cu Yd to begin Phase II			4,549,999										
58	Cumulative Cu Yd to begin Phase III			12,011,999										
59	Cumulative Cu Yd to begin Phase IV			23,932,999										
60	1 Depreciation Year					46	47	48	49	50	51	52	53	
61	Sterling Book Depreciation Years			37		$0	$0	$0	$0	$0	$0	$0	$0	$178,617,500
62	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$178,617,500
63	Difference					$0	$0	$0	$0	$0	$0	$0	$0	
64	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
65	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	($0)
66	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	
67	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	
68														
69	Depreciation Year					46	47	48	49	50	51	52	53	
70	Phase 1 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$295,500,000
71	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$295,500,000
72	Difference					$0	$0	$0	$0	$0	$0	$0	$0	
73	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
74	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0
75	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	
76	MACRS Tax Depreciation Rate													
77														
78	Depreciation Year					37	38	39	40	41	42	43	44	
79	Phase 2 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$60,500,000
80	Tax Depreciation			20		$0	$0	$0	$0	$0	$0	$0	$0	$60,500,000
81	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0
82	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
83	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0
84	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	
85	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	
86														
87	Depreciation Year					26	27	28	29	30	31	32	33	
88	Phase 3 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$59,600,000
89	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$59,600,000
90	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0
91	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
92	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0
93	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	
94	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	
95														
96	Depreciation Year					0	0	0	0	0	0	0	0	
97	Phase 4 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference					$0	$0	$0	$0	$0	$0	$0	$0	
100	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
101	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	
102	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	
103	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**						12/31/2014	12/31/2015	12/30/2016	12/31/2017	12/31/2018	12/31/2019	12/30/2020	12/31/2021	12/31/2022	12/31/2023	12/30/2024	12/31/2025	12/31/2026
3	Tons	1.17	**487,550**	745,290			Cubic Yards Per Year			600,000									
4	Cubic yards		**416,709**	637,000	Cumulative Cu Yd		Cumulative Cubic Yards -->				416,709	833,418	1,250,127	1,666,836	2,083,545	2,500,254	2,916,963	3,333,672	3,750,381
5	Gross Price per ton		**$ 17.90**	Fee + transport barge to mine			Available CY in Mine			6,800,000	6,983,291	7,166,582	7,349,873	7,533,164	7,716,455	7,899,746	8,083,037	8,266,328	8,449,619
6	0.75% IMPA/IMEA		**$ 13.43**	Net cost to KU/LGE															
7	Revenue Requirement																		
8	On-Load and Off-Load Barge Facilities									$26,317,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities						$0	$0	$0	$152,300,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant						$0	$0	$0	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation							$0	$0	$0	($4,827,500)	($9,655,000)	($14,482,500)	($19,310,000)	($24,137,500)	($28,965,000)	($33,792,500)	($38,620,000)	($43,447,500)
12	Less Deferred Tax Balance								$0	$0	($727,685)	($3,865,708)	($6,627,138)	($9,041,156)	($11,132,777)	($12,927,014)	($14,445,407)	($15,709,495)	($16,931,894)
13	Environmental Compliance Rate Base						$0	$0	$0	$178,617,500	$173,062,315	$165,096,792	$157,507,862	$150,266,344	$143,347,223	$136,725,486	$130,379,593	$124,288,005	$118,238,106
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR	$130,957,808	$0	$0	$0	$17,861,750	$17,306,231	$16,509,679	$15,750,786	$15,026,634	$14,334,722	$13,672,549	$13,037,959	$12,428,800	$11,823,811
16																			
17	Barge Shipping Costs		$ 1.96	487,550							$955,597	$979,487	$1,003,974	$1,029,074	$1,054,800	$1,081,170	$1,108,200	$1,135,905	$1,164,302
18	Barge Facilities' Operating Costs					Inflation Assumption			$0	$0	$825,000	$845,625	$866,766	$888,435	$910,646	$933,412	$956,747	$980,666	$1,005,182
19	CCR to Storage Facility @		$ 17.93	per ton		2.50%					$8,739,325	$8,957,808	$9,181,754	$9,411,298	$9,646,580	$9,887,744	$10,134,938	$10,388,312	$10,648,019
20	Warsaw Land Lease										$200,000	$205,000	$210,125	$215,378	$220,763	$226,282	$231,939	$237,737	$243,681
21	Operating Expenses						$0	$0	$0	$0	$10,719,922	$10,987,920	$11,262,618	$11,544,184	$11,832,789	$12,128,608	$12,431,823	$12,742,619	$13,061,185
22	Annual Depreciation							$0	$0	$0	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
23	Annual Property Tax Expense							$0	$0	$0	$267,926	$260,685	$253,444	$246,203	$238,961	$231,720	$224,479	$217,238	$209,996
24	Total Operating E(m)				PVRR	$218,424,978	$0	$0	$0	$0	$15,815,349	$16,076,105	$16,343,562	$16,617,886	$16,899,250	$17,187,828	$17,483,802	$17,787,357	$18,098,681
25	Total E(m) CCR to Sterling				**PVRR**	**$349,382,786**	$0	$0	$0	$17,861,750	$33,121,580	$32,585,785	$32,094,348	$31,644,521	$31,233,972	$30,860,377	$30,521,761	$30,216,157	$29,922,491
26	**All-in Annual Cost per Cubic Yd**										**$79.48**	**$78.20**	**$77.02**	**$75.94**	**$74.95**	**$74.06**	**$73.24**	**$72.51**	**$71.81**
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$417,146,846**	$0	$2,530,000	$14,947,950	$23,647,650	$45,972,944	$44,497,374	$42,988,892	$41,540,381	$40,147,766	$38,806,973	$37,514,503	$36,266,860	$35,028,940
28	**PVRR Comparative (savings) cost**				**6.70%**	**($67,764,060)**	$0	($2,530,000)	($14,947,950)	($5,785,900)	($12,851,364)	($11,911,589)	($10,894,543)	($9,895,860)	($8,913,794)	($7,946,596)	($6,992,741)	($6,050,703)	($5,106,448)
29																			
30	**Trimble CCR to On-Site Landfill**																		
31		Year 1	Year 2	Year 3	Year 4				$123,800,000	$81,300,000	$65,100,000								$0
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000			$25,300,000	$149,100,000	$230,400,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000							$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000							$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000							$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant						$0	$25,300,000	$149,100,000	$230,400,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
38	Less Accumulated Depreciation								$0	$0	($13,431,818)	($26,863,636)	($40,295,455)	($53,727,273)	($67,159,091)	($80,590,909)	($94,022,727)	($107,454,545)	($120,886,364)
39	Less Deferred Tax Balance								$0	$0	$914,371	($2,158,856)	($4,609,057)	($6,484,510)	($7,826,598)	($8,676,702)	($9,070,456)	($9,043,495)	($8,947,565)
40	Environmental Compliance Rate Base						$0	$25,300,000	$149,100,000	$230,400,000	$282,982,553	$266,477,508	$250,595,489	$235,288,217	$220,514,311	$206,232,389	$192,406,817	$179,001,959	$165,666,072
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR	$214,434,534	$0	$2,530,000	$14,910,000	$23,040,000	$28,298,255	$26,647,751	$25,059,549	$23,528,822	$22,051,431	$20,623,239	$19,240,682	$17,900,196	$16,566,607
43																			
44	Operating Expenses per cu yd		$ 12.47			Inflation													
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%				$384,000	$3,897,271	$3,994,703	$4,094,570	$4,196,935	$4,301,858	$4,409,404	$4,519,639	$4,632,630	$4,748,446
46	Annual Depreciation								$0	$0	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
47	Annual Property Tax Expense							$0	$37,950	$223,650	$345,600	$423,102	$402,955	$382,807	$362,659	$342,511	$322,364	$302,216	$282,068
48	Total Operating E(m)				PVRR	$202,712,312	$0	$0	$37,950	$607,650	$17,674,689	$17,849,623	$17,929,343	$18,011,560	$18,096,335	$18,183,734	$18,273,821	$18,366,665	$18,462,333
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$417,146,846**	$0	$2,530,000	$14,947,950	$23,647,650	$45,972,944	$44,497,374	$42,988,892	$41,540,381	$40,147,766	$38,806,973	$37,514,503	$36,266,860	$35,028,940
50	**All in Annual Cost per Cubic Yd**										**$110.32**	**$106.78**	**$103.16**	**$99.69**	**$96.34**	**$93.13**	**$90.03**	**$87.03**	**$84.06**

1	**Revenue Requirments Summary - E(m)**	Net of IMPA/IMEA																	
2	**Trimble CCR to Sterling Materials**				12/31/2014	12/31/2015	12/30/2016	12/31/2017	12/31/2018	12/31/2019	12/30/2020	12/31/2021	12/31/2022	12/31/2023	12/30/2024	12/31/2025	12/31/2026
51	Assumed Cubic Yards	**416,709**	Yr b/w Dates	910,000			Cumulative Cubic Yards -->		416,709	833,418	1,250,127	1,666,836	2,083,545	2,500,254	2,916,963	3,333,672	3,750,381
52	Phase I Commence Date	1/1/2018	9	8,190,000													
53	Phase II In Service Date	1/1/2027	7	6,370,000					$0	$0	$0	$0	$0	$0	$0	$0	$0
54	Phase III In Service Date	1/1/2034	11	10,010,000					$0	$0	$0	$0	$0	$0	$0	$0	$0
55	Phase IV In Service Date	1/1/2045	9	8,190,000					$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000													
57	Cummulative Cu Yd to begin Phase II			4,549,999													
58	Cumulative Cu Yd to begin Phase III			12,893,163													
59	Cumulative Cu Yd to begin Phase IV			24,153,290													
60	1 Depreciation Year								1	2	3	4	5	6	7	8	9
61	Sterling Book Depreciation Years		37				$0		$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
62	Tax Depreciation (20yr MACRS unless life < 20yrs)		20				$0		$6,698,156	$12,894,397	$11,926,290	$11,033,203	$10,204,418	$9,439,935	$8,730,823	$8,077,083	$7,969,913
63	Difference						$0	$0	($1,870,656)	($8,066,897)	($7,098,790)	($6,205,703)	($5,376,918)	($4,612,435)	($3,903,323)	($3,249,583)	($3,142,413)
64	Rate						38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax						$0	$0	($727,685)	($3,138,023)	($2,761,429)	($2,414,018)	($2,091,621)	($1,794,237)	($1,518,393)	($1,264,088)	($1,222,399)
66	Accumulated Deferred Tax Balance						$0	$0	($727,685)	($3,865,708)	($6,627,138)	($9,041,156)	($11,132,777)	($12,927,014)	($14,445,407)	($15,709,495)	($16,931,894)
67	MACRS Tax Depreciation Rate								3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%
68																	
69	Depreciation Year								1	2	3	4	5	6	7	8	9
70	Phase 1 Book Depreciation Years		22				$0	$0	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
71	Tax Depreciation (20yr MACRS unless life < 20yrs)		20				$0	$0	$11,081,250	$21,332,145	$19,730,535	$18,253,035	$16,881,915	$15,617,175	$14,444,040	$13,362,510	$13,185,210
72	Difference						$0	$0	$2,350,568	($7,900,327)	($6,298,717)	($4,821,217)	($3,450,097)	($2,185,357)	($1,012,222)	$69,308	$246,608
73	Rate						38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax						$0	$0	$914,371	($3,073,227)	($2,450,201)	($1,875,453)	($1,342,088)	($850,104)	($393,754)	$26,961	$95,931
75	Accumulated Deferred Tax Balance						$0	$0	$914,371	($2,158,856)	($4,609,057)	($6,484,510)	($7,826,598)	($8,676,702)	($9,070,456)	($9,043,495)	($8,947,565)
76	MACRS Tax Depreciation Rate								3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%
77																	
78	Depreciation Year								0	0	0	0	0	0	0	0	0
79	Phase 2 Book Depreciation Years		22						$0	$0	$0	$0	$0	$0	$0	$0	$0
80	Tax Depreciation		20						$0	$0	$0	$0	$0	$0	$0	$0	$0
81	Difference								$0	$0	$0	$0	$0	$0	$0	$0	$0
82	Rate								38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax								$0	$0	$0	$0	$0	$0	$0	$0	$0
84	Accumulated Deferred Tax Balance								$0	$0	$0	$0	$0	$0	$0	$0	$0
85	MACRS Tax Depreciation Rate								0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
86																	
87	Depreciation Year								0	0	0	0	0	0	0	0	0
88	Phase 3 Book Depreciation Years		22						$0	$0	$0	$0	$0	$0	$0	$0	$0
