Phase 2 Evaluation and Engineering Assessment and Golf Course Renovation

Harry L. Jones Sr. Golf Course

Ratcliffe Golf Services, Inc.
800 Radio Road
Charlotte, North Carolina 28216

02217302.00 | October 2, 2018

SCS ENGINEERS P.C.
2520 Whitehall Park Drive, Suite 450
Charlotte, NC 28273
704-504-3107

Table of Contents

Figures

Appendices

1 INTRODUCTION AND BACKGROUND

Mecklenburg Park and Recreation Department has determined that significant issues are affecting the operation of one of their public golf facilities, the Harry L. Jones, Sr. Golf Course located at 1525 W. Tyvola Rd., Charlotte, NC 28217. They have directed Ratcliffe Golf Services (Ratcliffe), the firm contracted with managing the property, to move forward with an evaluation to determine the best course of action for the facility. Ratcliffe retained SCS Engineers, PC to provide engineering services, Ron Garl Golf Design to serve as golf course architect, and. JJKeegan+ to conduct a financial analysis of each alternative proposed in the study.

This report, Phase 2 Evaluation and Engineering Assessment and Golf Course Renovation, was prepared by SCS Engineers, Ron Garl Golf Design and JJKeegan+. This report provides following:

- A summary of our field investigation activities
- Results from our drilling program
- An engineering approach to mitigate settlement due to waste decomposition
- Permitting requirements
- Proposed golf course renovation design
- Construction cost estimates
- Summary of the JJKeegan+ financial feasibility analysis
- Discussion and proposals for next steps (Phase III).

BACKGROUND

The Harry L. Jones Sr. Golf Course (formerly named Renaissance Park Golf Course) is located at 1525 West Tyvola Road in Charlotte North Carolina. The course is owned by the City of Charlotte (City) and managed by the Mecklenburg County Parks and Recreation Department (MCPR). The golf course was designed by golf course architect Mike Hurdzan and built in 1986.

Prior to redevelopment of the property as a golf course, the site was a municipal solid waste disposal facility known as the York Road Landfill. The City operated the landfill from approximately 1968 to 1986. Approximately 6 million tons of waste are reported to have been disposed at the landfill[1]. No waste has been removed from site to our knowledge and it was closed and capped in 1987. The waste disposal operations have been reported by others as occurring in six areas, referred to as Area A through Area F. Based on the historical disposal limits, approximately 128 acres of the site was used for landfilling activities. According to Ref. #1 cited below, a geomembrane liner was installed below the greens.

PHASE 1 REPORT OVERVIEW

Ratcliffe Golf Services, Inc. retained SCS Engineers to conduct an initial assessment of the Renaissance Park Golf Course in support of a potential significant course renovation project. The focus of our Phase 1 work was to confirm the extent of impact of landfill-related settling on the golf course design and course operations, and outline a course of action to determine the impact that existing landfill disposal areas would have on any renovation project.

[1] Article titled “Garbage to Golf: Too Much Trash? Too Little Golf”, Schmidt, Edward, Jr. (Golf Journal: Official Publication of the United States Golf Association, pp. 35-38; Jan-1991.

The Phase 1 Report (titled "Preliminary Evaluation and Engineering Assessment Renaissance Park Golf Course", August 2017) provided a summary of our initial site assessment and discusses recommendations for addressing proposed improvements to golf course. The primary objective during Phase 1 was to develop an overall Existing Conditions Site Plan that depicts current site conditions overlaid on key golf course features and to gather information on the history of landfilling activities.

PHASE 2 REPORT OVERVIEW

SCS Engineers was retained to gather additional site-specific information regarding waste depths and waste limits, provide preliminary engineering and settlement analyses, and develop conceptual construction cost estimates for various options. These options included closing the golf course. Phase 2 assignments covered geotechnical and civil engineering evaluations to allow development of conceptual remedial designs that specifically address waste settlement (short and long term), stormwater management, and biogas management in landfilled areas.

Specific items covered during our Phase 2 assignments included the following:

- Preparation of a Work Plan that describes drilling activities to assess waste depth and limits of waste at critical locations, and general characteristics of the waste (appearance, moisture, degree of decomposition, composition).
- Subcontract with a drilling company to drill 17 boreholes.
- Update the Site Plan with new topography (provided by others).
- Develop a soil surcharge (preloading) approach to stabilize waste in certain areas, and associated costs and schedule for typical fairway remedial repair(s). Prepare memorandum with figures and standard details.
- Evaluate suitability and costs of other ground improvement methods including Rapid Impact Compaction (RIC), Deep Dynamic Compaction (DDC) and geopiers, and to develop preliminary cost estimates.
- Estimate landfill post closure costs if the golf course was closed instead of redeveloped.
- Develop preliminary construction costs estimates for soil surcharging, use of geogrids for soil fill placement, and installation of impervious flexible membrane liners (FML) for tees and greens to minimize the effects of methane gas.
- Provide recommendations for further investigations to support the golf course renovation design.
- Develop a preliminary Master Plan for potential redevelopment of the golf course, taking into consideration the current site conditions and potential mitigation steps necessary to address landfill-related issues. Ron Garl Golf Design headed the development of this Master Plan with input from SCS Engineers as well as JJKeegan+.
- A long-term financial evaluation of three proposed remediation strategies for the site, taking into consideration the estimated costs associated with each, the current revenue

realized at the course and projections of future income based on potential renovation work.

2 DRILLING PROGRAM

On December 4, 5, and 6, 2017 seventeen (17) borings where drilled at the site. SCS subcontracted SAEDACCO to conduct the drilling. A track mounted auger-type drill rig was used to advance 4-inch diameter hollow stem auger holes to measure waste depth and observe waste characteristics at key locations on the course/landfill. Prior to drilling, SCS prepared a Work Plan. A copy of the work Plan is included in **Appendix A**.

A site plan showing the boring locations, description of the waste encountered, and depth of boring is provided in **Appendix A**. Waste was encountered in twelve (12) of the 17 locations.

In general, the waste encountered appeared to be highly decomposed, wet, and lacking organic materials. This is indicative of mixed organic municipal solid waste (MSW) more than about 30 years old. Waste cuttings from the borings were collected and transported to the Republic Services' Charlotte Motor Speedway landfill in Concord, North Carolina for disposal in a lined permitted MSW landfill.

Prior to transporting the waste cuttings, samples were collected and shipped to Shealy Environmental Services, Inc. and testing per the requirements of Republic Services. The following tests were run on the waste cuttings:

- EPA Method 8260B – Toxicity Characteristic Leaching Potential (TCLP) Volatiles.
- EPA Method 8270D – TCLP Semi-volatiles
- EPA Method 8081B – TCLP Pesticides
- EPA Method 6010D – Metals
- EPA Method 8151A – TCLP Herbicides
- EAP Method 8082A – TCLP Polychlorinated biphenyl (PCB)

Copies of the analytical test results and disposal manifest are provided in **Appendix A**.

3 SOIL SURCHARGE ANALYSIS

OVERVIEW

Surcharging is widely used and reliable method of improving soft ground conditions, including for landfilled waste. The surcharge process involves placing several feet of soil across a surface or area to surcharge (pre-load) and compress the waste over time. The surcharge remains in place for a period of time (6 to 12 months, more or less) depending on the compressibility properties of the waste and the depth. The weight (height) of the soil surcharge is selected to be high enough to compresses the underlying soft soil or waste such that when the surcharge is removed, the potential for future settlement is within tolerable limits.

The height of the surcharge, and lateral extent, are functions of the proposed loads and tolerable rate and magnitude of future settlement. Typical guidance is for a surcharge loading (pressure) to be equal to 1.0 to 2.0 times the planned pressure of the new structure (load), depending on the type of structure and acceptable level of post-construction settlement. The surcharge remains in place until the rate of settlement is reduced to a magnitude deemed suitable for the structure.

An important advantage of surcharging over the other methods is that monitoring of settlement rates can be performed using basic survey methods and becomes an integral as part of the method. Monitoring allows the engineer to track the progress of settlement and make quantitatively based predictions as to when the surcharge may be removed and how much potential for settlement remains in the future. Typically, the initial rate and magnitude of surcharge-induced settlement will be relatively large; however, as time passes, the rate and magnitude will be reduced and eventually begin to level off. The disadvantage of surcharging is the time to complete the surcharge is not known until several sets of readings are available, and cost of bringing in and removing fill may be high in areas where fill is costly, or not readily available near the site.

TYPICAL SOIL SURCHARGE APPROACH

For executing a surcharge approach to stabilizing old landfilled areas, the following steps are recommended:

1. Surcharge Area Delineation: Delineate the physical limits of the surcharge area by field survey; place stakes or markers as needed to guide the earthwork contractor. In general, the outer edge of the surcharge (defined as the toe of the surcharge slope) should extend up to about 10 feet beyond the limits of the area designated for surcharging.

2. Site Preparation: Prepare the area selected for surcharge by installing silt fence as required by regulation, strip and grub surface vegetation including grasses, brush, trees and large roots that may be present. Stockpile stripped vegetation for subsequent reuse. If not removed, vegetative and organic materials will decompose and generate methane gas over time and create a potentially weak horizontal layer. The prepared surface area should be graded, and surface compacted to allow for drainage and as necessary to accommodate final design grades.

3. Pre-Surcharge Survey and Settlement Plate Installations: After the site limits have been established and site prepared, and before placement of surcharge material, the area should be surveyed for elevation and a topographic map prepared for the record. Settlement plates

should be placed at that time and it is critical that they be surveyed for location and elevation to establish baseline conditions.

See Figure 1 for a typical settlement plate detail. Both the bottom plate and top of the metal rod for each settlement plate should be surveyed at the beginning. After surcharging begins, only the top metal rod requires surveying. The selected surveyor should establish at least one elevation bench mark located completely off of the site and which will not be impacted by the surcharge or landfill settlement, and use that benchmark for all surveying. To the extent possible, the same survey crew and equipment also be used to minimize data noise.

The number and location of settlement places is shown on the design drawings. In general, a sufficient plate will be located within surcharged areas to allow for measurement of settlement (i.e., waste compression) over the full period of the surcharge, and allow for making future settlement predictions. It is important to anticipate that up to about half of the settlement plates may be damaged or destroyed by natural or man-made forces during the surcharge period, and the total number of plates installed should take that into account.

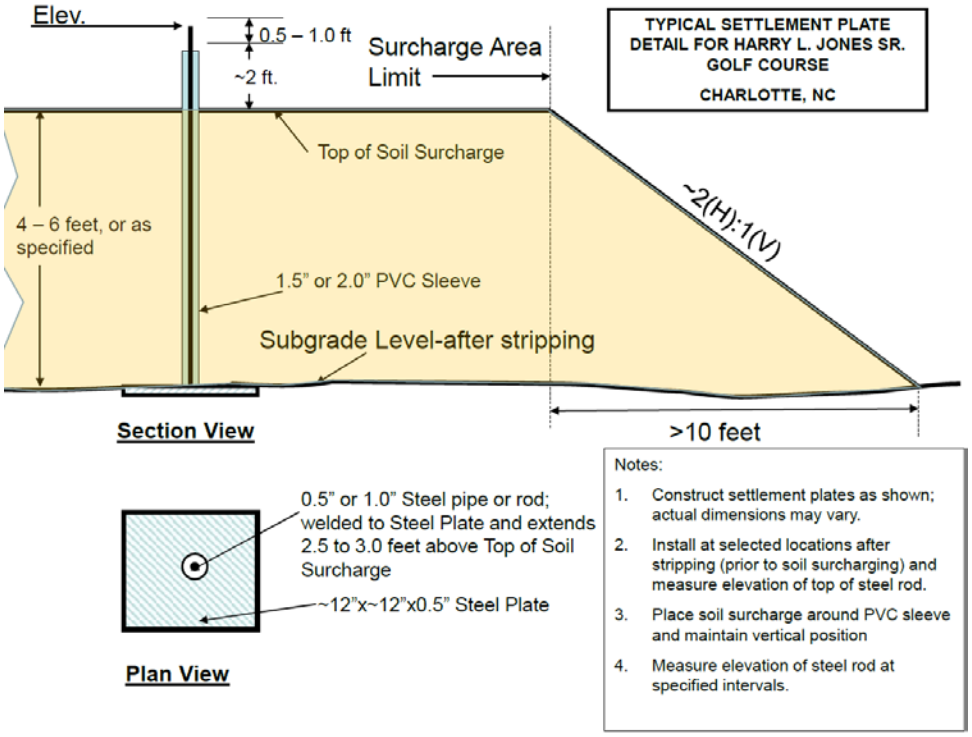


Figure 1. Typical Settlement Plate Details

4. Surcharge Placement: On-site stockpiled soil designated for surcharging shall be placed within the designated limits and to the desired thickness using conventional earthmoving equipment. Surcharge soil should primarily be inorganic, unsaturated, and unfrozen. As the lowermost one foot or more of the surcharge soil may remain in place and form part of the subgrade for future turf, tee boxes and green areas, special care should be taken to selecting suitable material. While compaction of the surcharge material is not essential, the material shall be placed in maximum 2 to 3 foot lifts so as to minimize the potential for voids

and to maximize the total weight of the surcharge. Field density testing is also not required, but the engineer and contractor should provide estimates of the weight of material placed.

5. Settlement Plate Monitoring: As noted in step 3, it is critical that each settlement plate be surveyed prior to placement of surcharge material to establish baseline conditions and that settlement plate readings be performed using the same equipment and methods from the beginning. Surveys should be performed to within 0.01 feet accuracy or about 1/8 inch. Readings should be taken at approximately the following intervals:

    - Initial (baseline) readings prior to placement of surcharge material
    - One to two weeks after completion of surcharge placement
    - Four weeks after completion of surcharge placement
    - Quarterly (12 week) intervals thereafter or until elevation change are within limits established by engineer.

6. Settlement Plate Data Evaluation: Survey information should be tabulated on a spreadsheet and provided to the engineer for evaluation. The information shall include the following:

    - Settlement plate number and coordinates (location)
    - Initial (baseline) elevation of base plate and top metal rod
    - Date of survey, weather, equipment and crew designation
    - Bench mark identification
    - Elevation of top of rod (base plate is covered up)
    - Comments (condition of settlement plate, distortion, damage, etc.)

    During the surcharge period, the engineer will be evaluating the data and creating graphs depicting settlement versus time as shown on Figure 2.

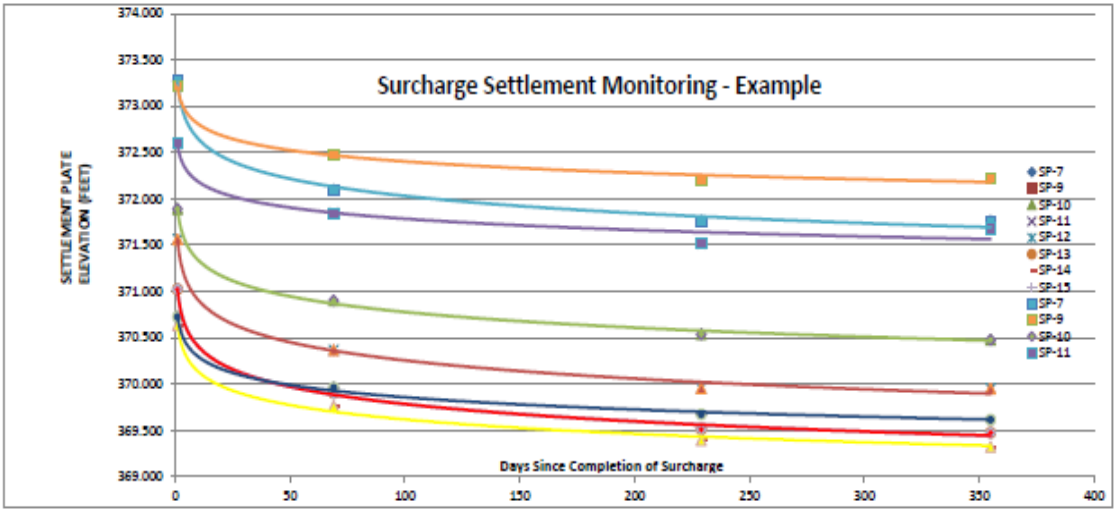


Figure 2. Surcharge Settlement Monitoring Example

7. Surcharge Removal: Based on the trends of settlement, design goals and other factors, the engineer will prepare a report describing the results of the surcharging and recommendation for removal and regrading of the area.

CART PATHS

The existing cart paths at the course have been deteriorating for several years due to settlement and poor drainage. It is planned that new cart paths for the course renovation will be engineered to minimize the effects of settlement. The following three options have been identified for stabilizing the subsurface for the new cart paths:

- Rapid Impact Compaction (RIC)
- Soil Surcharge
- Standard compaction equipment

Stabilizing the subsurface should cause settlement of 2 to 3 feet. Engineered fill will be placed and compacted and the use of geogrids will be explored (in Phase 3) to help spread the cart path loads. It is also possible that localized areas will require waste removal to further aid in stabilizing the subsurface. Further evaluation for cart paths will be explored during the final engineering and design phase.

4 SOIL STOCKPILE ASSESSMENT

The soil stockpile, which was placed between 2013 and 2014, is located west of Hole No. 5 alongside Sugar Creek. As stated above, the stock pile contains approximately 240,000 cubic yards of soil. The footprint of the stockpile is about 15 acres and is situated over landfilled areas.

During our site reconnaissance, SCS personnel examined portions of the stockpile. Overall, there is a good vegetative cover that includes young poplar trees, brush, and woody plants. The top area and slopes were viewed and overall the condition of the vegetative cover was suitable and surface erosion was minimal. The terraces on the northwest side of the stockpile appear intact, did not exhibit obvious signs of instability, and storm water pipes were in-place. The southern toe of slope, which is heavily vegetated, was also examined. There were no obvious signs of slope instability, sloughing, excess erosion, exposed waste, or landfill leachate seepage.

The overall slope of the stockpile sides range from 4 horizontal to 1 vertical (4H:1V) to 2.2H:1V. Slopes between terraces on the west side are in the 1.5H:1V. Although the slopes appear steep, the addition of the terraces flatten out the overall slope. These slopes are similar to those at the end of the driving range which have been in place for years.

SCS recommends removing some of the soil from the stockpile to flatten the overall slope to a 3H:1V range. Furthermore, a slope stability analysis should be performed during the Phase 3 engineering evaluations.

In addition to the site reconnaissance, SCS reviewed historical data from groundwater monitoring wells in the vicinity of the soil stockpile before and after the soil stockpile was placed (*Semi-Annual Monitoring Report, First Half 2018, Former York Road Landfill, Geosyntec, May 2018*). The groundwater wells reviewed included: YRW-10C, DDW-01, DDW-01A, DDW-02. Based on our review, the placement of the soil stockpile caused no impact to groundwater quality. We also reviewed the four methane gas probes in the vicinity of the soil stockpile (#32, 33, 34, and 35). Methane gas was not detected in any of these probes.

The material in the stockpile is an asset and should be used for filling and grading when mitigating the landfill settlement issues. Based on the information reviewed to date, there appears to be no adverse conditions caused by the soil stockpile.

5 PERMITTING REQUIREMENTS

The York Road Landfill was closed in 1987 according to available records. The City of Charlotte, which owns the landfill, is responsible for environmental monitoring (groundwater, methane gas migration, and cover integrity) at the landfill.

The following notifications should be made prior to any construction at the site:

- Notify the City of Charlotte, Environmental & Property Management. Since the City of Charlotte is the owner of the landfill all permit applications and agency notifications should be reviewed by the City.

- North Carolina Department of Environmental Quality (NCDEQ), Energy, Mineral and Land Resources, Mooresville office for Erosion and Sediment Control permitting.

- North Carolina Department of Environmental Quality (NCDEQ), Solid Waste Section, Asheville office.

SCS recommends coordinating all agency notifications with the City of Charlotte. Furthermore, we recommend meeting with NCDEQ early during the Phase 3 portion of the project to present the overall concept and discuss permitting strategies.

6 PROPOSED GOLF COURSE RENOVATION BY RON GARL GOLF DESIGN

OVERVIEW

Ron Garl Golf Design was tasked with developing a Master Plan along with refining preliminary cost estimates for both a nine-hole renovation and eighteen-hole renovation. This project presented unique challenges in that it not only needed to address design elements that would make the golf course more appealing to the market it served, it needed to simultaneously address the specific landfill settling issues that have decimated the existing golf course.