89	Tax Depreciation (20yr MACRS unless life < 20yrs)		20						$0	$0	$0	$0	$0	$0	$0	$0	$0
90	Difference								$0	$0	$0	$0	$0	$0	$0	$0	$0
91	Rate								38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax								$0	$0	$0	$0	$0	$0	$0	$0	$0
93	Accumulated Deferred Tax Balance								$0	$0	$0	$0	$0	$0	$0	$0	$0
94	MACRS Tax Depreciation Rate								0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
95																	
96	Depreciation Year								0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years		22						$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)		20						$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference								$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate								38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax								$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance								$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate								0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA													
2	**Trimble CCR to Sterling Materials**					12/31/2027	12/30/2028	12/31/2029	12/30/2030	12/31/2031	12/30/2032	12/31/2033	12/31/2034	12/31/2035	12/30/2036	12/31/2037	12/31/2038
3	Tons 1.17		**487,550**	745,290													
4	Cubic yards		**416,709**	637,000	Cumulative Cu Yd	4,167,090	4,583,799	5,000,508	5,417,217	5,833,926	6,250,635	6,667,344	7,084,053	7,500,762	7,917,471	8,334,180	8,750,889
5	Gross Price per ton	**$**	**17.90**	Fee + transport barge to mine		8,632,910	8,816,201	8,999,492	9,182,783	9,366,074	9,549,365	9,732,656	9,915,947	10,099,238	10,282,529	10,465,820	10,649,111
6	0.75% IMPA/IMEA	**$**	**13.43**	Net cost to KU/LGE													
7	Revenue Requirement																
8	On-Load and Off-Load Barge Facilities					$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant					$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation					($48,275,000)	($53,102,500)	($57,930,000)	($62,757,500)	($67,585,000)	($72,412,500)	($77,240,000)	($82,067,500)	($86,895,000)	($91,722,500)	($96,550,000)	($101,377,500)
12	Less Deferred Tax Balance					($18,153,598)	($19,375,996)	($20,597,700)	($21,820,099)	($23,041,802)	($24,264,201)	($25,485,905)	($26,708,303)	($27,930,007)	($29,152,406)	($30,374,109)	($30,046,360)
13	Environmental Compliance Rate Base					$112,188,902	$106,139,004	$100,089,800	$94,039,901	$87,990,698	$81,940,799	$75,891,595	$69,841,697	$63,792,493	$57,742,594	$51,693,391	$47,193,640
14	Return on Environmental Rate Base					10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR $130,957,808	$11,218,890	$10,613,900	$10,008,980	$9,403,990	$8,799,070	$8,194,080	$7,589,160	$6,984,170	$6,379,249	$5,774,259	$5,169,339	$4,719,364
16																	
17	Barge Shipping Costs	$	1.96	487,550		$1,193,410	$1,223,245	$1,253,826	$1,285,172	$1,317,301	$1,350,234	$1,383,989	$1,418,589	$1,454,054	$1,490,405	$1,527,665	$1,565,857
18	Barge Facilities' Operating Costs				Inflation Assumption	$1,030,312	$1,056,070	$1,082,471	$1,109,533	$1,137,272	$1,165,703	$1,194,846	$1,224,717	$1,255,335	$1,286,718	$1,318,886	$1,351,859
19	CCR to Storage Facility @	$	17.93	per ton	2.50%	$10,914,220	$11,187,075	$11,466,752	$11,753,421	$12,047,256	$12,348,438	$12,657,149	$12,973,578	$13,297,917	$13,630,365	$13,971,124	$14,320,402
20	Warsaw Land Lease					$249,773	$256,017	$262,417	$268,978	$275,702	$282,595	$289,660	$296,901	$304,324	$311,932	$319,730	$327,723
21	Operating Expenses					$13,387,714	$13,722,407	$14,065,467	$14,417,104	$14,777,531	$15,146,970	$15,525,644	$15,913,785	$16,311,630	$16,719,420	$17,137,406	$17,565,841
22	Annual Depreciation					$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
23	Annual Property Tax Expense					$202,755	$195,514	$188,273	$181,031	$173,790	$166,549	$159,308	$152,066	$144,825	$137,584	$130,343	$123,101
24	Total Operating E(m)				PVRR $218,424,978	$18,417,969	$18,745,421	$19,081,240	$19,425,635	$19,778,821	$20,141,018	$20,512,451	$20,893,351	$21,283,955	$21,684,504	$22,095,248	$22,516,442
25	Total E(m) CCR to Sterling				**PVRR $349,382,786**	$29,636,859	$29,359,321	$29,090,220	$28,829,625	$28,577,891	$28,335,098	$28,101,611	$27,877,521	$27,663,204	$27,458,764	$27,264,587	$27,235,806
26	**All-in Annual Cost per Cubic Yd**					**$71.12**	**$70.46**	**$69.81**	**$69.18**	**$68.58**	**$68.00**	**$67.44**	**$66.90**	**$66.38**	**$65.89**	**$65.43**	**$65.36**
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR $417,146,846**	$33,794,029	$35,431,972	$36,866,121	$38,733,244	$37,177,012	$35,628,296	$34,094,821	$32,575,592	$31,070,079	$29,577,410	$28,097,175	$26,878,490
28	**PVRR Comparative (savings) cost**				**6.70% ($67,764,060)**	($4,157,170)	($6,072,651)	($7,775,901)	($9,903,619)	($8,599,121)	($7,293,198)	($5,993,210)	($4,698,071)	($3,406,875)	($2,118,646)	($832,588)	$357,317
29																	
30	Trimble CCR to On-Site Landfill																
31		Year 1	Year 2	Year 3	Year 4	$0	$0					$0					$0
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000		$0	$28,700,000	$26,200,000	$5,600,000	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments					$0	$0	$0	$0	$0	$0	$0		$0	$0	$0	$0
37	Revised Eligible Plant					$295,500,000	$324,200,000	$350,400,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000
38	Less Accumulated Depreciation					($134,318,182)	($147,750,000)	($161,181,818)	($177,363,636)	($193,545,455)	($209,727,273)	($225,909,091)	($242,090,909)	($258,272,727)	($274,454,545)	($290,636,364)	($306,818,182)
39	Less Deferred Tax Balance					($8,850,485)	($8,754,554)	($8,657,474)	($8,374,337)	($8,906,462)	($9,312,180)	($9,599,076)	($9,777,922)	($9,854,890)	($9,839,576)	($9,736,976)	($7,056,881)
40	Environmental Compliance Rate Base					$152,331,334	$167,695,446	$180,560,708	$170,262,027	$153,548,083	$136,960,547	$120,491,833	$104,131,169	$87,872,383	$71,705,879	$55,626,660	$42,124,937
41	Return on Environmental Rate Base					10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR $214,434,534	$15,233,133	$16,769,545	$18,056,071	$17,026,203	$15,354,808	$13,696,055	$12,049,183	$10,413,117	$8,787,238	$7,170,588	$5,562,666	$4,212,494
43																	
44	Operating Expenses per cu yd	$	12.47		Inflation												
45	Operating Expenses Net (75%)	$	9.35	cu yd	2.50%	$4,867,157	$4,988,836	$5,113,557	$5,241,396	$5,372,431	$5,506,742	$5,644,410	$5,785,521	$5,930,159	$6,078,413	$6,230,373	$6,386,132
46	Annual Depreciation					$13,431,818	$13,431,818	$13,431,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818	$16,181,818
47	Annual Property Tax Expense					$261,920	$241,773	$264,675	$283,827	$267,955	$243,682	$219,409	$195,136	$170,864	$146,591	$122,318	$98,045
48	Total Operating E(m)				PVRR $202,712,312	$18,560,896	$18,662,427	$18,810,050	$21,707,042	$21,822,204	$21,932,242	$22,045,638	$22,162,475	$22,282,840	$22,406,822	$22,534,509	$22,665,996
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR $417,146,846**	$33,794,029	$35,431,972	$36,866,121	$38,733,244	$37,177,012	$35,628,296	$34,094,821	$32,575,592	$31,070,079	$29,577,410	$28,097,175	$26,878,490
50	**All in Annual Cost per Cubic Yd**					**$81.10**	**$85.03**	**$88.47**	**$92.95**	**$89.22**	**$85.50**	**$81.82**	**$78.17**	**$74.56**	**$70.98**	**$67.43**	**$64.50**

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**				12/31/2027	12/30/2028	12/31/2029	12/31/2030	12/31/2031	12/30/2032	12/31/2033	12/31/2034	12/31/2035	12/30/2036	12/31/2037	12/31/2038
51	Assumed Cubic Yards	**416,709**	Yr b/w Dates	910,000	4,167,090	4,583,799	5,000,508	5,417,217	5,833,926	6,250,635	6,667,344	7,084,053	7,500,762	7,917,471	8,334,180	8,750,889
52	Phase I Commence Date	1/1/2018	9	8,190,000												
53	Phase II In Service Date	1/1/2027	7	6,370,000	$0	$28,700,000	$26,200,000	$5,600,000	$0	$0	$0	$0	$0	$0	$0	$0
54	Phase III In Service Date	1/1/2034	11	10,010,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
55	Phase IV In Service Date	1/1/2045	9	8,190,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000												
57	Cummulative Cu Yd to begin Phase II			4,549,999												
58	Cumulative Cu Yd to begin Phase III			12,893,163												
59	Cumulative Cu Yd to begin Phase IV			24,153,290												
60	1 Depreciation Year				10	11	12	13	14	15	16	17	18	19	20	21
61	Sterling Book Depreciation Years		37		$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
62	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$3,984,956
63	Difference				($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	$842,544
64	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax				($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	$327,749
66	Accumulated Deferred Tax Balance				($18,153,598)	($19,375,996)	($20,597,700)	($21,820,099)	($23,041,802)	($24,264,201)	($25,485,905)	($26,708,303)	($27,930,007)	($29,152,406)	($30,374,109)	($30,046,360)
67	MACRS Tax Depreciation Rate				4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%
68																
69	Depreciation Year				10	11	12	13	14	15	16	17	18	19	20	21
70	Phase 1 Book Depreciation Years		22		$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
71	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$6,592,605
72	Difference				$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$6,839,213
73	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax				$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$2,660,454
75	Accumulated Deferred Tax Balance				($8,850,485)	($8,754,554)	($8,657,474)	($8,561,543)	($8,464,463)	($8,368,533)	($8,271,453)	($8,175,522)	($8,078,442)	($7,982,511)	($7,885,431)	($5,224,977)
76	MACRS Tax Depreciation Rate				4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%
77																
78	Depreciation Year				0	0	0	1	2	3	4	5	6	7	8	9
79	Phase 2 Book Depreciation Years		22		$0	$0	$0	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000
80	Tax Depreciation		20		$0	$0	$0	$2,268,750	$4,367,495	$4,039,585	$3,737,085	$3,456,365	$3,197,425	$2,957,240	$2,735,810	$2,699,510
81	Difference				$0	$0	$0	$481,250	($1,617,495)	($1,289,585)	($987,085)	($706,365)	($447,425)	($207,240)	$14,190	$50,490
82	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax				$0	$0	$0	$187,206	($629,206)	($501,649)	($383,976)	($274,776)	($174,048)	($80,616)	$5,520	$19,641
84	Accumulated Deferred Tax Balance				$0	$0	$0	$187,206	($441,999)	($943,648)	($1,327,624)	($1,602,400)	($1,776,448)	($1,857,065)	($1,851,545)	($1,831,904)
85	MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%
86																
87	Depreciation Year				0	0	0	0	0	0	0	0	0	0	0	0
88	Phase 3 Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
89	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
90	Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
91	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
93	Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
94	MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
95																
96	Depreciation Year				0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA														
2	**Trimble CCR to Sterling Materials**						12/31/2039	12/30/2040	12/31/2041	12/31/2042	12/31/2043	12/30/2044	12/30/2045	12/30/2046	12/30/2047	12/29/2048	12/29/2049	12/29/2050
3	Tons	1.17	**487,550**	745,290														
4	Cubic yards		**416,709**	637,000	Cumulative Cu Yd		9,167,598	9,584,307	10,001,016	10,417,725	10,834,434	11,251,143	11,667,852	12,084,561	12,501,270	12,917,979	13,334,688	13,751,397
5	Gross Price per ton		**$ 17.90**	Fee + transport barge to mine			10,832,402	11,015,693	11,198,984	11,382,275	11,565,566	11,748,857	11,932,148	12,115,439	12,298,730	12,482,021	12,665,312	12,848,603
6	0.75% IMPA/IMEA		**$ 13.43**	Net cost to KU/LGE														
7	Revenue Requirement																	
8	On-Load and Off-Load Barge Facilities						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation						($106,205,000)	($111,032,500)	($115,860,000)	($120,687,500)	($125,515,000)	($130,342,500)	($135,170,000)	($139,997,500)	($144,825,000)	($149,652,500)	($154,480,000)	($159,307,500)
12	Less Deferred Tax Balance						($28,168,463)	($26,290,565)	($24,412,668)	($22,534,770)	($20,656,873)	($18,778,975)	($16,901,078)	($15,023,180)	($13,145,283)	($11,267,385)	($9,389,488)	($7,511,590)
13	Environmental Compliance Rate Base						$44,244,038	$41,294,435	$38,344,833	$35,395,230	$32,445,628	$29,496,025	$26,546,423	$23,596,820	$20,647,218	$17,697,615	$14,748,013	$11,798,410
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR	$130,957,808	$4,424,404	$4,129,444	$3,834,483	$3,539,523	$3,244,563	$2,949,603	$2,654,642	$2,359,682	$2,064,722	$1,769,762	$1,474,801	$1,179,841
16																		
17	Barge Shipping Costs		$ 1.96	487,550			$1,605,004	$1,645,129	$1,686,257	$1,728,413	$1,771,624	$1,815,914	$1,861,312	$1,907,845	$1,955,541	$2,004,429	$2,054,540	$2,105,904
18	Barge Facilities' Operating Costs				Inflation Assumption		$1,385,655	$1,420,296	$1,455,804	$1,492,199	$1,529,504	$1,567,741	$1,606,935	$1,647,108	$1,688,286	$1,730,493	$1,773,756	$1,818,099
19	CCR to Storage Facility @		$ 17.93	per ton	2.50%		$14,678,412	$15,045,373	$15,421,507	$15,807,044	$16,202,221	$16,607,276	$17,022,458	$17,448,019	$17,884,220	$18,331,325	$18,789,609	$19,259,349
20	Warsaw Land Lease						$335,916	$344,314	$352,922	$361,745	$370,789	$380,059	$389,560	$399,299	$409,281	$419,514	$430,001	$440,751
21	Operating Expenses						$18,004,987	$18,455,112	$18,916,490	$19,389,402	$19,874,137	$20,370,990	$20,880,265	$21,402,272	$21,937,328	$22,485,762	$23,047,906	$23,624,103
22	Annual Depreciation						$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
23	Annual Property Tax Expense						$115,860	$108,619	$101,378	$94,136	$86,895	$79,654	$72,413	$65,171	$57,930	$50,689	$43,448	$36,206
24	Total Operating E(m)				PVRR	$218,424,978	$22,948,347	$23,391,231	$23,845,367	$24,311,038	$24,788,532	$25,278,144	$25,780,178	$26,294,943	$26,822,758	$27,363,950	$27,918,853	$28,487,810
25	Total E(m) CCR to Sterling				**PVRR**	**$349,382,786**	$27,372,751	$27,520,674	$27,679,850	$27,850,561	$28,033,095	$28,227,747	$28,434,820	$28,654,625	$28,887,480	$29,133,712	$29,393,654	$29,667,651
26	**All-in Annual Cost per Cubic Yd**						**$65.69**	**$66.04**	**$66.42**	**$66.83**	**$67.27**	**$67.74**	**$68.24**	**$68.76**	**$69.32**	**$69.91**	**$70.54**	**$71.20**
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$417,146,846**	$25,920,174	$12,354,691	$12,245,290	$12,140,058	$12,039,148	$11,942,620	$11,850,632	$11,763,248	$11,680,633	$14,472,857	$17,063,139	$20,013,887
28	**PVRR Comparative (savings) cost**				**6.70%**	**($67,764,060)**	$1,452,577	$15,165,983	$15,434,561	$15,710,503	$15,993,947	$16,285,126	$16,584,188	$16,891,377	$17,206,847	$14,660,855	$12,330,515	$9,653,764
29																		
30	Trimble CCR to On-Site Landfill																	
31		Year 1	Year 2	Year 3	Year 4		$0	$0	$0									
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000	$4,700,000
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant						$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$384,700,000	$410,900,000	$415,600,000
38	Less Accumulated Depreciation						($323,000,000)	($325,750,000)	($328,500,000)	($331,250,000)	($334,000,000)	($336,750,000)	($339,500,000)	($342,250,000)	($345,000,000)	($347,750,000)	($350,500,000)	($355,959,091)
39	Less Deferred Tax Balance						($1,812,028)	($1,792,388)	($1,772,512)	($1,752,871)	($1,732,995)	($1,713,354)	($1,693,478)	($1,673,838)	($1,653,962)	($1,634,321)	($1,614,445)	($885,329)
40	Environmental Compliance Rate Base						$31,187,972	$28,457,612	$25,727,488	$22,997,129	$20,267,005	$17,536,646	$14,806,522	$12,076,162	$9,346,038	$35,315,679	$58,785,555	$58,755,580
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR	$214,434,534	$3,118,797	$2,845,761	$2,572,749	$2,299,713	$2,026,700	$1,753,665	$1,480,652	$1,207,616	$934,604	$3,531,568	$5,878,555	$5,875,558
43																		
44	Operating Expenses per cu yd		$ 12.47			Inflation												
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$6,545,786	$6,709,430	$6,877,166	$7,049,095	$7,225,322	$7,405,955	$7,591,104	$7,780,882	$7,975,404	$8,174,789	$8,379,159	$8,588,638
46	Annual Depreciation						$16,181,818	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$5,459,091
47	Annual Property Tax Expense						$73,773	$49,500	$45,375	$41,250	$37,125	$33,000	$28,875	$24,750	$20,625	$16,500	$55,425	$90,600
48	Total Operating E(m)				PVRR	$202,712,312	$22,801,376	$9,508,930	$9,672,541	$9,840,345	$10,012,447	$10,188,955	$10,369,979	$10,555,632	$10,746,029	$10,941,289	$11,184,584	$14,138,329
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$417,146,846**	$25,920,174	$12,354,691	$12,245,290	$12,140,058	$12,039,148	$11,942,620	$11,850,632	$11,763,248	$11,680,633	$14,472,857	$17,063,139	$20,013,887
50	**All in Annual Cost per Cubic Yd**						**$62.20**	**$29.65**	**$29.39**	**$29.13**	**$28.89**	**$28.66**	**$28.44**	**$28.23**	**$28.03**	**$34.73**	**$40.95**	**$48.03**

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**					12/31/2039	12/30/2040	12/31/2041	12/31/2042	12/31/2043	12/30/2044	12/30/2045	12/30/2046	12/30/2047	12/29/2048	12/29/2049	12/29/2050
51	Assumed Cubic Yards	**416,709**	Yr b/w Dates	910,000		9,167,598	9,584,307	10,001,016	10,417,725	10,834,434	11,251,143	11,667,852	12,084,561	12,501,270	12,917,979	13,334,688	13,751,397
52	Phase I Commence Date	1/1/2018	9	8,190,000													
53	Phase II In Service Date	1/1/2027	7	6,370,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
54	Phase III In Service Date	1/1/2034	11	10,010,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000	$4,700,000
55	Phase IV In Service Date	1/1/2045	9	8,190,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000													
57	Cummulative Cu Yd to begin Phase II			4,549,999													
58	Cumulative Cu Yd to begin Phase III			12,893,163													
59	Cumulative Cu Yd to begin Phase IV			24,153,290													
60		1 Depreciation Year				22	23	24	25	26	27	28	29	30	31	32	33
61	Sterling	Book Depreciation Years		37		$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
62		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
63		Difference				$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
64		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65		Deferred Tax				$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898
66		Accumulated Deferred Tax Balance				($28,168,463)	($26,290,565)	($24,412,668)	($22,534,770)	($20,656,873)	($18,778,975)	($16,901,078)	($15,023,180)	($13,145,283)	($11,267,385)	($9,389,488)	($7,511,590)
67		MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
68																	
69		Depreciation Year				22	23	24	25	26	27	28	29	30	31	32	33
70	Phase 1	Book Depreciation Years		22		$13,431,818	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
71		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
72		Difference				$13,431,818	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
73		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74		Deferred Tax				$5,224,977	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
75		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
76		MACRS Tax Depreciation Rate															
77																	
78		Depreciation Year				10	11	12	13	14	15	16	17	18	19	20	21
79	Phase 2	Book Depreciation Years		22		$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000
80		Tax Depreciation		20		$2,698,905	$2,699,510	$2,698,905	$2,699,510	$2,698,905	$2,699,510	$2,698,905	$2,699,510	$2,698,905	$2,699,510	$2,698,905	$1,349,755
81		Difference				$51,095	$50,490	$51,095	$50,490	$51,095	$50,490	$51,095	$50,490	$51,095	$50,490	$51,095	$1,400,245
82		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83		Deferred Tax				$19,876	$19,641	$19,876	$19,641	$19,876	$19,641	$19,876	$19,641	$19,876	$19,641	$19,876	$544,695
84		Accumulated Deferred Tax Balance				($1,812,028)	($1,792,388)	($1,772,512)	($1,752,871)	($1,732,995)	($1,713,354)	($1,693,478)	($1,673,838)	($1,653,962)	($1,634,321)	($1,614,445)	($1,069,750)
85		MACRS Tax Depreciation Rate				4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%
86																	
87		Depreciation Year				0	0	0	0	0	0	0	0	0	0	0	1
88	Phase 3	Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,709,091
89		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,235,000
90		Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$474,091
91		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92		Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$184,421
93		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$184,421
94		MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	3.750%
95																	
96		Depreciation Year				0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4	Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98		Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99		Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100		Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101		Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102		Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103		MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA					End of Life									
2	**Trimble CCR to Sterling Materials**						12/29/2051	12/28/2052	12/28/2053	12/28/2054	12/28/2055	12/27/2056	12/27/2057	12/27/2058	12/27/2059	12/26/2060	12/26/2061	12/26/2062
3	Tons	1.17	**487,550**	745,290														
4	Cubic yards		**416,709**	637,000	Cumulative Cu Yd		14,168,106	14,584,815	15,001,524	15,418,233								
5	Gross Price per ton		$ **17.90**	Fee + transport barge to mine			13,031,894	13,215,185	13,398,476	13,581,767								
6	0.75% IMPA/IMEA		$ **13.43**	Net cost to KU/LGE														
7	Revenue Requirement																	
8	On-Load and Off-Load Barge Facilities						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation						($164,135,000)	($168,962,500)	($173,790,000)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)
12	Less Deferred Tax Balance						($5,633,693)	($3,755,795)	($1,877,898)	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
13	Environmental Compliance Rate Base						$8,848,808	$5,899,205	$2,949,603	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR	$130,957,808	$884,881	$589,921	$294,960	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
16																		
17	Barge Shipping Costs		$ 1.96	487,550			$2,158,551	$2,212,515	$2,267,828	$2,324,524	$0	$0	$0	$0	$0	$0	$0	$0
18	Barge Facilities' Operating Costs					Inflation Assumption	$1,863,552	$1,910,141	$1,957,894	$2,006,842	$0							
19	CCR to Storage Facility @		$ 17.93	per ton		2.50%	$19,740,833	$20,234,353	$20,740,212	$21,258,717	$0	$0	$0	$0	$0	$0	$0	$0
20	Warsaw Land Lease						$451,770	$463,064	$474,641	$486,507	$0	$0	$0	$0	$0	$0	$0	$0
21	Operating Expenses						$24,214,706	$24,820,074	$25,440,575	$26,076,590	$0	$0	$0	$0	$0	$0	$0	$0
22	Annual Depreciation						$4,827,500	$4,827,500	$4,827,500	$4,827,500	$0	$0	$0	$0	$0	$0	$0	$0
23	Annual Property Tax Expense						$28,965	$21,724	$14,483	$7,241	$0	$0	$0	$0	$0	$0	$0	$0
24	Total Operating E(m)				PVRR	$218,424,978	$29,071,171	$29,669,297	$30,282,558	$30,911,331	$0	$0	$0	$0	$0	$0	$0	$0
25	Total E(m) CCR to Sterling				**PVRR**	**$349,382,786**	$29,956,052	$30,259,218	$30,577,518	$30,911,331	($0)	($0)	$0	$0	$0	$0	$0	$0
26	**All-in Annual Cost per Cubic Yd**						**$71.89**	**$72.61**	**$73.38**	**$74.18**								
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$417,146,846**	$19,726,545	$16,868,113	$16,780,900	$16,710,084	$6,937,716	$6,654,802	$6,380,373	$6,107,335	$5,834,320	$5,561,282	$5,288,267	$5,015,230
28	**PVRR Comparative (savings) cost**				**6.70%**	**($67,764,060)**	$10,229,506	$13,391,105	$13,796,618	$14,201,247	($6,937,716)	($6,654,802)	($6,380,373)	($6,107,335)	($5,834,320)	($5,561,282)	($5,288,267)	($5,015,230)
29																		