The first step in this process was to develop a concept or overriding theme of the course that provided an experience that fulfilled the recommendations outlined in the study provided by JJKeegan+. Once that was defined, design work began on the overall Master Plan by focusing on specific holes for particular areas of the property. These holes needed to be carefully researched and designed in order to accommodate the existing topography as well as possible, while providing the opportunity to increase fill to accommodate the soil surcharge and removal with the least amount of time and expense. The final result is a unique and extremely promising golf course design that will have a wide appeal to the golfing public, and not only greatly improve the golfer experience, but contribute to the overall community and image of Charlotte and Mecklenburg County as well.

COURSE DESIGN – THE THEME: THE JOURNEY WITH HARRY L. JONES, SR. GOLF COURSE

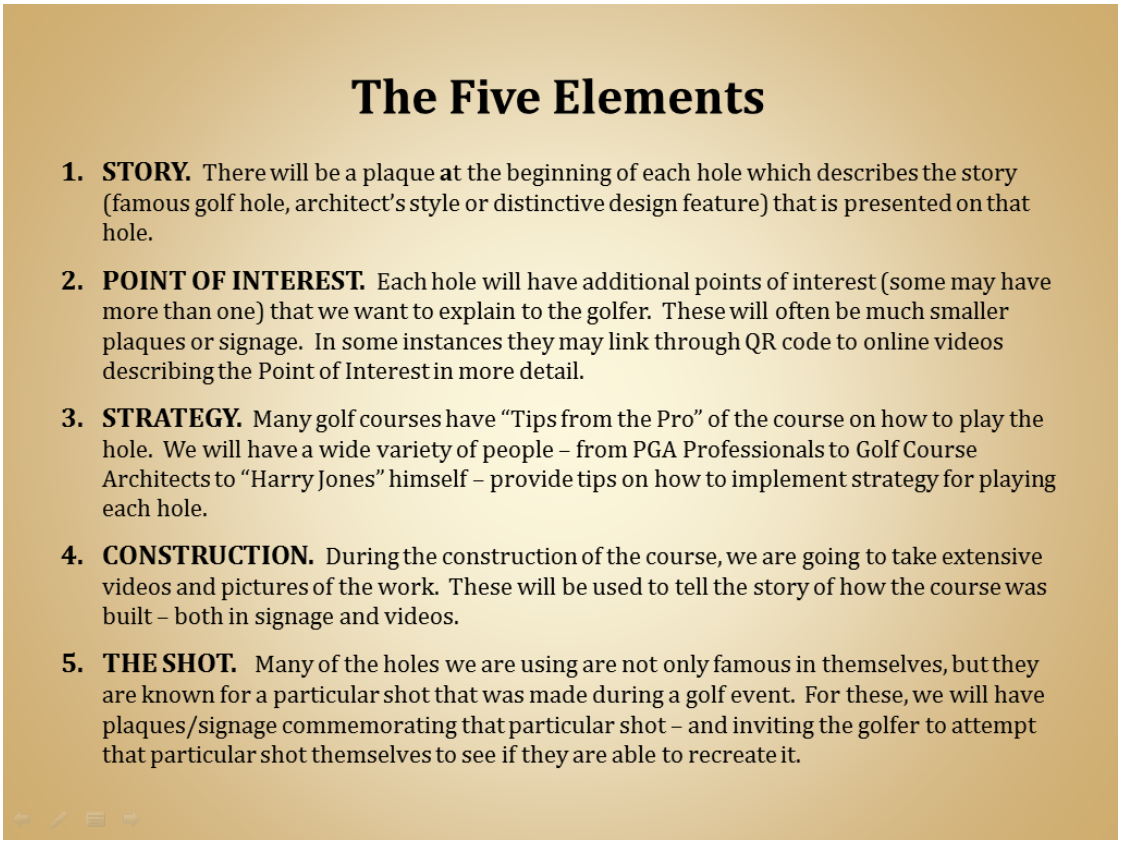
Ron Garl has designed over 250 golf courses around the world, and has an industry wide reputation for building facilities that garner unique attention and wide-spread accolades. Tiger Wood's first win on the PGA Tour was at a Ron Garl design, as was his first International win. In analyzing the opportunity at the Harry L. Jones, Sr. Golf Course, Ron immediately recognized his challenge; he said "When a golfer comes to Charlotte, they currently say 'I wish I could play at the Quail Hollow Club'. When we get through with this course, they will say 'I wish I could play at the Harry L. Jones, Sr. Golf Course.'"

Fulfilling that goal in the design process required a multi-pronged approach. First, in response to the market research conducted by JJKeegan+, the course design was softened to make it more appealing to a wide range of golfers. Forced carries (which require a golfer to hit a shot over an obstacle such as a creek or lake) were removed as much as possible. Holes were shortened. Blind shots were removed.

Secondly, an overall theme was adopted in the design which focused on creating a golf *experience* rather than just providing a golf course to play. This went so far as to propose a slight alteration in the name of the facility, to The Journey with Harry L. Jones, Sr. Golf Course. In the new design, a golfer will not just be playing a golf course – they will be embarking on a Journey through golf course history and design, hosted by Harry L. Jones. This unique approach has never been done in this manner, and has an incredible appeal to golfers of all skill levels.

The underlying principle of this theme is that every hole tells a story. It may be inspired by a famous Golf Course Architect or one of his holes or a famous shot or a famous design feature that has been successfully used in the past. As the golfer plays the course, they learn about these stories, about

even about their own approach to the game of golf. The story of each hole is conveyed through as many as five elements:



THE DESIGN – THE MASTER PLAN

Once the theme was established, the task of designing a course that incorporated the five story elements into each hole began. This required hundreds of hours of research to find the right fit for each particular hole. First, the hole needed to fit within the overall routing plan for the property, as well as being suitable for the topography that existed before and after addressing the landfill settling issues. The hole needed to be significant enough in golf history to accommodate the five elements of the story. Ultimately one of the most critical considerations was making sure the hole would be a popular, fun hole for golfers to play.

The resultant Master Plan achieves the objectives set out in the initial meetings. It is a unique blend of holes with historically significant inspirations that will entertain golfers as well as inform them on a variety of topics that they probably did not fully understand. By using the five elements to tell the story, and basing each hole on an inspiration from a significant hole, person or even famous shot made in golf, the Journey with Harry L. Jones, Sr. Golf Course will be a "must play" golf course for every golfer in Charlotte, as well as those that travel to this area.

Appendix B. – Master Plan for The Journey with Harry L. Jones, Sr. Golf Course

7 COST ESTIMATES

GOLF COURSE CLOSURE

A cost estimate was prepared by SCS to address the long-term post-closure activities associated with the landfill if the golf course was closed. The post-closure cost estimate includes mowing, cover restoration, and reseeding. The cost for groundwater and methane probe monitoring were not included in this cost estimate since the City is required to conduct these regardless of the course status. The post-closure cost estimate is provided in **Appendix C, Attachment C-1**.

GOLF COURSE RENOVATION COST ESTIMATE

Two preliminary construction cost estimates were prepared to address the full 18-hole renovation of the golf course. Preliminary costs related to the golf course renovation (tees, greens, cart paths, irrigation system, grassing, bunkers, etc.) were prepared by Ron Garl Golf Design. This estimate is provided in **Appendix C, Attachment C-2**.

Cost related to the engineering challenges for the course renovation where prepared by SCS Engineers. These costs include, but not limited to, the following:

- RIC for portions of the cart paths to improve subsurface conditions
- Synthetic liners under tees and greens to protect from methane gas intrusion
- Soil surcharging to improve subsurface conditions.
- Surveying and monitoring of the soil surcharges during construction
- Geogrid reinforcement for cart path to improve stability and reduce differential settlement

The cost estimates along with key assumptions are provided in **Appendix C, Attachment C-3.**

Both construction cost estimates will be refined/updated during the development of the Final Construction Drawings and Specifications (Phase 3).

8 FINANCIAL PROJECTIONS AND FEASIBILTY ANALYSIS

OVERVIEW

JJKeegan+ was retained to perform an in-depth study of the Harry L. Jones, Sr. Golf Course operation, including a market evaluation of each of three possible courses of action regarding the property.

Utilizing a state-of-the-art analytic approach to demographics within a 10-mile radius of the property, JJKeegan+ founder Jim Keegan used cost estimates provided by SCS Engineers and Ron Garl Golf Design to analyze the potential return on investment of each proposed remedy.

The analysis included a site visit by Mr. Keegan, coupled with an extensive comparative market review where he visited the courses throughout the area considered to be competitors of the Harry L. Jones, Sr. Golf Course.

Mr. Keegan then conducted a Golfer Local Market Analysis utilizing the Mosaic profile of demographics within a 10-mile radius of the facility. These metrics yielded not only an extensive insight into the current demand for golf that exists in the study area, they provided guidance for the *type* of golf course that should be built in order to appeal to the widest range of potential customers in proximity to the course. This information was shared with Ron Garl Golf Design, who in turn incorporated the suggestions from Mr. Keegan's study into the Master Plan for the course.

For the financial return analysis, Mr. Keegan took into account the projected cost of each option and performed a study to determine the return on investment of each option. In the scenario where the course retained 9 holes and, in the scenario, where the course remained an 18 hole facility, he utilized existing revenue numbers and applied projections based on existing GLMA data, corrected for the suggested course improvements identified in the Mosaic profile analysis.

ANALYSIS: OPTION 1, CLOSE THE COURSE

The first potential course of action would be to simply close the course and allow the property to revert to the status of a closed landfill. This option entails certain one-time expenses of closure, and an annual maintenance of the property to meet post-closure permitting requirements. The financial analysis of this option was fairly straight-forward, requiring a totaling of expenses over the 30-year projected study period. The initial cost of preparing the course ($150,000), combined with the annual cost of maintenance over the 30-year period ($2,900,000) resulted in a net present-day loss of $1,777,280.

Just Closing the Landfill Makes No Sense

Total Input Capital	-$150,000
Accumulated Annual Return/Expense	-$2,900,000
Total Return	-$3,050,000
IRR	negative
Net Present Value	-$1,777,280

ANALYSIS: OPTION 2, CLOSE 9 HOLES, RENOVATE THE REMAINING 9 HOLES

The first nine holes, as well as a portion of the 10th and 18th holes, are on the former landfill. Thus, the bulk of the "back" nine (holes 10 through 18) are not on landfill. Thus, it is possible to mitigate further issues related to landfill settling by closing the front nine and renovating the second nine into a course consisting of only nine holes.