30	Trimble CCR to On-Site Landfill																	
31		Year 1	Year 2	Year 3	Year 4							$0						
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant						$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000
38	Less Accumulated Depreciation						($361,418,182)	($364,127,273)	($366,836,364)	($369,545,455)	($372,254,545)	($374,963,636)	($377,672,727)	($380,381,818)	($383,090,909)	($385,800,000)	($388,509,091)	($391,218,182)
39	Less Deferred Tax Balance						($435,424)	($929,610)	($1,307,874)	($1,578,563)	($1,750,022)	($1,829,439)	($1,824,001)	($1,804,653)	($1,785,072)	($1,765,724)	($1,746,144)	($1,726,795)
40	Environmental Compliance Rate Base						$53,746,394	$50,543,117	$47,455,762	$44,475,983	$41,595,433	$38,806,925	$36,103,272	$33,413,529	$30,724,019	$28,034,276	$25,344,765	$22,655,023
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR	$214,434,534	$5,374,639	$5,054,312	$4,745,576	$4,447,598	$4,159,543	$3,880,692	$3,610,327	$3,341,353	$3,072,402	$2,803,428	$2,534,477	$2,265,502
43																		
44	Operating Expenses per cu yd		$ 12.47			Inflation												
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$8,803,354	$9,023,438	$9,249,024	$9,480,249			$0	$0	$0	$0	$0	$0
46	Annual Depreciation						$5,459,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091
47	Annual Property Tax Expense						$89,461	$81,273	$77,209	$73,145	$69,082	$65,018	$60,955	$56,891	$52,827	$48,764	$44,700	$40,636
48	Total Operating E(m)				PVRR	$202,712,312	$14,351,906	$11,813,801	$12,035,324	$12,262,486	$2,778,173	$2,774,109	$2,770,045	$2,765,982	$2,761,918	$2,757,855	$2,753,791	$2,749,727
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$417,146,846**	$19,726,545	$16,868,113	$16,780,900	$16,710,084	$6,937,716	$6,654,802	$6,380,373	$6,107,335	$5,834,320	$5,561,282	$5,288,267	$5,015,230
50	**All in Annual Cost per Cubic Yd**						**$47.34**	**$40.48**	**$40.27**	**$40.10**	**$16.65**	**$15.97**	**$15.31**	**$14.66**	**$14.00**	**$13.35**	**$12.69**	**$12.04**

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA					End of Life										
2	**Trimble CCR to Sterling Materials**				12/29/2051	12/28/2052	12/28/2053	12/28/2054	12/28/2055	12/27/2056	12/27/2057	12/27/2058	12/27/2059	12/26/2060	12/26/2061	12/26/2062
51	Assumed Cubic Yards	416,709	Yr b/w Dates	910,000	14,168,106	14,584,815	15,001,524	15,418,233								
52	Phase I Commence Date	1/1/2018	9	8,190,000												
53	Phase II In Service Date	1/1/2027	7	6,370,000	$0	$0	$0	$0								
54	Phase III In Service Date	1/1/2034	11	10,010,000	$0	$0	$0	$0								
55	Phase IV In Service Date	1/1/2045	9	8,190,000	$0	$0	$0	$0								
56	End of 37 Years	1/1/2054	36	33,670,000												
57	Cummulative Cu Yd to begin Phase II			4,549,999												
58	Cumulative Cu Yd to begin Phase III			12,893,163												
59	Cumulative Cu Yd to begin Phase IV			24,153,290												
60	1 Depreciation Year				34	35	36	37	38	39	40	41	42	43	44	45
61	Sterling Book Depreciation Years		37		$4,827,500	$4,827,500	$4,827,500	$4,827,500	$0	$0	$0	$0	$0	$0	$0	$0
62	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
63	Difference				$4,827,500	$4,827,500	$4,827,500	$4,827,500	$0	$0	$0	$0	$0	$0	$0	$0
64	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax				$1,877,898	$1,877,898	$1,877,898	$1,877,898	$0	$0	$0	$0	$0	$0	$0	$0
66	Accumulated Deferred Tax Balance				($5,633,693)	($3,755,795)	($1,877,898)	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
67	MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	$0	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
68																
69	Depreciation Year				34	35	36	37	38	39	40	41	42	43	44	45
70	Phase 1 Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
71	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
72	Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
73	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
75	Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0		$0	$0	$0	$0
76	MACRS Tax Depreciation Rate															
77																
78	Depreciation Year				22	23	24	25	26	27	28	29	30	31	32	33
79	Phase 2 Book Depreciation Years		22		$2,750,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
80	Tax Depreciation		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
81	Difference				$2,750,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
82	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax				$1,069,750	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
84	Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
85	MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
86																
87	Depreciation Year				2	3	4	5	6	7	8	9	10	11	12	13
88	Phase 3 Book Depreciation Years		22		$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091
89	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$4,302,524	$3,979,492	$3,681,492	$3,404,948	$3,149,860	$2,913,248	$2,695,112	$2,659,352	$2,658,756	$2,659,352	$2,658,756	$2,659,352
90	Difference				($1,593,433)	($1,270,401)	($972,401)	($695,857)	($440,769)	($204,157)	$13,979	$49,739	$50,335	$49,739	$50,335	$49,739
91	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax				($619,845)	($494,186)	($378,264)	($270,688)	($171,459)	($79,417)	$5,438	$19,348	$19,580	$19,348	$19,580	$19,348
93	Accumulated Deferred Tax Balance				($435,424)	($929,610)	($1,307,874)	($1,578,563)	($1,750,022)	($1,829,439)	($1,824,001)	($1,804,653)	($1,785,072)	($1,765,724)	($1,746,144)	($1,726,795)
94	MACRS Tax Depreciation Rate				7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%	4.461%	4.462%	4.461%	4.462%
95																
96	Depreciation Year				0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA											
2	**Trimble CCR to Sterling Materials**						12/26/2063	12/25/2064	12/25/2065	12/25/2066	12/25/2067	12/24/2068	12/24/2069	12/24/2070	Total
3	Tons	1.17	**487,550**	745,290											
4	Cubic yards		**416,709**	637,000	Cumulative Cu Yd										
5	Gross Price per ton		**$ 17.90**	Fee + transport barge to mine											
6	0.75% IMPA/IMEA		**$ 13.43**	Net cost to KU/LGE											
7	Revenue Requirement														
8	On-Load and Off-Load Barge Facilities						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	
10	Revised Eligible Plant						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	
11	Less Accumulated Depreciation						($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	
12	Less Deferred Tax Balance						$0	$0	$0	$0	$0	$0	$0	$0	
13	Environmental Compliance Rate Base						$0	$0	$0	$0	$0	$0	$0	$0	
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
15	Total Capital E(m)				PVRR	$130,957,808	$0	$0	$0	$0	$0	$0	$0	$0	$278,002,604
16															
17	Barge Shipping Costs		$ 1.96	487,550			$0	$0	$0	$0	$0	$0	$0	$0	
18	Barge Facilities' Operating Costs					Inflation Assumption									
19	CCR to Storage Facility @		$ 17.93	per ton		2.50%	$0	$0	$0	$0	$0	$0	$0	$0	
20	Warsaw Land Lease						$0	$0	$0	$0	$0	$0	$0	$0	
21	Operating Expenses						$0	$0	$0	$0	$0	$0	$0	$0	
22	Annual Depreciation						$0	$0	$0	$0	$0	$0	$0	$0	
23	Annual Property Tax Expense						$0	$0	$0	$0	$0	$0	$0	$0	
24	Total Operating E(m)				PVRR	$218,424,978	$0	$0	$0	$0	$0	$0	$0	$0	
25	Total E(m) CCR to Sterling				**PVRR**	**$349,382,786**	$0	$0	$0	$0	$0	$0	$0	$0	**$1,102,053,989**
26	**All-in Annual Cost per Cubic Yd**														
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$417,146,846**	$4,742,215	$4,469,177	$4,196,162	$3,923,124	$3,650,110	$3,377,072	$3,104,057	$2,882,744	**$1,125,510,478**
28	**PVRR Comparative (savings) cost**				**6.70%**	**($67,764,060)**	($4,742,215)	($4,469,177)	($4,196,162)	($3,923,124)	($3,650,110)	($3,377,072)	($3,104,057)	($2,882,744)	**($23,456,488)**
29															
30	Trimble CCR to On-Site Landfill														
31		Year 1	Year 2	Year 3	Year 4										
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	
37	Revised Eligible Plant						$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	$415,600,000	
38	Less Accumulated Depreciation						($393,927,273)	($396,636,364)	($399,345,455)	($402,054,545)	($404,763,636)	($407,472,727)	($410,181,818)	($412,890,909)	
39	Less Deferred Tax Balance						($1,707,215)	($1,687,866)	($1,668,286)	($1,648,938)	($1,629,357)	($1,610,009)	($1,590,429)	($1,053,836)	
40	Environmental Compliance Rate Base						$19,965,512	$17,275,770	$14,586,259	$11,896,517	$9,207,006	$6,517,264	$3,827,753	$1,655,255	
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
42	Capital E(m)				PVRR	$214,434,534	$1,996,551	$1,727,577	$1,458,626	$1,189,652	$920,701	$651,726	$382,775	$165,525	**$472,036,554**
43															
44	Operating Expenses per cu yd		$ 12.47			Inflation									
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$0	$0	$0	$0	$0	$0	$0	$0	
46	Annual Depreciation						$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	**$399,345,455**
47	Annual Property Tax Expense						$36,573	$32,509	$28,445	$24,382	$20,318	$16,255	$12,191	$8,127	
48	Total Operating E(m)				PVRR	$202,712,312	$2,745,664	$2,741,600	$2,737,536	$2,733,473	$2,729,409	$2,725,345	$2,721,282	$2,717,218	**$639,847,197**
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$417,146,846**	$4,742,215	$4,469,177	$4,196,162	$3,923,124	$3,650,110	$3,377,072	$3,104,057	$2,882,744	**$1,108,573,371**
50	**All in Annual Cost per Cubic Yd**						**$11.38**	**$10.72**	**$10.07**	**$9.41**	**$8.76**	**$8.10**	**$7.45**	**$6.92**	

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA												
2	**Trimble CCR to Sterling Materials**					12/26/2063	12/25/2064	12/25/2065	12/25/2066	12/25/2067	12/24/2068	12/24/2069	12/24/2070	Total
51	Assumed Cubic Yards	416,709	Yr b/w Dates	910,000										
52	Phase I Commence Date	1/1/2018	9	8,190,000										
53	Phase II In Service Date	1/1/2027	7	6,370,000										
54	Phase III In Service Date	1/1/2034	11	10,010,000										
55	Phase IV In Service Date	1/1/2045	9	8,190,000										
56	End of 37 Years	1/1/2054	36	33,670,000										
57	Cummulative Cu Yd to begin Phase II			4,549,999										
58	Cumulative Cu Yd to begin Phase III			12,893,163										
59	Cumulative Cu Yd to begin Phase IV			24,153,290										
60	1 Depreciation Year					46	47	48	49	50	51	52	53	
61	Sterling Book Depreciation Years			37		$0	$0	$0	$0	$0	$0	$0	$0	$178,617,500
62	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$178,617,500
63	Difference					$0	$0	$0	$0	$0	$0	$0	$0	
64	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
65	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	($0)
66	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	
67	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	
68														
69	Depreciation Year					46	47	48	49	50	51	52	53	
70	Phase 1 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$295,500,000
71	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$295,500,000
72	Difference					$0	$0	$0	$0	$0	$0	$0	$0	
73	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
74	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0
75	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	
76	MACRS Tax Depreciation Rate													
77														
78	Depreciation Year					34	35	36	37	38	39	40	41	
79	Phase 2 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$60,500,000
80	Tax Depreciation			20		$0	$0	$0	$0	$0	$0	$0	$0	$60,500,000
81	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0
82	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
83	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0
84	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	
85	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	
86														
87	Depreciation Year					14	15	16	17	18	19	20	21	
88	Phase 3 Book Depreciation Years			22		$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$2,709,091	$56,890,909
89	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$2,658,756	$2,659,352	$2,658,756	$2,659,352	$2,658,756	$2,659,352	$2,658,756	$1,329,676	$59,600,000
90	Difference					$50,335	$49,739	$50,335	$49,739	$50,335	$49,739	$50,335	$1,379,415	($4,288,653)
91	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
92	Deferred Tax					$19,580	$19,348	$19,580	$19,348	$19,580	$19,348	$19,580	$536,592	($1,668,286)
93	Accumulated Deferred Tax Balance					($1,707,215)	($1,687,866)	($1,668,286)	($1,648,938)	($1,629,357)	($1,610,009)	($1,590,429)	($1,053,836)	
94	MACRS Tax Depreciation Rate					4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%	
95														
96	Depreciation Year					0	0	0	0	0	0	0	0	
97	Phase 4 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference					$0	$0	$0	$0	$0	$0	$0	$0	
100	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
101	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	
102	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	
103	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	

1	**Revenue Requirments Summary - E(m)**				Net of IMPA/IMEA																					
2	**Trimble CCR to Sterling Materials**								12/31/2014	12/31/2015	12/30/2016	12/31/2017	12/31/2018	12/31/2019	12/30/2020	12/31/2021	12/31/2022	12/31/2023	12/30/2024	12/31/2025	12/31/2026
3	Tons	1.17		**179,138**	745,290					Cubic Yards Per Year		600,000									
4	Cubic yards			**153,109**	637,000	Cumulative Cu Yd				Cumulative Cubic Yards -->			153,109	306,218	459,327	612,436	765,545	918,654	1,071,763	1,224,872	1,377,981
5	Gross Price per ton		$	**23.59**	Fee + transport barge to mine					Available CY in Mine		6,800,000	7,246,891	7,693,782	8,140,673	8,587,564	9,034,455	9,481,346	9,928,237	10,375,128	10,822,019
6	0.75% IMPA/IMEA		$	**17.69**	Net cost to KU/LGE																
7	Revenue Requirement																				
8	On-Load and Off-Load Barge Facilities											$26,317,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities								$0	$0	$0	$152,300,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant								$0	$0	$0	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation									$0	$0	$0	($4,827,500)	($9,655,000)	($14,482,500)	($19,310,000)	($24,137,500)	($28,965,000)	($33,792,500)	($38,620,000)	($43,447,500)
12	Less Deferred Tax Balance										$0	$0	($727,685)	($3,865,708)	($6,627,138)	($9,041,156)	($11,132,777)	($12,927,014)	($14,445,407)	($15,709,495)	($16,931,894)
13	Environmental Compliance Rate Base								$0	$0	$0	$178,617,500	$173,062,315	$165,096,792	$157,507,862	$150,266,344	$143,347,223	$136,725,486	$130,379,593	$124,288,005	$118,238,106
14	Return on Environmental Rate Base								10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)					PVRR	$130,957,808		$0	$0	$0	$17,861,750	$17,306,231	$16,509,679	$15,750,786	$15,026,634	$14,334,722	$13,672,549	$13,037,959	$12,428,800	$11,823,811
16																					
17	Barge Shipping Costs		$	1.96	179,138								$351,110	$359,887	$368,884	$378,107	$387,559	$397,248	$407,179	$417,359	$427,793
18	Barge Facilities' Operating Costs						Inflation Assumption				$0	$0	$825,000	$845,625	$866,766	$888,435	$910,646	$933,412	$956,747	$980,666	$1,005,182
19	CCR to Storage Facility @		$	22.19	per ton		2.50%						$3,975,510	$4,074,897	$4,176,770	$4,281,189	$4,388,219	$4,497,924	$4,610,372	$4,725,632	$4,843,772
20	Warsaw Land Lease												$200,000	$205,000	$210,125	$215,378	$220,763	$226,282	$231,939	$237,737	$243,681
21	Operating Expenses								$0	$0	$0	$0	$5,351,619	$5,485,410	$5,622,545	$5,763,109	$5,907,186	$6,054,866	$6,206,238	$6,361,393	$6,520,428
22	Annual Depreciation									$0	$0	$0	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
23	Annual Property Tax Expense									$0	$0	$0	$267,926	$260,685	$253,444	$246,203	$238,961	$231,720	$224,479	$217,238	$209,996
24	Total Operating E(m)					PVRR	$137,075,931		$0	$0	$0	$0	$10,447,045	$10,573,595	$10,703,489	$10,836,811	$10,973,648	$11,114,086	$11,258,216	$11,406,131	$11,557,925
25	Total E(m) CCR to Sterling					**PVRR**	**$268,033,739**		$0	$0	$0	$17,861,750	$27,753,277	$27,083,274	$26,454,275	$25,863,445	$25,308,370	$24,786,634	$24,296,176	$23,834,931	$23,381,735
26	**All-in Annual Cost per Cubic Yd**												**$181.26**	**$176.89**	**$172.78**	**$168.92**	**$165.30**	**$161.89**	**$158.69**	**$155.67**	**$152.71**
27	Total E(m) CCR to Trimble (See Row 49 below)					**PVRR**	**$350,475,613**		$0	$2,530,000	$14,947,950	$23,647,650	$43,507,625	$41,970,422	$40,398,766	$38,885,502	$37,426,515	$36,017,691	$34,655,489	$33,336,371	$32,025,188
28	**PVRR Comparative (savings) cost**					**6.70%**	**($82,441,874)**		$0	($2,530,000)	($14,947,950)	($5,785,900)	($15,754,348)	($14,887,148)	($13,944,491)	($13,022,057)	($12,118,146)	($11,231,056)	($10,359,313)	($9,501,439)	($8,643,453)
29																					
30	Trimble CCR to On-Site Landfill																				
31		Year 1		Year 2		Year 3		Year 4			$123,800,000	$81,300,000	$65,100,000								$0
32	Phase I	$25,300,000		$123,800,000		$81,300,000		$65,100,000		$25,300,000	$149,100,000	$230,400,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000		$26,200,000		$5,600,000							$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000		$26,200,000		$4,700,000							$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000		$26,200,000		$4,700,000							$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments								$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant								$0	$25,300,000	$149,100,000	$230,400,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
38	Less Accumulated Depreciation										$0	$0	($13,431,818)	($26,863,636)	($40,295,455)	($53,727,273)	($67,159,091)	($80,590,909)	($94,022,727)	($107,454,545)	($120,886,364)
39	Less Deferred Tax Balance										$0	$0	$914,371	($2,158,856)	($4,609,057)	($6,484,510)	($7,826,598)	($8,676,702)	($9,070,456)	($9,043,495)	($8,947,565)
40	Environmental Compliance Rate Base								$0	$25,300,000	$149,100,000	$230,400,000	$282,982,553	$266,477,508	$250,595,489	$235,288,217	$220,514,311	$206,232,389	$192,406,817	$179,001,959	$165,666,072
41	Return on Environmental Rate Base								10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)					PVRR	$196,825,656		$0	$2,530,000	$14,910,000	$23,040,000	$28,298,255	$26,647,751	$25,059,549	$23,528,822	$22,051,431	$20,623,239	$19,240,682	$17,900,196	$16,566,607
43																					
44	Operating Expenses per cu yd		$	12.47			Inflation														
45	Operating Expenses Net (75%)		$	9.35	cu yd		2.50%					$384,000	$1,431,952	$1,467,751	$1,504,444	$1,542,056	$1,580,607	$1,620,122	$1,660,625	$1,702,141	$1,744,694
46	Annual Depreciation										$0	$0	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
47	Annual Property Tax Expense									$0	$37,950	$223,650	$345,600	$423,102	$402,955	$382,807	$362,659	$342,511	$322,364	$302,216	$282,068
48	Total Operating E(m)					PVRR	$153,649,957		$0	$0	$37,950	$607,650	$15,209,370	$15,322,671	$15,339,217	$15,356,681	$15,375,084	$15,394,452	$15,414,807	$15,436,175	$15,458,581
49	Total Capital + Operating E(m) CCR to Landfill					**PVRR**	**$350,475,613**		$0	$2,530,000	$14,947,950	$23,647,650	$43,507,625	$41,970,422	$40,398,766	$38,885,502	$37,426,515	$36,017,691	$34,655,489	$33,336,371	$32,025,188
50	**All in Annual Cost per Cubic Yd**												**$284.16**	**$274.12**	**$263.86**	**$253.97**	**$244.44**	**$235.24**	**$226.35**	**$217.73**	**$209.17**

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**				12/31/2014	12/31/2015	12/30/2016	12/31/2017	12/31/2018	12/31/2019	12/30/2020	12/31/2021	12/31/2022	12/31/2023	12/30/2024	12/31/2025	12/31/2026
51	Assumed Cubic Yards	**153,109**	Yr b/w Dates	910,000			Cumulative Cubic Yards -->		153,109	306,218	459,327	612,436	765,545	918,654	1,071,763	1,224,872	1,377,981
52	Phase I Commence Date	1/1/2018	9	8,190,000													
53	Phase II In Service Date	1/1/2027	7	6,370,000					$0	$0	$0	$0	$0	$0	$0	$0	$0
54	Phase III In Service Date	1/1/2034	11	10,010,000					$0	$0	$0	$0	$0	$0	$0	$0	$0
55	Phase IV In Service Date	1/1/2045	9	8,190,000					$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000													
57	Cummulative Cu Yd to begin Phase II			4,549,999													
58	Cumulative Cu Yd to begin Phase III			13,947,563													
59	Cumulative Cu Yd to begin Phase IV			24,416,890													
60	1 Depreciation Year								1	2	3	4	5	6	7	8	9
61	Sterling Book Depreciation Years		37				$0		$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
62	Tax Depreciation (20yr MACRS unless life < 20yrs)		20				$0		$6,698,156	$12,894,397	$11,926,290	$11,033,203	$10,204,418	$9,439,935	$8,730,823	$8,077,083	$7,969,913
63	Difference						$0	$0	($1,870,656)	($8,066,897)	($7,098,790)	($6,205,703)	($5,376,918)	($4,612,435)	($3,903,323)	($3,249,583)	($3,142,413)
64	Rate						38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax						$0	$0	($727,685)	($3,138,023)	($2,761,429)	($2,414,018)	($2,091,621)	($1,794,237)	($1,518,393)	($1,264,088)	($1,222,399)
66	Accumulated Deferred Tax Balance						$0	$0	($727,685)	($3,865,708)	($6,627,138)	($9,041,156)	($11,132,777)	($12,927,014)	($14,445,407)	($15,709,495)	($16,931,894)
67	MACRS Tax Depreciation Rate								3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%
68																	
69	Depreciation Year								1	2	3	4	5	6	7	8	9
70	Phase 1 Book Depreciation Years		22				$0	$0	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
71	Tax Depreciation (20yr MACRS unless life < 20yrs)		20				$0	$0	$11,081,250	$21,332,145	$19,730,535	$18,253,035	$16,881,915	$15,617,175	$14,444,040	$13,362,510	$13,185,210
72	Difference						$0	$0	$2,350,568	($7,900,327)	($6,298,717)	($4,821,217)	($3,450,097)	($2,185,357)	($1,012,222)	$69,308	$246,608
73	Rate						38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax						$0	$0	$914,371	($3,073,227)	($2,450,201)	($1,875,453)	($1,342,088)	($850,104)	($393,754)	$26,961	$95,931
75	Accumulated Deferred Tax Balance						$0	$0	$914,371	($2,158,856)	($4,609,057)	($6,484,510)	($7,826,598)	($8,676,702)	($9,070,456)	($9,043,495)	($8,947,565)
76	MACRS Tax Depreciation Rate								3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%
77																	
78	Depreciation Year								0	0	0	0	0	0	0	0	0
79	Phase 2 Book Depreciation Years		22						$0	$0	$0	$0	$0	$0	$0	$0	$0
80	Tax Depreciation		20						$0	$0	$0	$0	$0	$0	$0	$0	$0
81	Difference								$0	$0	$0	$0	$0	$0	$0	$0	$0
82	Rate								38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax								$0	$0	$0	$0	$0	$0	$0	$0	$0
84	Accumulated Deferred Tax Balance								$0	$0	$0	$0	$0	$0	$0	$0	$0
85	MACRS Tax Depreciation Rate								0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
86																	
87	Depreciation Year								0	0	0	0	0	0	0	0	0
88	Phase 3 Book Depreciation Years		22						$0	$0	$0	$0	$0	$0	$0	$0	$0
89	Tax Depreciation (20yr MACRS unless life < 20yrs)		20						$0	$0	$0	$0	$0	$0	$0	$0	$0
90	Difference								$0	$0	$0	$0	$0	$0	$0	$0	$0
91	Rate								38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax								$0	$0	$0	$0	$0	$0	$0	$0	$0
93	Accumulated Deferred Tax Balance								$0	$0	$0	$0	$0	$0	$0	$0	$0
94	MACRS Tax Depreciation Rate								0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
95																	
96	Depreciation Year								0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years		22						$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)		20						$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference								$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate								38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax								$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance								$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate								0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA														
2	**Trimble CCR to Sterling Materials**						12/31/2027	12/30/2028	12/31/2029	12/30/2030	12/31/2031	12/30/2032	12/31/2033	12/31/2034	12/31/2035	12/30/2036	12/31/2037	12/31/2038