Mr. Keegan determined that this course of action would result in a slightly better return over the course of the study period, but there is one variable that could make the 9-hole renovation less appealing than simply closing the entire facility: the continued maintenance of the landfill portion of the property.

While some expenses of closing the landfill holes could be mitigated during the renovation of the back nine (for example, the need to decommission the irrigation would supposedly be handled in the new irrigation system installation), the ongoing expense of maintenance of the closed holes would present some type of recurring expense. This was not factored in due to the unknown nature of that expense, and how it would be handled in conjunction with the maintenance of the remaining 9 holes.

The financial analysis of this option resulted in a total net return over the 30-year period of $3,642,949, representing a net present-day value of $199,625.

The Nine Hole Generates Positive Net Present Value

But Doesn't Maximize Investment Return

	Close Landfill	9-Hole
Total Input Capital	-$150,000	-$3,732,237
Accumulated Annual Return/Expense	-$2,900,000	$7,375,186
Total Return	-$3,050,000	$3,642,949
IRR	negative	1.16%
Net Present Value	-$1,777,280	$199,625

ANALYSIS: OPTION 3, RENOVATE ALL 18 HOLES

The third and final option for addressing the issues facing the Harry L. Jones Golf Course is a complete renovation of all 18 holes. This process would entail addressing the existing conditions found on the landfill/golf course and providing for engineering and design solutions that would mitigate, offset or otherwise reduce the risk of future impacts due to landfill related settling and other issues resulting from having a public golf operation on a landfill.

Mr. Keegan utilized an array of tools he has developed to determine the potential revenue of the facility and extrapolated that out over the 30-year study period utilized in the analysis of the other options. Using the projected preliminary construction expense numbers from the Phase I study, he calculated that the total return over the study period would be $6,155,401. The resultant Net Present Value of the 18-hole renovation option was $606,513, leading to his conclusion that the renovation of the entire golf course was the most viable option from a financial analysis standpoint.

It is important to note that this analysis does not include any projections or considerations of the economic impact to the area if the amenity that the golf course represents to this community were to close and no longer be available for public use.

Renovating the 18-hole Golf Course Is Most Viable Option

	Close Landfill	9-Hole	18-Hole
Total Input Capital	-$150,000	-$3,732,237	-$5,694,109
Accumulated Annual Return/Expense	-$2,900,000	$7,375,186	$11,849,510
Total Return	-$3,050,000	$3,642,949	$6,115,401
IRR	negative	1.16%	1.64%
Net Present Value	-$1,777,280	$199,625	$606,513

9 CONCLUSION AND NEXT STEPS – PHASE III

It is the unanimous conclusion of the consultants that are a party to this report that action should be taken to remediate the problems at the Harry L. Jones Golf Course. In the current state, the impact of landfill settlement have rendered the golf course difficult to maintain to any reasonable standards. Secondary impacts caused by settlement affect drainage and irrigation of the golf course, which are further accelerating the settling of the landfill. Ponding water and other issues threaten the compliance with the closed landfill permit, and some areas of the property with direct access and exposure to the golfers present significant safety risk issues. If nothing is done, it is only a matter of time before an incident occurs that could result in serious injury to a user of the facility.

The study of potential corrective action for the Harry L. Jones Golf Course was originally intended as a five-phase process. This report concludes Phase II of that process, and at this point the project is yielding the desired objective, which was a refined, well-informed decision path for next steps.

Of the three potential options, the studies have indicated that the best course of action is to renovate the entire golf course. This not only is the best decision from the financial perspective of this specific property, there are intrinsic, passive benefits to the neighboring community as well. Allowing the property to revert to a static landfill will have a profound effect on the region surrounding the golf course. On the other hand, investing in a revitalization that promises to turn the current asset, which has a distinctly negative stigma, into a popular, well-perceived amenity to the area has immeasurable benefits.

It is the recommendation of this Phase II report that the governing bodies move to implement Phase III of the process, which is to develop working documents including Construction Drawings, Specifications and permitting for the renovation of the entire golf course. This phase would include finalizing the engineering, design, and procurement process to select a contractor or contractors to complete the renovation. The estimated timeline for Phase II would be approximately 9 months.

Phase IV, which would include actual construction, field engineering and construction administration, is expected to take approximately 24 months for completion.

The final step, Phase V, would entail post-construction maintenance and monitoring. In this phase, a Maintenance and Monitoring Plan would be developed. This Plan will establish inspection guidelines and procedures to ensure early detection and repair of problems caused by landfill settling. Phase V activities would be implemented throughout the life of the facility. Initially, it is anticipated that minimal output would be required to implement Phase V. However, long-term maintenance activities and repairs due to landfill settling are hard to predict at this time.

Appendix A

Work Plan Subsurface Investigation

SCS ENGINEERS

Work Plan
Subsurface Investigation
Harry L. Jones, Sr. Golf Course

Presented to:

Ratcliffe Golf Services, Inc.

800 Radio Road
Charlotte, NC 28216

Presented by:

SCS ENGINEERS, PC
2520 Whitehall Park Road, Suite 450
Charlotte NC, 28273

October 25, 2017
File No. 02217302.01

Environmental Consultants
and Contractors

2520 Whitehall Park Drive
Suite 450
Charlotte, NC 28273-3557

704 504-3107
FAX 704 504-3174
www.scsengineers.com

SCS ENGINEERS, PC

October 25, 2017
File No. 02217302.01

Mr. David Wolfe, P.E., ENV SP
Program Manager
Environmental Services
Engineering & Property Management
Charlotte, NC

Mr. Joseph S. Hack, QEP
Solid Waste Management
Mecklenburg County
2145 Suttle Avenue
Charlotte, NC 28208

Subject: Work Plan for Subsurface Investigation
Harry L. Jones, Sr. Golf Course

Dear Mr. Wolfe and Mr. Hack:

On behalf of Ratcliffe Golf Services, SCS Engineers present this Work Plan for the planned subsurface investigation at the Harry L. Jones, Sr. Golf Course. Our subsurface investigation includes borings and test pits to help define the depth and location of buried municipal solid waste at the course.

If you have any questions or require any additional information, please contact me at 704-504-3107 or at slamb@scsengineers.com.

Sincerely,

Steven C. Lamb, PE
Vice President
SCS ENGINEERS, PC

Robert H. Isenberg, PE, CPG
Senior Vice President
SCS ENGINEERS, PC

scl/rhi

cc: Del Ratcliffe, Harry L. Jones, Sr. Golf Course
Larry Frost, NCDEQ

Enclosures

Work Plan
Subsurface Investigation
Harry L. Jones, Sr. Golf Course

Presented To:

Ratcliffe Golf Services, Inc.
800 Radio Road
Charlotte, NC 28216

Presented From:

SCS ENGINEERS, PC
2520 Whitehall Park Drive, Suite 450
Charlotte, NC 28273

October 25, 2017
File No. 02217302.00

Table of Contents

Figures

1.0 INTRODUCTION AND BACKGROUND

The Harry L. Jones, Sr. Golf Course (formerly known as the Renaissance Park Golf Course) is located at 1525 West Tyvola Road in Charlotte North Carolina. The course is owned by the City of Charlotte (City) and managed by the Mecklenburg County Parks and Recreation Department (MCPR). Prior to redevelopment of the property as a golf course, the site was a municipal solid waste disposal facility known as the York Road Landfill.

Ratcliffe Golf Services, Inc. retained SCS Engineers to conduct an assessment of the course in support of a potential significant course renovation project. The assessment focused on the impact that existing landfill disposal areas would have on a renovation project. Phase 1 engineering assignments, which addressed overall conditions of the golf course, were completed earlier this year. Upcoming Phase 2 assignments include obtaining additional site-specific information regarding waste depths and waste limits in areas underlying tee boxes, fairways, greens and cart paths, as well as providing preliminary engineering and settlement analyses, and developing conceptual construction cost estimates for various remedial options.

This Work Plan describes the procedures to be followed during the field investigation activities under Phase 2 to establish depth of waste and waste limits at select locations.

2.0 SITE CONDITIONS

Harry L. Jones, Sr. Golf Course is situated on approximately 300 acres. The course is an 18 hole municipal golf course with a driving range and a par 3 learning center. Portions of the golf course are situated over top of the York Road Landfill, a closed municipal solid waste disposal facility.

SCS is coordinating our subsurface investigative work with Ratcliffe and Ron Garl Golf.

3.0 DRILLING AND TEST PIT PROGRAM

SCS will subcontract with a licensed drilling contractor to drill between 15 and 20 boreholes in pre-selected locations at the course. The boring locations were selected by Ratcliffe Golf, Ron Garl Golf and SCS Engineers and illustrated on **Figure 1**.

SCS Engineers personnel will field locate and stake all boring locations. A truck mounted rotary drill rig (or similar) will be used to auger and sample boreholes to the various depths as indicated below:

- Where waste is encountered, boring will extend 2 to 3 feet below the bottom of waste, into native soil.
- If no waste is encountered, borings will be up to 20 feet deep maximum.
- Per ASTM D1586, Standard penetration test (SPT) sampling and blow counts (N-values) will be performed at 5 to 10 foot depth intervals for select borings. Samples will be

inspected for moisture content, degree of decomposition and composition, both useful for evaluating future settlement. If hard or large obstructions are encountered, the sampling frequency or depth ranges may be amended.

Borings will be logged by the driller for types of materials encountered, depth of liquids, and other conditions, under observations of a representative of SCS Engineers. Soil drill cuttings may be disposed on site, but waste drill cuttings will need to be drummed separately, tested for presence of hazardous materials, and properly disposed of at the Republic Services Charlotte Motor Speedway Landfill in Concord. Records of testing and disposal will be maintained by SCS and provided to the City and County upon request.

All borings will be backfilled with a heavy bentonite slurry, or with bentonite pellets, up to 2 feet below ground surface. The final 2 feet of the borehole will be backfilled with clean, inorganic soil and the final surface of all disturbed area will be seeded or sodded by Ratcliffe Golf, as necessary to support vegetative growth.

Following the drilling program, or during, it is proposed to excavate test pits (and/or Geoprobe boreholes) at select locations to delineate the edge of waste, or waste boundary. Test pits will be excavated with a backhoe, excavator, or similar equipment that can reach depths of up to 6 to 8 feet. Test pits will be monitored and logged by SCS. All material excavated will be placed back into the test pit and compacted with the backhoe bucket. Just as for the borings, the final 2 feet will be backfilled with clean soil, compacted, and the surface restored.

All borings and test pit locations will be field surveyed for horizontal location (N/S and E/W coordinates) and mean sea level elevation. A final report will be prepared by SCS Engineers, following the completion of the field work. The final report will include a narrative of activities, summary of findings, boring and test pits logs, survey data, site plan, lab data and photographs.

4.0 HEALTH AND SAFETY

Drilling and test pitting work will occur within or in close proximity to municipal solid waste and within a zone of potential health and safety issues including methane and H2S gas emissions, leachate, organic and metallic waste and other disposed materials.

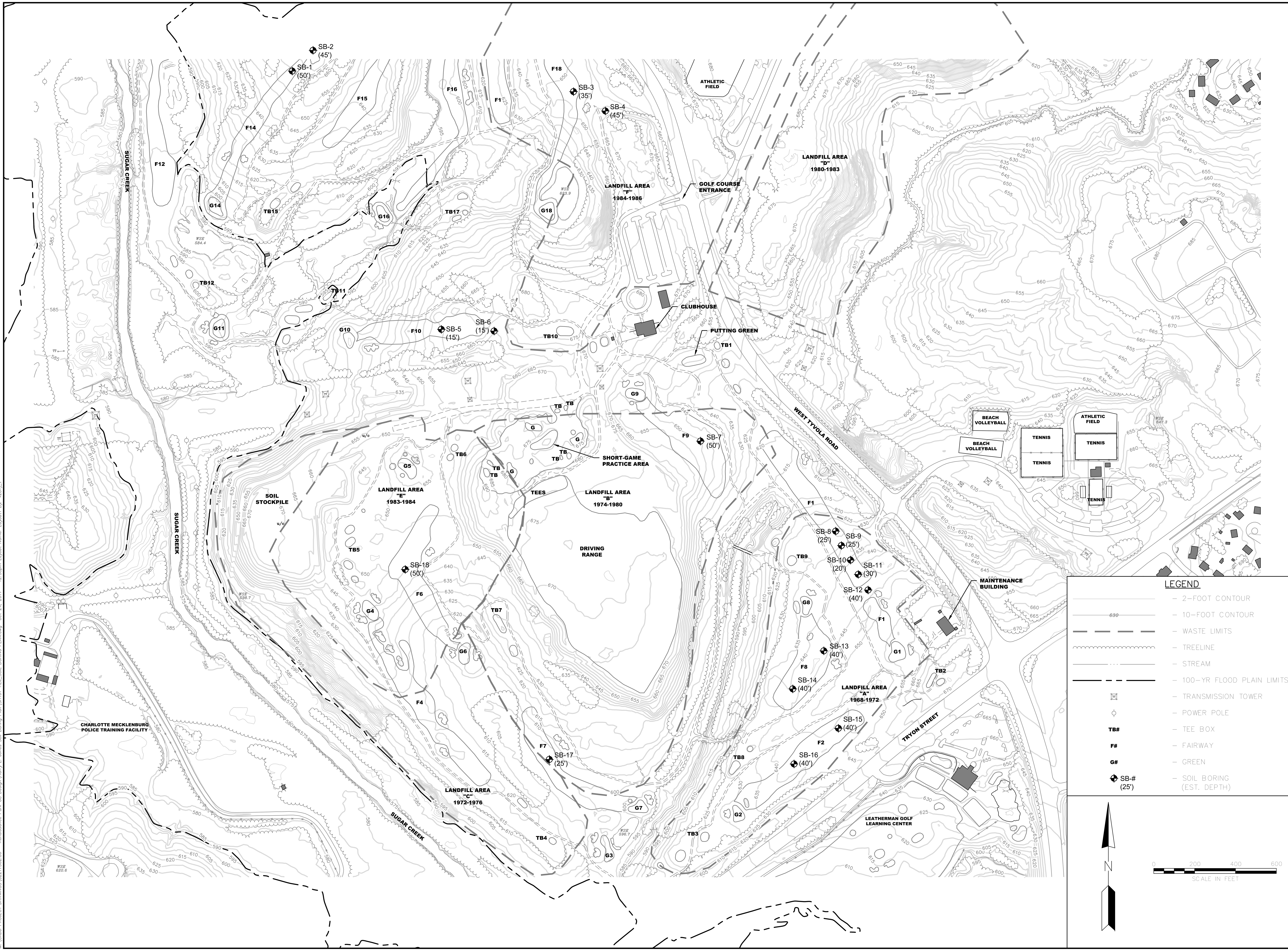
The Driller is responsible for site health and safety for its own employees and shall prepare a Site Health and Safety Plan, and provide a copy of this Plan to SCS Engineers for informational purposes only. The Site Health and Safety Plan shall be prepared in accordance with applicable provisions of OSHA regulations 29 CFR 1910.120 and 1926.

Prior to any drilling or test pit excavation, a tailgate safety meeting will be conducted at the course. Personal protective equipment (PPE) shall include hard hat, hearing protection, and safety boots. SCS will also have a gas meter to monitor atmosphere in the working zone.

5.0 PERMITTING

SCS Engineers reviewed of the City of Charlotte Erosion Control Requirements. The amount of land to be disturbed is less than one acre, therefore an erosion and sedimentation plan is not required. However, all efforts will be used to limit erosion during the subsurface exploration activities. In general, all boreholes and test pits will be backfilled immediately following their development. All disturbed areas will be re-seeded as needed.

SCS Engineers contacted Mr. Larry Frost, NCDEQ, Waste Management Solid Waste Section Permitting Branch and inquired about any permits or notifications that are required prior to drilling. Mr. Frost stated a permit from NCDEQ is not needed, however, they would like to review this Work Plan. A copy of this Work Plan was submitted to NCDEQ.



LEGEND

- 2-FOOT CONTOUR
- 630 — 10-FOOT CONTOUR
- WASTE LIMITS
- TREELINE
- STREAM
- 100-YR FLOOD PLAIN LIMITS
- TRANSMISSION TOWER
- POWER POLE
- TB# — TEE BOX
- F# — FAIRWAY
- G# — GREEN
- SB-# (25') — SOIL BORING (EST. DEPTH)

NO. | REVISION | DATE

SHEET TITLE
TEST BORING LOCATION PLAN

PROJECT TITLE
HARRY L. JONES, SR GOLF COURSE SITE ASSESSMENT

CLIENT
RATCLIFFE GOLF SERVICES, INC.
800 RADIO ROAD
CHARLOTTE, NC 28216

SCS ENGINEERS, PC
2520 WHITEHALL PARK DRIVE, SUITE 450
CHARLOTTE, NORTH CAROLINA 28273
PHONE: (704) 504-3107 FAX: (704) 504-3174