3	Tons	1.17	**179,138**	745,290														
4	Cubic yards		**153,109**	637,000	Cumulative Cu Yd		1,531,090	1,684,199	1,837,308	1,990,417	2,143,526	2,296,635	2,449,744	2,602,853	2,755,962	2,909,071	3,062,180	3,215,289
5	Gross Price per ton		$ **23.59**	Fee + transport barge to mine			11,268,910	11,715,801	12,162,692	12,609,583	13,056,474	13,503,365	13,950,256	14,397,147	14,844,038	15,290,929	15,737,820	16,184,711
6	0.75% IMPA/IMEA		$ **17.69**	Net cost to KU/LGE														
7	Revenue Requirement																	
8	On-Load and Off-Load Barge Facilities						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation						($48,275,000)	($53,102,500)	($57,930,000)	($62,757,500)	($67,585,000)	($72,412,500)	($77,240,000)	($82,067,500)	($86,895,000)	($91,722,500)	($96,550,000)	($101,377,500)
12	Less Deferred Tax Balance						($18,153,598)	($19,375,996)	($20,597,700)	($21,820,099)	($23,041,802)	($24,264,201)	($25,485,905)	($26,708,303)	($27,930,007)	($29,152,406)	($30,374,109)	($30,046,360)
13	Environmental Compliance Rate Base						$112,188,902	$106,139,004	$100,089,800	$94,039,901	$87,990,698	$81,940,799	$75,891,595	$69,841,697	$63,792,493	$57,742,594	$51,693,391	$47,193,640
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR	$130,957,808	$11,218,890	$10,613,900	$10,008,980	$9,403,990	$8,799,070	$8,194,080	$7,589,160	$6,984,170	$6,379,249	$5,774,259	$5,169,339	$4,719,364
16																		
17	Barge Shipping Costs		$ 1.96	179,138			$438,488	$449,450	$460,686	$472,203	$484,008	$496,109	$508,511	$521,224	$534,255	$547,611	$561,301	$575,334
18	Barge Facilities' Operating Costs					Inflation Assumption	$1,030,312	$1,056,070	$1,082,471	$1,109,533	$1,137,272	$1,165,703	$1,194,846	$1,224,717	$1,255,335	$1,286,718	$1,318,886	$1,351,859
19	CCR to Storage Facility @		$ 22.19	per ton		2.50%	$4,964,867	$5,088,988	$5,216,213	$5,346,618	$5,480,284	$5,617,291	$5,757,723	$5,901,666	$6,049,208	$6,200,438	$6,355,449	$6,514,335
20	Warsaw Land Lease						$249,773	$256,017	$262,417	$268,978	$275,702	$282,595	$289,660	$296,901	$304,324	$311,932	$319,730	$327,723
21	Operating Expenses						$6,683,439	$6,850,525	$7,021,788	$7,197,333	$7,377,266	$7,561,698	$7,750,740	$7,944,509	$8,143,121	$8,346,700	$8,555,367	$8,769,251
22	Annual Depreciation						$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
23	Annual Property Tax Expense						$202,755	$195,514	$188,273	$181,031	$173,790	$166,549	$159,308	$152,066	$144,825	$137,584	$130,343	$123,101
24	Total Operating E(m)				PVRR	$137,075,931	$11,713,694	$11,873,539	$12,037,561	$12,205,864	$12,378,556	$12,555,747	$12,737,548	$12,924,075	$13,115,446	$13,311,783	$13,513,210	$13,719,852
25	Total E(m) CCR to Sterling				**PVRR**	**$268,033,739**	$22,932,584	$22,487,439	$22,046,541	$21,609,854	$21,177,626	$20,749,826	$20,326,707	$19,908,245	$19,494,696	$19,086,043	$18,682,549	$18,439,216
26	**All-in Annual Cost per Cubic Yd**						**$149.78**	**$146.87**	**$143.99**	**$141.14**	**$138.32**	**$135.52**	**$132.76**	**$130.03**	**$127.33**	**$124.66**	**$122.02**	**$120.43**
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$350,475,613**	$30,715,184	$29,406,155	$28,098,359	$26,791,594	$25,486,117	$24,181,730	$22,878,691	$21,576,802	$20,276,324	$18,977,060	$17,679,272	$16,639,218
28	**PVRR Comparative (savings) cost**				**6.70%**	**($82,441,874)**	($7,782,599)	($6,918,716)	($6,051,818)	($5,181,739)	($4,308,492)	($3,431,904)	($2,551,984)	($1,668,557)	($781,628)	$108,983	$1,003,276	$1,799,999
29																		
30	**Trimble CCR to On-Site Landfill**																	
31		Year 1	Year 2	Year 3	Year 4		$0	$0					$0					$0
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0		$0	$0	$0	$0
37	Revised Eligible Plant						$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
38	Less Accumulated Depreciation						($134,318,182)	($147,750,000)	($161,181,818)	($174,613,636)	($188,045,455)	($201,477,273)	($214,909,091)	($228,340,909)	($241,772,727)	($255,204,545)	($268,636,364)	($282,068,182)
39	Less Deferred Tax Balance						($8,850,485)	($8,754,554)	($8,657,474)	($8,561,543)	($8,464,463)	($8,368,533)	($8,271,453)	($8,175,522)	($8,078,442)	($7,982,511)	($7,885,431)	($5,224,977)
40	Environmental Compliance Rate Base						$152,331,334	$138,995,446	$125,660,708	$112,324,820	$98,990,082	$85,654,195	$72,319,457	$58,983,569	$45,648,831	$32,312,943	$18,978,205	$8,206,841
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR	$196,825,656	$15,233,133	$13,899,545	$12,566,071	$11,232,482	$9,899,008	$8,565,419	$7,231,946	$5,898,357	$4,564,883	$3,231,294	$1,897,821	$820,684
43																		
44	Operating Expenses per cu yd		$ 12.47			Inflation												
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$1,788,312	$1,833,020	$1,878,845	$1,925,816	$1,973,962	$2,023,311	$2,073,893	$2,125,741	$2,178,884	$2,233,356	$2,289,190	$2,346,420
46	Annual Depreciation						$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
47	Annual Property Tax Expense						$261,920	$241,773	$221,625	$201,477	$181,330	$161,182	$141,034	$120,886	$100,739	$80,591	$60,443	$40,295
48	Total Operating E(m)				PVRR	$153,649,957	$15,482,050	$15,506,610	$15,532,288	$15,559,112	$15,587,109	$15,616,311	$15,646,746	$15,678,445	$15,711,441	$15,745,765	$15,781,452	$15,818,534
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$350,475,613**	$30,715,184	$29,406,155	$28,098,359	$26,791,594	$25,486,117	$24,181,730	$22,878,691	$21,576,802	$20,276,324	$18,977,060	$17,679,272	$16,639,218
50	**All in Annual Cost per Cubic Yd**						**$200.61**	**$192.06**	**$183.52**	**$174.98**	**$166.46**	**$157.94**	**$149.43**	**$140.92**	**$132.43**	**$123.94**	**$115.47**	**$108.68**

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA															
2	**Trimble CCR to Sterling Materials**					12/31/2027	12/30/2028	12/31/2029	12/30/2030	12/31/2031	12/30/2032	12/31/2033	12/31/2034	12/31/2035	12/30/2036	12/31/2037	12/31/2038
51	Assumed Cubic Yards	153,109	Yr b/w Dates	910,000		1,531,090	1,684,199	1,837,308	1,990,417	2,143,526	2,296,635	2,449,744	2,602,853	2,755,962	2,909,071	3,062,180	3,215,289
52	Phase I Commence Date	1/1/2018	9	8,190,000													
53	Phase II In Service Date	1/1/2027	7	6,370,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
54	Phase III In Service Date	1/1/2034	11	10,010,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
55	Phase IV In Service Date	1/1/2045	9	8,190,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000													
57	Cummulative Cu Yd to begin Phase II			4,549,999													
58	Cumulative Cu Yd to begin Phase III			13,947,563													
59	Cumulative Cu Yd to begin Phase IV			24,416,890													
60	1 Depreciation Year					10	11	12	13	14	15	16	17	18	19	20	21
61	Sterling Book Depreciation Years			37		$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
62	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$7,969,913	$7,968,127	$3,984,956
63	Difference					($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	($3,142,413)	($3,140,627)	$842,544
64	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax					($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	($1,222,399)	($1,221,704)	$327,749
66	Accumulated Deferred Tax Balance					($18,153,598)	($19,375,996)	($20,597,700)	($21,820,099)	($23,041,802)	($24,264,201)	($25,485,905)	($26,708,303)	($27,930,007)	($29,152,406)	($30,374,109)	($30,046,360)
67	MACRS Tax Depreciation Rate					4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%
68																	
69	Depreciation Year					10	11	12	13	14	15	16	17	18	19	20	21
70	Phase 1 Book Depreciation Years			22		$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818	$13,431,818
71	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$13,185,210	$13,182,255	$6,592,605
72	Difference					$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$246,608	$249,563	$6,839,213
73	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax					$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$95,931	$97,080	$2,660,454
75	Accumulated Deferred Tax Balance					($8,850,485)	($8,754,554)	($8,657,474)	($8,561,543)	($8,464,463)	($8,368,533)	($8,271,453)	($8,175,522)	($8,078,442)	($7,982,511)	($7,885,431)	($5,224,977)
76	MACRS Tax Depreciation Rate					4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%
77																	
78	Depreciation Year					0	0	0	0	0	0	0	0	0	0	0	0
79	Phase 2 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
80	Tax Depreciation			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
81	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
82	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
84	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
85	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
86																	
87	Depreciation Year					0	0	0	0	0	0	0	0	0	0	0	0
88	Phase 3 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
89	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
90	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
91	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
93	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
94	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
95																	
96	Depreciation Year					0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA														
2	**Trimble CCR to Sterling Materials**						12/31/2039	12/30/2040	12/31/2041	12/31/2042	12/31/2043	12/30/2044	12/30/2045	12/30/2046	12/30/2047	12/29/2048	12/29/2049	12/29/2050
3	Tons	1.17	**179,138**	745,290														
4	Cubic yards		**153,109**	637,000	Cumulative Cu Yd		3,368,398	3,521,507	3,674,616	3,827,725	3,980,834	4,133,943	4,287,052	4,440,161	4,593,270	4,746,379	4,899,488	5,052,597
5	Gross Price per ton		$ **23.59**	Fee + transport barge to mine			16,631,602	17,078,493	17,525,384	17,972,275	18,419,166	18,866,057	19,312,948	19,759,839	20,206,730	20,653,621	21,100,512	21,547,403
6	0.75% IMPA/IMEA		$ **17.69**	Net cost to KU/LGE														
7	Revenue Requirement																	
8	On-Load and Off-Load Barge Facilities						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation						($106,205,000)	($111,032,500)	($115,860,000)	($120,687,500)	($125,515,000)	($130,342,500)	($135,170,000)	($139,997,500)	($144,825,000)	($149,652,500)	($154,480,000)	($159,307,500)
12	Less Deferred Tax Balance						($28,168,463)	($26,290,565)	($24,412,668)	($22,534,770)	($20,656,873)	($18,778,975)	($16,901,078)	($15,023,180)	($13,145,283)	($11,267,385)	($9,389,488)	($7,511,590)
13	Environmental Compliance Rate Base						$44,244,038	$41,294,435	$38,344,833	$35,395,230	$32,445,628	$29,496,025	$26,546,423	$23,596,820	$20,647,218	$17,697,615	$14,748,013	$11,798,410
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR	$130,957,808	$4,424,404	$4,129,444	$3,834,483	$3,539,523	$3,244,563	$2,949,603	$2,654,642	$2,359,682	$2,064,722	$1,769,762	$1,474,801	$1,179,841
16																		
17	Barge Shipping Costs		$ 1.96	179,138			$589,717	$604,460	$619,572	$635,061	$650,937	$667,211	$683,891	$700,988	$718,513	$736,476	$754,888	$773,760
18	Barge Facilities' Operating Costs					Inflation Assumption	$1,385,655	$1,420,296	$1,455,804	$1,492,199	$1,529,504	$1,567,741	$1,606,935	$1,647,108	$1,688,286	$1,730,493	$1,773,756	$1,818,099
19	CCR to Storage Facility @		$ 22.19	per ton		2.50%	$6,677,194	$6,844,124	$7,015,227	$7,190,607	$7,370,373	$7,554,632	$7,743,498	$7,937,085	$8,135,512	$8,338,900	$8,547,373	$8,761,057
20	Warsaw Land Lease						$335,916	$344,314	$352,922	$361,745	$370,789	$380,059	$389,560	$399,299	$409,281	$419,514	$430,001	$440,751
21	Operating Expenses						$8,988,482	$9,213,195	$9,443,524	$9,679,613	$9,921,603	$10,169,643	$10,423,884	$10,684,481	$10,951,593	$11,225,383	$11,506,017	$11,793,668
22	Annual Depreciation						$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
23	Annual Property Tax Expense						$115,860	$108,619	$101,378	$94,136	$86,895	$79,654	$72,413	$65,171	$57,930	$50,689	$43,448	$36,206
24	Total Operating E(m)				PVRR	$137,075,931	$13,931,842	$14,149,313	$14,372,402	$14,601,249	$14,835,998	$15,076,797	$15,323,796	$15,577,152	$15,837,023	$16,103,572	$16,376,965	$16,657,374
25	Total E(m) CCR to Sterling				**PVRR**	**$268,033,739**	$18,356,246	$18,278,757	$18,206,885	$18,140,772	$18,080,561	$18,026,399	$17,978,439	$17,936,834	$17,901,745	$17,873,333	$17,851,766	$17,837,215
26	**All-in Annual Cost per Cubic Yd**						**$119.89**	**$119.38**	**$118.91**	**$118.48**	**$118.09**	**$117.74**	**$117.42**	**$117.15**	**$116.92**	**$116.74**	**$116.60**	**$116.50**
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$350,475,613**	$15,857,046	$2,465,207	$2,526,838	$2,590,009	$2,654,759	$2,721,128	$2,789,156	$2,858,885	$5,800,357	$8,536,666	$11,704,777	$11,448,099
28	**PVRR Comparative (savings) cost**				**6.70%**	**($82,441,874)**	$2,499,200	$15,813,549	$15,680,047	$15,550,763	$15,425,802	$15,305,271	$15,189,283	$15,077,949	$12,101,388	$9,336,667	$6,146,989	$6,389,116
29																		
30	**Trimble CCR to On-Site Landfill**																	
31		Year 1	Year 2	Year 3	Year 4		$0	$0	$0									
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000	$5,600,000	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant						$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$324,200,000	$350,400,000	$356,000,000	$356,000,000
38	Less Accumulated Depreciation						($295,500,000)	($295,500,000)	($295,500,000)	($295,500,000)	($295,500,000)	($295,500,000)	($295,500,000)	($295,500,000)	($295,500,000)	($295,500,000)	($298,250,000)	($301,000,000)
39	Less Deferred Tax Balance						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$187,206	($441,999)
40	Environmental Compliance Rate Base						($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	$28,700,000	$54,900,000	$57,937,206	$54,558,001
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR	$196,825,656	($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	$2,870,000	$5,490,000	$5,793,721	$5,455,800
43																		
44	Operating Expenses per cu yd		$ 12.47			Inflation												
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$2,405,080	$2,465,207	$2,526,838	$2,590,009	$2,654,759	$2,721,128	$2,789,156	$2,858,885	$2,930,357	$3,003,616	$3,078,706	$3,155,674
46	Annual Depreciation						$13,431,818	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,750,000	$2,750,000
47	Annual Property Tax Expense						$20,148	($0)	($0)	($0)	($0)	($0)	($0)	($0)	($0)	$43,050	$82,350	$86,625
48	Total Operating E(m)				PVRR	$153,649,957	$15,857,046	$2,465,207	$2,526,838	$2,590,009	$2,654,759	$2,721,128	$2,789,156	$2,858,885	$2,930,357	$3,046,666	$5,911,056	$5,992,299
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$350,475,613**	$15,857,046	$2,465,207	$2,526,838	$2,590,009	$2,654,759	$2,721,128	$2,789,156	$2,858,885	$5,800,357	$8,536,666	$11,704,777	$11,448,099
50	**All in Annual Cost per Cubic Yd**						**$103.57**	**$16.10**	**$16.50**	**$16.92**	**$17.34**	**$17.77**	**$18.22**	**$18.67**	**$37.88**	**$55.76**	**$76.45**	**$74.77**

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA														
2	**Trimble CCR to Sterling Materials**					12/31/2039	12/30/2040	12/31/2041	12/31/2042	12/31/2043	12/30/2044	12/30/2045	12/30/2046	12/30/2047	12/29/2048	12/29/2049	12/29/2050
51	Assumed Cubic Yards	**153,109**	Yr b/w Dates	910,000		3,368,398	3,521,507	3,674,616	3,827,725	3,980,834	4,133,943	4,287,052	4,440,161	4,593,270	4,746,379	4,899,488	5,052,597
52	Phase I Commence Date	1/1/2018	9	8,190,000													
53	Phase II In Service Date	1/1/2027	7	6,370,000		$0	$0	$0	$0	$0	$0	$0	$0	$28,700,000	$26,200,000	$5,600,000	$0
54	Phase III In Service Date	1/1/2034	11	10,010,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
55	Phase IV In Service Date	1/1/2045	9	8,190,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
56	End of 37 Years	1/1/2054	36	33,670,000													
57	Cummulative Cu Yd to begin Phase II			4,549,999													
58	Cumulative Cu Yd to begin Phase III			13,947,563													
59	Cumulative Cu Yd to begin Phase IV			24,416,890													
60	1 Depreciation Year					22	23	24	25	26	27	28	29	30	31	32	33
61	Sterling Book Depreciation Years				37	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
62	Tax Depreciation (20yr MACRS unless life < 20yrs)				20	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
63	Difference					$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500	$4,827,500
64	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax					$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898	$1,877,898
66	Accumulated Deferred Tax Balance					($28,168,463)	($26,290,565)	($24,412,668)	($22,534,770)	($20,656,873)	($18,778,975)	($16,901,078)	($15,023,180)	($13,145,283)	($11,267,385)	($9,389,488)	($7,511,590)
67	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
68																	
69	Depreciation Year					22	23	24	25	26	27	28	29	30	31	32	33
70	Phase 1 Book Depreciation Years				22	$13,431,818	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
71	Tax Depreciation (20yr MACRS unless life < 20yrs)				20	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
72	Difference					$13,431,818	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
73	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax					$5,224,977	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
75	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
76	MACRS Tax Depreciation Rate																
77																	
78	Depreciation Year					0	0	0	0	0	0	0	0	0	0	1	2
79	Phase 2 Book Depreciation Years				22	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,750,000	$2,750,000
80	Tax Depreciation				20	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,268,750	$4,367,495
81	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$481,250	($1,617,495)
82	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$187,206	($629,206)
84	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$187,206	($441,999)
85	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	3.750%	7.219%
86																	
87	Depreciation Year					0	0	0	0	0	0	0	0	0	0	0	0
88	Phase 3 Book Depreciation Years				22	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
89	Tax Depreciation (20yr MACRS unless life < 20yrs)				20	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
90	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
91	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
93	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
94	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
95																	
96	Depreciation Year					0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years				22	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)				20	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

									End of Life								
1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA													
2	**Trimble CCR to Sterling Materials**						12/29/2051	12/28/2052	12/28/2053	12/28/2054	12/28/2055	12/27/2056	12/27/2057	12/27/2058	12/27/2059	12/26/2060	12/26/2061	12/26/2062
3	Tons	1.17	**179,138**	745,290														
4	Cubic yards		**153,109**	637,000	Cumulative Cu Yd		5,205,706	5,358,815	5,511,924	5,665,033								
5	Gross Price per ton		**$ 23.59**	Fee + transport barge to mine			21,994,294	22,441,185	22,888,076	23,334,967								
6	0.75% IMPA/IMEA		**$ 17.69**	Net cost to KU/LGE														
7	Revenue Requirement																	
8	On-Load and Off-Load Barge Facilities						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Revised Eligible Plant						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500
11	Less Accumulated Depreciation						($164,135,000)	($168,962,500)	($173,790,000)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)
12	Less Deferred Tax Balance						($5,633,693)	($3,755,795)	($1,877,898)	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
13	Environmental Compliance Rate Base						$8,848,808	$5,899,205	$2,949,603	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
15	Total Capital E(m)				PVRR	$130,957,808	$884,881	$589,921	$294,960	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
16																		
17	Barge Shipping Costs		$ 1.96	179,138			$793,104	$812,932	$833,255	$854,086	$0	$0	$0	$0	$0	$0	$0	$0
18	Barge Facilities' Operating Costs					Inflation Assumption	$1,863,552	$1,910,141	$1,957,894	$2,006,842	$0							
19	CCR to Storage Facility @		$ 22.19	per ton		2.50%	$8,980,083	$9,204,585	$9,434,700	$9,670,568	$0	$0	$0	$0	$0	$0	$0	$0
20	Warsaw Land Lease						$451,770	$463,064	$474,641	$486,507	$0	$0	$0	$0	$0	$0	$0	$0
21	Operating Expenses						$12,088,510	$12,390,722	$12,700,490	$13,018,003	$0	$0	$0	$0	$0	$0	$0	$0
22	Annual Depreciation						$4,827,500	$4,827,500	$4,827,500	$4,827,500	$0	$0	$0	$0	$0	$0	$0	$0
23	Annual Property Tax Expense						$28,965	$21,724	$14,483	$7,241	$0	$0	$0	$0	$0	$0	$0	$0
24	Total Operating E(m)				PVRR	$137,075,931	$16,944,975	$17,239,946	$17,542,473	$17,852,744	$0	$0	$0	$0	$0	$0	$0	$0
25	Total E(m) CCR to Sterling				**PVRR**	**$268,033,739**	$17,829,855	$17,829,867	$17,837,433	$17,852,744	($0)	($0)	$0	$0	$0	$0	$0	$0
26	**All-in Annual Cost per Cubic Yd**						**$116.45**	**$116.45**	**$116.50**	**$116.60**								
27	Total E(m) CCR to Trimble (See Row 49 below)				**PVRR**	**$350,475,613**	$11,197,701	$10,961,043	$10,737,326	$10,525,754	$6,755,294	$6,476,721	$6,199,560	$5,922,422	$5,645,261	$5,368,124	$5,090,963	$4,813,825
28	**PVRR Comparative (savings) cost**				**6.70%**	**($82,441,874)**	$6,632,154	$6,868,824	$7,100,107	$7,326,990	($6,755,294)	($6,476,721)	($6,199,560)	($5,922,422)	($5,645,261)	($5,368,124)	($5,090,963)	($4,813,825)
29																		
30	**Trimble CCR to On-Site Landfill**																	
31		Year 1	Year 2	Year 3	Year 4							$0						
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Revised Eligible Plant						$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000
38	Less Accumulated Depreciation						($303,750,000)	($306,500,000)	($309,250,000)	($312,000,000)	($314,750,000)	($317,500,000)	($320,250,000)	($323,000,000)	($325,750,000)	($328,500,000)	($331,250,000)	($334,000,000)
39	Less Deferred Tax Balance						($943,648)	($1,327,624)	($1,602,400)	($1,776,448)	($1,857,065)	($1,851,545)	($1,831,904)	($1,812,028)	($1,792,388)	($1,772,512)	($1,752,871)	($1,732,995)
40	Environmental Compliance Rate Base						$51,306,352	$48,172,376	$45,147,600	$42,223,552	$39,392,935	$36,648,455	$33,918,096	$31,187,972	$28,457,612	$25,727,488	$22,997,129	$20,267,005
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
42	Capital E(m)				PVRR	$196,825,656	$5,130,635	$4,817,238	$4,514,760	$4,222,355	$3,939,294	$3,664,846	$3,391,810	$3,118,797	$2,845,761	$2,572,749	$2,299,713	$2,026,700
43																		
44	Operating Expenses per cu yd		$ 12.47			Inflation												
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$3,234,566	$3,315,430	$3,398,316	$3,483,274			$0	$0	$0	$0	$0	$0
46	Annual Depreciation						$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000
47	Annual Property Tax Expense						$82,500	$78,375	$74,250	$70,125	$66,000	$61,875	$57,750	$53,625	$49,500	$45,375	$41,250	$37,125
48	Total Operating E(m)				PVRR	$153,649,957	$6,067,066	$6,143,805	$6,222,566	$6,303,399	$2,816,000	$2,811,875	$2,807,750	$2,803,625	$2,799,500	$2,795,375	$2,791,250	$2,787,125
49	Total Capital + Operating E(m) CCR to Landfill				**PVRR**	**$350,475,613**	$11,197,701	$10,961,043	$10,737,326	$10,525,754	$6,755,294	$6,476,721	$6,199,560	$5,922,422	$5,645,261	$5,368,124	$5,090,963	$4,813,825
50	**All in Annual Cost per Cubic Yd**						**$73.14**	**$71.59**	**$70.13**	**$68.75**	**$44.12**	**$42.30**	**$40.49**	**$38.68**	**$36.87**	**$35.06**	**$33.25**	**$31.44**

1	**Revenue Requirments Summary - E(m)**		Net of IMPA/IMEA						End of Life									