02217302.00 | TAS | ADC | SCL

CADD FILE: SHT01-HLJ...
DATE: OCTOBER 2017
SCALE: AS SHOWN
DRAWING NO.
01 of **1**

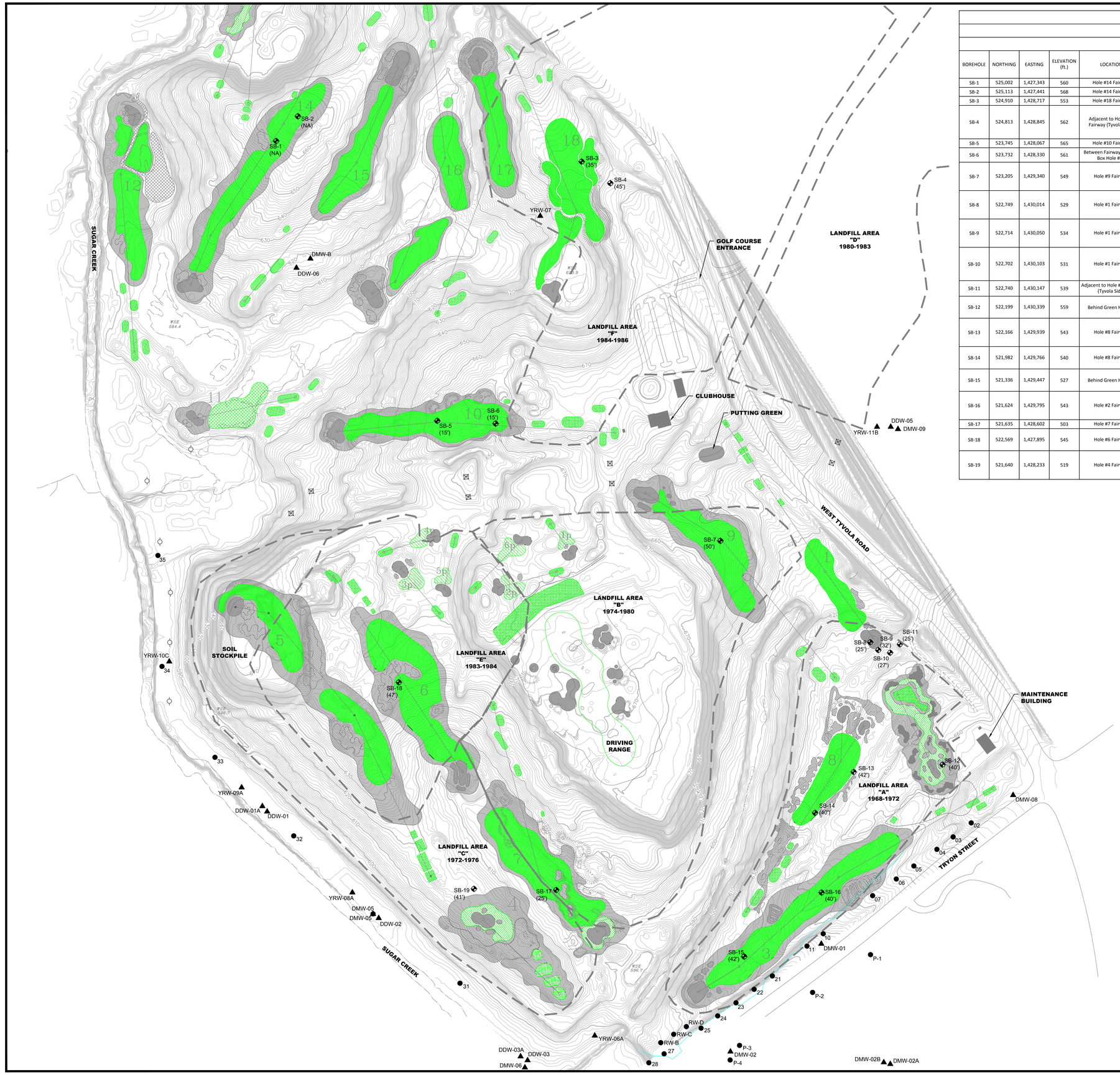
Soil Boring Results and Site Plan

HARRY L. JONES GOLF COURSE

TEST BORING RESULTS

DECEMBER 4th - 6th, 2017

BOREHOLE	NORTHING	EASTING	ELEVATION (ft.)	LOCATION	TOTAL BORING DEPTH (ft.)	DEPTH OF SOIL CAP (ft.)	DEPTH TO BOTTOM OF WASTE (ft.)	WASTE DESCRIPTION (MOISTURE, ODOR, TEXTURE)
SB-1	525,002	1,427,343	560	Hole #14 Fairway	NA	NA	NA	
SB-2	525,113	1,427,441	568	Hole #14 Fairway	NA	NA	NA	
SB-3	524,910	1,428,717	553	Hole #18 Fairway	35	35	NA	
SB-4	524,813	1,428,845	562	Adjacent to Hole #18 Fairway (Tyvola Side)	45	6	42	6'-22': mostly plastic netting, paper, wood debris, rubber, indiscernibles 22'-30': greyish indiscernible material, paper, plastics, rubber 30'-42': greyish indiscernible material, plastics, fabric 42'-45': little moist, greyish soil (NO WASTE) (Smelled like active face)
SB-5	523,745	1,428,067	565	Hole #10 Fairway	15	15	NA	
SB-6	523,732	1,428,330	561	Between Fairway and Tee Box Hole #10	15	15	NA	
SB-7	523,205	1,429,340	549	Hole #9 Fairway	50	5	50	5'-16': soil, plastics, rubber, wire, greyish indiscernibles 16'-21': moist soil, plastics, greyish indiscernibles 21'-50': wet "soupy" greyish/brown indiscernibles, plastics (NEVER OUT OF WASTE)
SB-8	522,749	1,430,014	529	Hole #1 Fairway	25	5	24	5'-8': greyish soil, plastics, fabric 8'-20': moist fabric, plastics, rubber hose 20'-24': wet greyish soil/indiscernibles, few plastics 24'-25': wet greyish soil (NO WASTE)
SB-9	522,714	1,430,050	534	Hole #1 Fairway	32	2	32	2'-15': wet grey soil, roots, some waste 15'-16': refusal at 16'; wet msw (roofing mat) 16'-32': wet msw, soil (NEVER OUT OF WASTE)
SB-10	522,702	1,430,103	531	Hole #1 Fairway	27	5	27	5': msw 10'-13': wet soil 13'-18': moist black msw 22'-27': wet msw mixed with soil (NEVER OUT OF WASTE)
SB-11	522,740	1,430,147	539	Adjacent to Hole #1 Fairway (Tyvola Side)	25	25	NA	
SB-12	522,199	1,430,339	559	Behind Green Hole #1	40	10	40	10'-30': moist soil, indiscernibles, mostly fabric 30'-40': wet soil, indiscernibles, fabric (NEVER OUT OF WASTE)
SB-13	522,166	1,429,939	543	Hole #8 Fairway	42	6	42	6'-12': few wood, plastics, greyish/brown indiscernibles 12'-27': wet "soupy" indiscernible material, plastics 27'-42': moist/"pasty" grey indiscernible material, plasitics, wire (NEVER OUT OF WASTE)
SB-14	521,982	1,429,766	540	Hole #8 Fairway	40	2	32	2'-16': greyish/black indiscernible material, plastics, wood material 16'-32': greyish/black "soupy" material, few plastics 32'-40': soil, moist to wet (NO WASTE)
SB-15	521,336	1,429,447	527	Behind Green Hole #2	42	10	42	10'-12': soil, plastics, indiscernibles 12'-42': wet "soupy" brownish soil/indiscernible material, plastics, fabric (NEVER OUT OF WASTE)
SB-16	521,624	1,429,795	543	Hole #2 Fairway	40	4	23	4'-13': plastics, few wood chips, mostly greyish soil/indiscernible material 13'-23': few plastics, mostly soil & indiscernible material 23'-40': soil, around 35' soil little moist, (NO WASTE)
SB-17	521,635	1,428,602	503	Hole #7 Fairway	25	25	NA	
SB-18	522,569	1,427,895	545	Hole #6 Fairway	47	5	47	5'-8': soil, plastics, cable, indiscernibles 8'-47': wet "soupy" greyishindiscernible material, plastics, fabric, wire (NEVER OUT OF WASTE)
SB-19	521,640	1,428,233	519	Hole #4 Fairway	41	2	39	2'-15': soil, greyish indiscernibles, plastics, fabric, rubber 15'-39': wet greyish "soupy" indiscernible material, few plastics 39'-41': wet "soupy" material (refusal) (Faint msw/lfg smell)



LEGEND

- 2–FOOT CONTOUR
- 630 – 10–FOOT CONTOUR
- WASTE LIMITS
- STREAM
- TRANSMISSION TOWER
- POWER POLE
- GROUNDWATER WELL
- METHANE PROBE
- SB-# (25') – SOIL BORING (BORED DEPTH)

NOTES:

BASE SOURCE MAP: LANDFILL SURFACE GRADES TAKEN FROM

0 225 450 900

SCALE IN FEET

N

DATE

REVISION

NO.

SHEET TITLE: SITE PLAN

PROJECT TITLE: HARRY L. JONES GOLF COURSE

CLIENT: RATCLIFFE GOLF SERVICES
800 RADIO ROAD
CHARLOTTE, NORTH CAROLINA 28216

SCS ENGINEERS, PC
2260 WITHERHILL PARK DRIVE, SUITE 450
CHARLOTTE, NORTH CAROLINA 28273
PHONE: (704) 504-3107 FAX: (704) 504-3174

DES. BY: IAS
DRN. BY: APS
CHK. BY: SCL
APP. BY: SCL
PROJECT NO.: 02217302.00

CADD FILE:

DATE: AUGUST

SCALE: AS SHOWN

DRAWING NO.: 01 of

M:\CADD PROJECT DRAWINGS\02217302.00 – Renaissance Park GC Design\HLJ – SITE PLAN V0.1.dwg Oct 02, 2018 – 1:03pm Layout Name: HLJ–SITE PLAN (ARCH E) By: 4281j_t

HARRY L. JONES GOLF COURSE

TEST BORING RESULTS

DECEMBER 4th - 6th, 2017

BOREHOLE	NORTHING	EASTING	ELEVATION (ft.)	LOCATION	TOTAL BORING DEPTH (ft.)	DEPTH OF SOIL CAP (ft.)	DEPTH TO BOTTOM OF WASTE (ft.)	WASTE DESCRIPTION (MOISTURE, ODOR, TEXTURE)
SB-1	525,002	1,427,343	560	Hole #14 Fairway	NA	NA	NA	
SB-2	525,113	1,427,441	568	Hole #14 Fairway	NA	NA	NA	
SB-3	524,910	1,428,717	553	Hole #18 Fairway	35	35	NA	
SB-4	524,813	1,428,845	562	Adjacent to Hole #18 Fairway (Tyvola Side)	45	6	42	**6'-22':** mostly plastic netting, paper, wood debris, rubber, indiscernibles **22'-30':** greyish indiscernible material, paper, plastics, rubber **30'-42':** greyish indiscernible material, plastics, fabric **42'-45':** little moist, greyish soil (NO WASTE) (Smelled like active face)
SB-5	523,745	1,428,067	565	Hole #10 Fairway	15	15	NA	
SB-6	523,732	1,428,330	561	Between Fairway and Tee Box Hole #10	15	15	NA	
SB-7	523,205	1,429,340	549	Hole #9 Fairway	50	5	50	**5'-16':** soil, plastics, rubber, wire, greyish indiscernibles **16'-21':** moist soil, plastics, greyish indiscernibles **21'-50':** wet "soupy" greyish/brown indiscernibles, plastics (NEVER OUT OF WASTE)
SB-8	522,749	1,430,014	529	Hole #1 Fairway	25	5	24	**5'-8':** greyish soil, plastics, fabric **8'-20':** moist fabric, plastics, rubber hose **20'-24':** wet greyish soil/indiscernibles, few plastics **24'-25':** wet greyish soil (NO WASTE)
SB-9	522,714	1,430,050	534	Hole #1 Fairway	32	2	32	**2'-15':** wet grey soil, roots, some waste **15'-16':** refusal at 16'; wet msw (roofing mat) **16'-32':** wet msw, soil (NEVER OUT OF WASTE)
SB-10	522,702	1,430,103	531	Hole #1 Fairway	27	5	27	**5':** msw **10'-13':** wet soil **13'-18':** moist black msw **22'-27':** wet msw mixed with soil (NEVER OUT OF WASTE)
SB-11	522,740	1,430,147	539	Adjacent to Hole #1 Fairway (Tyvola Side)	25	25	NA	
SB-12	522,199	1,430,339	559	Behind Green Hole #1	40	10	40	**10'-30':** moist soil, indiscernibles, mostly fabric **30'-40':** wet soil, indiscernibles, fabric (NEVER OUT OF WASTE)

HARRY L. JONES GOLF COURSE

TEST BORING RESULTS

DECEMBER 4th - 6th, 2017

BOREHOLE	NORTHING	EASTING	ELEVATION (ft.)	LOCATION	TOTAL BORING DEPTH (ft.)	DEPTH OF SOIL CAP (ft.)	DEPTH TO BOTTOM OF WASTE (ft.)	WASTE DESCRIPTION (MOISTURE, ODOR, TEXTURE)
SB-13	522,166	1,429,939	543	Hole #8 Fairway	42	6	42	**6'-12':** few wood, plastics, greyish/brown indiscernibles **12'-27':** wet "soupy" indiscernible material, plastics **27'-42':** moist/"pasty" grey indiscernible material, plasitics, wire (NEVER OUT OF WASTE)
SB-14	521,982	1,429,766	540	Hole #8 Fairway	40	2	32	**2'-16':** greyish/black indiscernible material, plastics, wood material **16'-32':** greyish/black "soupy" material, few plastics **32'-40':** soil, moist to wet (NO WASTE)
SB-15	521,336	1,429,447	527	Behind Green Hole #2	42	10	42	**10'-12':** soil, plastics, indiscernibles **12'-42':** wet "soupy" brownish soil/indiscernible material, plastics, fabric (NEVER OUT OF WASTE)
SB-16	521,624	1,429,795	543	Hole #2 Fairway	40	4	23	**4'-13':** plastics, few wood chips, mostly greyish soil/indiscernible material **13'-23':** few plastics, mostly soil & indiscernible material **23'-40':** soil, around 35' soil little moist, (NO WASTE)
SB-17	521,635	1,428,602	503	Hole #7 Fairway	25	25	NA	
SB-18	522,569	1,427,895	545	Hole #6 Fairway	47	5	47	**5'-8':** soil, plastics, cable, indiscernibles **8'-47':** wet "soupy" greyishindiscernible material, plastics, fabric, wire (NEVER OUT OF WASTE)
SB-19	521,640	1,428,233	519	Hole #4 Fairway	41	2	39	**2'-15':** soil, greyish indiscernibles, plastics, fabric, rubber **15'-39':** wet greyish "soupy" indiscernible material, few plastics **39'-41':** wet "soupy" material (refusal) (Faint msw/lfg smell)

Waste Cutting Disposal and Lab Results

SHEALY ENVIRONMENTAL SERVICES, INC.