2	**Trimble CCR to Sterling Materials**					12/29/2051	12/28/2052	12/28/2053	12/28/2054	12/28/2055	12/27/2056	12/27/2057	12/27/2058	12/27/2059	12/26/2060	12/26/2061	12/26/2062
51	Assumed Cubic Yards	**153,109**	Yr b/w Dates	910,000		5,205,706	5,358,815	5,511,924	5,665,033								
52	Phase I Commence Date	1/1/2018	9	8,190,000													
53	Phase II In Service Date	1/1/2027	7	6,370,000		$0	$0	$0	$0								
54	Phase III In Service Date	1/1/2034	11	10,010,000		$0	$0	$0	$0								
55	Phase IV In Service Date	1/1/2045	9	8,190,000		$0	$0	$0	$0								
56	End of 37 Years	1/1/2054	36	33,670,000													
57	Cummulative Cu Yd to begin Phase II			4,549,999													
58	Cumulative Cu Yd to begin Phase III			13,947,563													
59	Cumulative Cu Yd to begin Phase IV			24,416,890													
60	1 Depreciation Year					34	35	36	37	38	39	40	41	42	43	44	45
61	Sterling Book Depreciation Years			37		$4,827,500	$4,827,500	$4,827,500	$4,827,500	$0	$0	$0	$0	$0	$0	$0	$0
62	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
63	Difference					$4,827,500	$4,827,500	$4,827,500	$4,827,500	$0	$0	$0	$0	$0	$0	$0	$0
64	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
65	Deferred Tax					$1,877,898	$1,877,898	$1,877,898	$1,877,898	$0	$0	$0	$0	$0	$0	$0	$0
66	Accumulated Deferred Tax Balance					($5,633,693)	($3,755,795)	($1,877,898)	($0)	($0)	($0)	$0	$0	$0	$0	$0	$0
67	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	$0	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
68																	
69	Depreciation Year					34	35	36	37	38	39	40	41	42	43	44	45
70	Phase 1 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
71	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
72	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
73	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
74	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
75	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0		$0	$0	$0	$0
76	MACRS Tax Depreciation Rate																
77																	
78	Depreciation Year					3	4	5	6	7	8	9	10	11	12	13	14
79	Phase 2 Book Depreciation Years			22		$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000
80	Tax Depreciation			20		$4,039,585	$3,737,085	$3,456,365	$3,197,425	$2,957,240	$2,735,810	$2,699,510	$2,698,905	$2,699,510	$2,698,905	$2,699,510	$2,698,905
81	Difference					($1,289,585)	($987,085)	($706,365)	($447,425)	($207,240)	$14,190	$50,490	$51,095	$50,490	$51,095	$50,490	$51,095
82	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
83	Deferred Tax					($501,649)	($383,976)	($274,776)	($174,048)	($80,616)	$5,520	$19,641	$19,876	$19,641	$19,876	$19,641	$19,876
84	Accumulated Deferred Tax Balance					($943,648)	($1,327,624)	($1,602,400)	($1,776,448)	($1,857,065)	($1,851,545)	($1,831,904)	($1,812,028)	($1,792,388)	($1,772,512)	($1,752,871)	($1,732,995)
85	MACRS Tax Depreciation Rate					6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%
86																	
87	Depreciation Year					0	0	0	0	0	0	0	0	0	0	0	0
88	Phase 3 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
89	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
90	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
91	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
92	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
93	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
94	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
95																	
96	Depreciation Year					0	0	0	0	0	0	0	0	0	0	0	0
97	Phase 4 Book Depreciation Years			22		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
98	Tax Depreciation (20yr MACRS unless life < 20yrs)			20		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
99	Difference					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100	Rate					38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%
101	Deferred Tax					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
102	Accumulated Deferred Tax Balance					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
103	MACRS Tax Depreciation Rate					0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

1	**Revenue Requirments Summary - E(m)**				Net of IMPA/IMEA										
2	**Trimble CCR to Sterling Materials**						12/26/2063	12/25/2064	12/25/2065	12/25/2066	12/25/2067	12/24/2068	12/24/2069	12/24/2070	Total
3	Tons	1.17	**179,138**		745,290										
4	Cubic yards		**153,109**		637,000	Cumulative Cu Yd									
5	Gross Price per ton		**$ 23.59**		Fee + transport barge to mine										
6	0.75% IMPA/IMEA		**$ 17.69**		Net cost to KU/LGE										
7	Revenue Requirement														
8	On-Load and Off-Load Barge Facilities						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	
9	Additional Required Facilities						$0	$0	$0	$0	$0	$0	$0	$0	
10	Revised Eligible Plant						$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	$178,617,500	
11	Less Accumulated Depreciation						($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	($178,617,500)	
12	Less Deferred Tax Balance						$0	$0	$0	$0	$0	$0	$0	$0	
13	Environmental Compliance Rate Base						$0	$0	$0	$0	$0	$0	$0	$0	
14	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
15	Total Capital E(m)					PVRR $130,957,808	$0	$0	$0	$0	$0	$0	$0	$0	$278,002,604
16															
17	Barge Shipping Costs		$ 1.96		179,138		$0	$0	$0	$0	$0	$0	$0	$0	
18	Barge Facilities' Operating Costs					Inflation Assumption									
19	CCR to Storage Facility @		$ 22.19	per ton		2.50%	$0	$0	$0	$0	$0	$0	$0	$0	
20	Warsaw Land Lease						$0	$0	$0	$0	$0	$0	$0	$0	
21	Operating Expenses						$0	$0	$0	$0	$0	$0	$0	$0	
22	Annual Depreciation						$0	$0	$0	$0	$0	$0	$0	$0	
23	Annual Property Tax Expense						$0	$0	$0	$0	$0	$0	$0	$0	
24	Total Operating E(m)					PVRR $137,075,931	$0	$0	$0	$0	$0	$0	$0	$0	
25	Total E(m) CCR to Sterling					**PVRR $268,033,739**	$0	$0	$0	$0	$0	$0	$0	$0	**$781,384,045**
26	**All-in Annual Cost per Cubic Yd**														
27	Total E(m) CCR to Trimble (See Row 49 below)					**PVRR $350,475,613**	$4,536,665	$4,259,527	$3,982,366	$3,705,229	$3,428,068	$3,150,930	$2,926,275	$2,754,125	**$852,445,779**
28	**PVRR Comparative (savings) cost**					**6.70% ($82,441,874)**	($4,536,665)	($4,259,527)	($3,982,366)	($3,705,229)	($3,428,068)	($3,150,930)	($2,926,275)	($2,754,125)	**($71,061,734)**
29															
30	**Trimble CCR to On-Site Landfill**														
31		Year 1	Year 2	Year 3	Year 4										
32	Phase I	$25,300,000	$123,800,000	$81,300,000	$65,100,000		$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	$295,500,000	
33	Phase II	$28,700,000	$26,200,000	$5,600,000			$0	$0	$0	$0	$0	$0	$0	$0	
34	Phase III	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	
35	Phase IV	$28,700,000	$26,200,000	$4,700,000			$0	$0	$0	$0	$0	$0	$0	$0	
36	Other Adjustments						$0	$0	$0	$0	$0	$0	$0	$0	
37	Revised Eligible Plant						$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	$356,000,000	
38	Less Accumulated Depreciation						($336,750,000)	($339,500,000)	($342,250,000)	($345,000,000)	($347,750,000)	($350,500,000)	($353,250,000)	($356,000,000)	
39	Less Deferred Tax Balance						($1,713,354)	($1,693,478)	($1,673,838)	($1,653,962)	($1,634,321)	($1,614,445)	($1,069,750)	$0	
40	Environmental Compliance Rate Base						$17,536,646	$14,806,522	$12,076,162	$9,346,038	$6,615,679	$3,885,555	$1,680,250	($0)	
41	Return on Environmental Rate Base						10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
42	Capital E(m)					PVRR $196,825,656	$1,753,665	$1,480,652	$1,207,616	$934,604	$661,568	$388,555	$168,025	($0)	**$404,186,038**
43															
44	Operating Expenses per cu yd		$ 12.47			Inflation									
45	Operating Expenses Net (75%)		$ 9.35	cu yd		2.50%	$0	$0	$0	$0	$0	$0	$0	$0	
46	Annual Depreciation						$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	**$342,250,000**
47	Annual Property Tax Expense						$33,000	$28,875	$24,750	$20,625	$16,500	$12,375	$8,250	$4,125	
48	Total Operating E(m)					PVRR $153,649,957	$2,783,000	$2,778,875	$2,774,750	$2,770,625	$2,766,500	$2,762,375	$2,758,250	$2,754,125	**$434,447,867**
49	Total Capital + Operating E(m) CCR to Landfill					**PVRR $350,475,613**	$4,536,665	$4,259,527	$3,982,366	$3,705,229	$3,428,068	$3,150,930	$2,926,275	$2,754,125	**$836,481,152**
50	**All in Annual Cost per Cubic Yd**						**$29.63**	**$27.82**	**$26.01**	**$24.20**	**$22.39**	**$20.58**	**$19.11**	**$17.99**	

1	**Revenue Requirments Summary - E(m)**			Net of IMPA/IMEA											
2	**Trimble CCR to Sterling Materials**						12/26/2063	12/25/2064	12/25/2065	12/25/2066	12/25/2067	12/24/2068	12/24/2069	12/24/2070	Total
51	Assumed Cubic Yards		153,109	Yr b/w Dates	910,000										
52	Phase I Commence Date		1/1/2018	9	8,190,000										
53	Phase II In Service Date		1/1/2027	7	6,370,000										
54	Phase III In Service Date		1/1/2034	11	10,010,000										
55	Phase IV In Service Date		1/1/2045	9	8,190,000										
56	End of 37 Years		1/1/2054	36	33,670,000										
57	Cummulative Cu Yd to begin Phase II				4,549,999										
58	Cumulative Cu Yd to begin Phase III				13,947,563										
59	Cumulative Cu Yd to begin Phase IV				24,416,890										
60		1	Depreciation Year				46	47	48	49	50	51	52	53	
61	Sterling		Book Depreciation Years		37		$0	$0	$0	$0	$0	$0	$0	$0	$178,617,500
62			Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$178,617,500
63			Difference				$0	$0	$0	$0	$0	$0	$0	$0	
64			Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
65			Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	($0)
66			Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	
67			MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	
68															
69			Depreciation Year				46	47	48	49	50	51	52	53	
70	Phase 1		Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$295,500,000
71			Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$295,500,000
72			Difference				$0	$0	$0	$0	$0	$0	$0	$0	
73			Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
74			Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0
75			Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	
76			MACRS Tax Depreciation Rate												
77															
78			Depreciation Year				15	16	17	18	19	20	21	22	
79	Phase 2		Book Depreciation Years		22		$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$2,750,000	$60,500,000
80			Tax Depreciation		20		$2,699,510	$2,698,905	$2,699,510	$2,698,905	$2,699,510	$2,698,905	$1,349,755	$0	$60,500,000
81			Difference				$50,490	$51,095	$50,490	$51,095	$50,490	$51,095	$1,400,245	$2,750,000	($4,302,925)
82			Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
83			Deferred Tax				$19,641	$19,876	$19,641	$19,876	$19,641	$19,876	$544,695	$1,069,750	($1,673,838)
84			Accumulated Deferred Tax Balance				($1,713,354)	($1,693,478)	($1,673,838)	($1,653,962)	($1,634,321)	($1,614,445)	($1,069,750)	$0	
85			MACRS Tax Depreciation Rate				4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%	0.000%	
86															
87			Depreciation Year				0	0	0	0	0	0	0	0	
88	Phase 3		Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0
89			Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0
90			Difference				$0	$0	$0	$0	$0	$0	$0	$0	$0
91			Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
92			Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0
93			Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	
94			MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	
95															
96			Depreciation Year				0	0	0	0	0	0	0	0	
97	Phase 4		Book Depreciation Years		22		$0	$0	$0	$0	$0	$0	$0	$0	$0
98			Tax Depreciation (20yr MACRS unless life < 20yrs)		20		$0	$0	$0	$0	$0	$0	$0	$0	$0
99			Difference				$0	$0	$0	$0	$0	$0	$0	$0	
100			Rate				38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	38.9%	
101			Deferred Tax				$0	$0	$0	$0	$0	$0	$0	$0	
102			Accumulated Deferred Tax Balance				$0	$0	$0	$0	$0	$0	$0	$0	
103			MACRS Tax Depreciation Rate				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	