Report of Analysis

SCS Engineers
2520 Whitehall Park Drive #450
Charlotte, NC 28273
Attention: Steve Lamb

Project Name: Ratcliff E. Golf, REN. PARK GC DESIGN

Project Number: 02217302.00

Lot Number:**TB08087**

Date Completed:02/20/2018

N. Saikaly

02/28/2018 12:16 PM
Approved and released by:
Project Manager: Nisreen Saikaly

The electronic signature above is the equivalent of a handwritten signature.

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Case Narrative
SCS Engineers
Lot Number: TB08087

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W" qualifier

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Summary
SCS Engineers
Lot Number: TB08087

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	HJGC	Solid	02/08/2018 1049	02/08/2018

(1 sample)

Detection Summary

SCS Engineers

Lot Number: TB08087

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	HJGC	Solid	SGT - HEM (non-polar	9071B	1100		mg/kg	5
001	HJGC	Solid	Aroclor 1242	8082A	1.3		mg/Kg	8
001	HJGC	Solid	Aroclor 1254	8082A	0.34		mg/Kg	8
001	HJGC	Solid	Arsenic	6010D	0.027	J	mg/L	11
001	HJGC	Solid	Barium	6010D	0.94		mg/L	11
001	HJGC	Solid	Chromium	6010D	0.036	J	mg/L	11
001	HJGC	Solid	Lead	6010D	0.15		mg/L	11

(7 detections)

Inorganic non-metals

Client: **SCS Engineers** Laboratory ID: **TB08087-001**

Description: **HJGC** Matrix: **Solid**

Date Sampled: **02/08/2018 1049** % Solids: **65.6** **02/14/2018 2116**

Date Received: **02/08/2018**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(SGT - HEM (n) 9071B	1	02/19/2018 0000	NFB		64817

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
SGT - HEM (non-polar material)		**9071B**	**1100**		**290**	**150**	**mg/kg**	**1**

LOQ = Limit of Quantitation
U = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Volatiles

Client: **SCS Engineers** Laboratory ID: **TB08087-001**

Description: **HJGC** Matrix: **Solid**

Date Sampled: **02/08/2018 1049** % Solids: **65.6** **02/14/2018 2116**

Date Received: **02/08/2018**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch	Leachate Date
1	1311/5030B	8260B	10	02/13/2018 1406	JJG		64344	02/11/2018 1930

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Benzene	71-43-2	8260B	0.0040	U	0.050	0.0040	mg/L	1
2-Butanone (MEK)	78-93-3	8260B	0.020	U	0.10	0.020	mg/L	1
Carbon tetrachloride	56-23-5	8260B	0.0040	U	0.050	0.0040	mg/L	1
Chlorobenzene	108-90-7	8260B	0.0040	U	0.050	0.0040	mg/L	1
Chloroform	67-66-3	8260B	0.0040	U	0.050	0.0040	mg/L	1
1,2-Dichloroethane	107-06-2	8260B	0.0040	U	0.050	0.0040	mg/L	1
1,1-Dichloroethene	75-35-4	8260B	0.0040	U	0.050	0.0040	mg/L	1
Tetrachloroethene	127-18-4	8260B	0.0040	U	0.050	0.0040	mg/L	1
Trichloroethene	79-01-6	8260B	0.0040	U	0.050	0.0040	mg/L	1
Vinyl chloride	75-01-4	8260B	0.0040	U	0.010	0.0040	mg/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		100	70-130
Bromofluorobenzene		101	70-130
Toluene-d8		106	70-130

LOQ = Limit of Quantitation
U = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Semivolatiles

Client: **SCS Engineers** Laboratory ID: **TB08087-001**

Description: **HJGC** Matrix: **Solid**

Date Sampled: **02/08/2018 1049** % Solids: **65.6** **02/14/2018 2116**

Date Received: **02/08/2018**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch	Leachate Date
1	1311/3520C	8270D	1	02/15/2018 1344	CMP2	02/12/2018 1738	64269	02/11/2018 1930

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
1,4-Dichlorobenzene	106-46-7	8270D	0.0050	U	0.040	0.0050	mg/L	1
2,4-Dinitrotoluene	121-14-2	8270D	0.0050	U	0.080	0.0050	mg/L	1
Hexachlorobenzene	118-74-1	8270D	0.0050	U	0.040	0.0050	mg/L	1
Hexachlorobutadiene	87-68-3	8270D	0.0050	U	0.040	0.0050	mg/L	1
Hexachloroethane	67-72-1	8270D	0.010	U	0.040	0.010	mg/L	1
2-Methylphenol	95-48-7	8270D	0.010	U	0.040	0.010	mg/L	1
3+4-Methylphenol	106-44-5	8270D	0.015	U	0.040	0.015	mg/L	1
Nitrobenzene	98-95-3	8270D	0.015	U	0.040	0.015	mg/L	1
Pentachlorophenol	87-86-5	8270D	0.020	U	0.20	0.020	mg/L	1
Pyridine	110-86-1	8270D	0.0050	U	0.040	0.0050	mg/L	1
2,4,5-Trichlorophenol	95-95-4	8270D	0.0050	U	0.040	0.0050	mg/L	1
2,4,6-Trichlorophenol	88-06-2	8270D	0.0050	U	0.040	0.0050	mg/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
2-Fluorobiphenyl		82	37-129
2-Fluorophenol		67	24-127
Nitrobenzene-d5		106	38-127
Phenol-d5		77	28-128
Terphenyl-d14		102	10-148
2,4,6-Tribromophenol		102	41-144

LOQ = Limit of Quantitation
U = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

PCBs by GC

Client: **SCS Engineers** Laboratory ID: **TB08087-001**

Description: **HJGC** Matrix: **Solid**

Date Sampled: **02/08/2018 1049** % Solids: **65.6** **02/14/2018 2116**

Date Received: **02/08/2018**

Run	Prep Method	Cleanup	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3550C	3660B/3665A	8082A	10	02/15/2018 1033	CHG	02/14/2018 1648	64516

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Aroclor 1016	12674-11-2	8082A	0.06	U	0.26	0.06	mg/Kg	1
Aroclor 1221	11104-28-2	8082A	0.06	U	0.26	0.06	mg/Kg	1
Aroclor 1232	11141-16-5	8082A	0.06	U	0.26	0.06	mg/Kg	1
Aroclor 1242	**53469-21-9**	**8082A**	**1.3**		**0.26**	**0.06**	**mg/Kg**	**1**
Aroclor 1248	12672-29-6	8082A	0.06	U	0.26	0.06	mg/Kg	1
Aroclor 1254	**11097-69-1**	**8082A**	**0.34**		**0.26**	**0.06**	**mg/Kg**	**1**
Aroclor 1260	11096-82-5	8082A	0.06	U	0.26	0.06	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
Decachlorobiphenyl		102	41-132
Tetrachloro-m-xylene		78	35-106

LOQ = Limit of Quantitation
U = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Herbicides

Client: **SCS Engineers** Laboratory ID: **TB08087-001**

Description: **HJGC** Matrix: **Solid**

Date Sampled: **02/08/2018 1049** % Solids: **65.6** **02/14/2018 2116**

Date Received: **02/08/2018**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch	Leachate Date
1	1311/8151A	8151A	1	02/15/2018 1447	DAL1	02/13/2018 1941	64366	02/11/2018 1930

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
2,4-D	94-75-7	8151A	0.0050	U	0.020	0.0050	mg/L	1
2,4,5-TP (Silvex)	93-72-1	8151A	0.0013	U	0.0050	0.0013	mg/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
DCAA		83	62-117

LOQ = Limit of Quantitation
U = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Pesticides

Client: **SCS Engineers** Laboratory ID: **TB08087-001**

Description: **HJGC** Matrix: **Solid**

Date Sampled: **02/08/2018 1049** % Solids: **65.6** **02/14/2018 2116**

Date Received: **02/08/2018**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch	Leachate Date
1	1311/3520C	8081B	1	02/13/2018 1730	PMS	02/12/2018 1738	64285	02/11/2018 1930

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
gamma-BHC (Lindane)	58-89-9	8081B	0.00017	U	0.00040	0.00017	mg/L	1
Chlordane	57-74-9	8081B	0.0015	U	0.0040	0.0015	mg/L	1
Endrin	72-20-8	8081B	0.00015	U	0.00040	0.00015	mg/L	1
Heptachlor	76-44-8	8081B	0.00015	U	0.00040	0.00015	mg/L	1
Heptachlor epoxide	1024-57-3	8081B	0.00016	U	0.00040	0.00016	mg/L	1
Methoxychlor	72-43-5	8081B	0.00021	U	0.0016	0.00021	mg/L	1
Toxaphene	8001-35-2	8081B	0.0030	U	0.0080	0.0030	mg/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
Decachlorobiphenyl		89	20-131
Tetrachloro-m-xylene		76	26-132

LOQ = Limit of Quantitation
U = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Metals

Client: **SCS Engineers** Laboratory ID: **TB08087-001**

Description: **HJGC** Matrix: **Solid**

Date Sampled: **02/08/2018 1049** % Solids: **65.6** **02/14/2018 2116**

Date Received: **02/08/2018**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch	Leachate Date
1	1311/3010A	6010D	1	02/15/2018 1310	CJZ	02/13/2018 1737	64381	02/11/2018 1930
1	1311/7470A	7470A	1	02/13/2018 2034	SLS	02/13/2018 1512	64353	02/11/2018 1930

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
Arsenic	**7440-38-2**	**6010D**	**0.027**	**J**	**0.15**	**0.025**	**mg/L**	**1**
Barium	**7440-39-3**	**6010D**	**0.94**		**0.25**	**0.031**	**mg/L**	**1**
Cadmium	7440-43-9	6010D	0.0060	U	0.050	0.0060	mg/L	1
Chromium	**7440-47-3**	**6010D**	**0.036**	**J**	**0.10**	**0.013**	**mg/L**	**1**
Lead	**7439-92-1**	**6010D**	**0.15**		**0.10**	**0.047**	**mg/L**	**1**
Mercury	7439-97-6	7470A	0.00091	U	0.0020	0.00091	mg/L	1
Selenium	7782-49-2	6010D	0.085	U	0.20	0.085	mg/L	1
Silver	7440-22-4	6010D	0.021	U	0.10	0.021	mg/L	1

LOQ = Limit of Quantitation
U = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

QC Summary

Inorganic non-metals - MB

Sample ID: TQ64817-001
Batch: 64817
Analytical Method: 9071B
Matrix: Solid

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
SGT - HEM (non-polar material)	100	U	1	200	100	mg/kg	02/19/2018 0000

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit

N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Inorganic non-metals - LCS

Sample ID: TQ64817-002 **Matrix:** Solid

Batch: 64817

Analytical Method: 9071B

Parameter	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
SGT - HEM (non-polar material)	1000	820		1	82	70-130	02/19/2018 0000

LOQ = Limit of Quantitation

DL = Detection Limit

LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%

J = Estimated result < LOQ and ≥ DL

U = Not detected at or above the detection limit

N = Recovery is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Inorganic non-metals - Duplicate

Sample ID: TB08087-001DU
Matrix: Solid
Batch: 64817
Analytical Method: 9071B

Parameter	Sample Amount (mg/kg)	Result (mg/kg)	Q	Dil	% RPD	% RPD Limit	Analysis Date
SGT - HEM (non-polar material)	1100	1100	+	1	39	20	02/19/2018 0000

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Inorganic non-metals - MS

Sample ID: TB08087-001MS
Batch: 64817
Analytical Method: 9071B
Matrix: Solid

Parameter	Sample Amount (mg/kg)	Spike Amount (mg/kg)	Result (mg/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
SGT - HEM (non-polar material)	1100	1500	3000	N	1	153	70-130	02/19/2018 0000

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Volatiles - MB

Sample ID: TQ64344-001
Batch: 64344
Analytical Method: 8260B
Matrix: Solid
Prep Method: 1311/5030B
Leachate Date: 02/11/2018 1930

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Benzene	0.0040	U	10	0.050	0.0040	mg/L	02/13/2018 1256
2-Butanone (MEK)	0.020	U	10	0.10	0.020	mg/L	02/13/2018 1256
Carbon tetrachloride	0.0040	U	10	0.050	0.0040	mg/L	02/13/2018 1256
Chlorobenzene	0.0040	U	10	0.050	0.0040	mg/L	02/13/2018 1256
Chloroform	0.0040	U	10	0.050	0.0040	mg/L	02/13/2018 1256
1,2-Dichloroethane	0.0040	U	10	0.050	0.0040	mg/L	02/13/2018 1256
1,1-Dichloroethene	0.0040	U	10	0.050	0.0040	mg/L	02/13/2018 1256
Tetrachloroethene	0.0040	U	10	0.050	0.0040	mg/L	02/13/2018 1256
Trichloroethene	0.0040	U	10	0.050	0.0040	mg/L	02/13/2018 1256
Vinyl chloride	0.0040	U	10	0.010	0.0040	mg/L	02/13/2018 1256

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		111	70-130
Bromofluorobenzene		108	70-130
Toluene-d8		111	70-130

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Volatiles - LCS

Sample ID: TQ64344-002
Batch: 64344
Analytical Method: 8260B
Matrix: Solid
Prep Method: 1311/5030B
Leachate Date: 02/11/2018 1930

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Benzene	0.50	0.54		10	108	70-130	02/13/2018 1233
2-Butanone (MEK)	1.0	1.0		10	105	70-130	02/13/2018 1233
Carbon tetrachloride	0.50	0.58		10	117	70-130	02/13/2018 1233
Chlorobenzene	0.50	0.53		10	106	70-130	02/13/2018 1233
Chloroform	0.50	0.57		10	113	70-130	02/13/2018 1233
1,2-Dichloroethane	0.50	0.57		10	114	70-130	02/13/2018 1233
1,1-Dichloroethene	0.50	0.56		10	112	70-130	02/13/2018 1233
Tetrachloroethene	0.50	0.53		10	107	70-130	02/13/2018 1233
Trichloroethene	0.50	0.54		10	109	70-130	02/13/2018 1233
Vinyl chloride	0.50	0.56		10	113	70-130	02/13/2018 1233

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		96	70-130
Bromofluorobenzene		99	70-130
Toluene-d8		101	70-130

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Volatiles - MS

Sample ID: TB08087-001MS
Batch: 64344
Analytical Method: 8260B
Matrix: Solid
Prep Method: 1311/5030B
Leachate Date: 02/11/2018 1930

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Benzene	0.0	0.50	0.59		10	117	70-130	02/13/2018 1429
2-Butanone (MEK)	0.0	1.0	1.0		10	103	70-130	02/13/2018 1429
Carbon tetrachloride	0.0	0.50	0.64		10	127	70-130	02/13/2018 1429
Chlorobenzene	0.0	0.50	0.56		10	113	70-130	02/13/2018 1429
Chloroform	0.0	0.50	0.60		10	121	70-130	02/13/2018 1429
1,2-Dichloroethane	0.0	0.50	0.58		10	117	70-130	02/13/2018 1429
1,1-Dichloroethene	0.0	0.50	0.61		10	123	70-130	02/13/2018 1429
Tetrachloroethene	0.0	0.50	0.58		10	115	70-130	02/13/2018 1429
Trichloroethene	0.0	0.50	0.59		10	118	70-130	02/13/2018 1429
Vinyl chloride	0.0	0.50	0.63		10	126	70-130	02/13/2018 1429

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		99	70-130
Bromofluorobenzene		103	70-130
Toluene-d8		106	70-130

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Semivolatiles - MB

Sample ID: TQ64269-001
Batch: 64269
Analytical Method: 8270D
Matrix: Solid
Prep Method: 1311/3520C
Prep Date: 02/12/2018 1738 **Leachate Date:** 02/11/2018 1930

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
1,4-Dichlorobenzene	0.0050	U	1	0.040	0.0050	mg/L	02/15/2018 1029
2,4-Dinitrotoluene	0.0050	U	1	0.080	0.0050	mg/L	02/15/2018 1029
Hexachlorobenzene	0.0050	U	1	0.040	0.0050	mg/L	02/15/2018 1029
Hexachlorobutadiene	0.0050	U	1	0.040	0.0050	mg/L	02/15/2018 1029
Hexachloroethane	0.010	U	1	0.040	0.010	mg/L	02/15/2018 1029
2-Methylphenol	0.010	U	1	0.040	0.010	mg/L	02/15/2018 1029
3+4-Methylphenol	0.015	U	1	0.040	0.015	mg/L	02/15/2018 1029
Nitrobenzene	0.015	U	1	0.040	0.015	mg/L	02/15/2018 1029
Pentachlorophenol	0.020	U	1	0.20	0.020	mg/L	02/15/2018 1029
Pyridine	0.0050	U	1	0.040	0.0050	mg/L	02/15/2018 1029
2,4,5-Trichlorophenol	0.0050	U	1	0.040	0.0050	mg/L	02/15/2018 1029
2,4,6-Trichlorophenol	0.0050	U	1	0.040	0.0050	mg/L	02/15/2018 1029

Surrogate	Q	% Rec	Acceptance Limit
2-Fluorobiphenyl		83	37-129
2-Fluorophenol		54	24-127
Nitrobenzene-d5		93	38-127
Phenol-d5		64	28-128
Terphenyl-d14		100	10-148
2,4,6-Tribromophenol		102	41-144

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Semivolatiles - LCS

Sample ID: TQ64269-002
Batch: 64269
Analytical Method: 8270D
Matrix: Solid
Prep Method: 1311/3520C
Prep Date: 02/12/2018 1738 **Leachate Date:** 02/11/2018 1930

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
1,4-Dichlorobenzene	0.40	0.27		1	68	30-130	02/15/2018 1053
2,4-Dinitrotoluene	0.40	0.36		1	90	30-130	02/15/2018 1053
Hexachlorobenzene	0.40	0.42		1	105	30-130	02/15/2018 1053
Hexachlorobutadiene	0.40	0.21		1	53	30-130	02/15/2018 1053
Hexachloroethane	0.40	0.22		1	56	30-130	02/15/2018 1053
2-Methylphenol	0.40	0.36		1	90	30-130	02/15/2018 1053
3+4-Methylphenol	0.80	0.85		1	106	30-130	02/15/2018 1053
Nitrobenzene	0.40	0.44		1	111	30-130	02/15/2018 1053
Pentachlorophenol	0.40	0.36		1	90	30-130	02/15/2018 1053
Pyridine	0.40	0.39		1	97	30-130	02/15/2018 1053
2,4,5-Trichlorophenol	0.40	0.38		1	95	30-130	02/15/2018 1053
2,4,6-Trichlorophenol	0.40	0.34		1	86	30-130	02/15/2018 1053

Surrogate	Q	% Rec	Acceptance Limit
2-Fluorobiphenyl		85	37-129
2-Fluorophenol		68	24-127
Nitrobenzene-d5		108	38-127
Phenol-d5		83	28-128
Terphenyl-d14		99	10-148
2,4,6-Tribromophenol		100	41-144

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Pesticides - MB

Sample ID: TQ64285-001
Batch: 64285
Analytical Method: 8081B

Matrix: Solid
Prep Method: 1311/3520C
Prep Date: 02/12/2018 1738 **Leachate Date:** 02/11/2018 1930

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
gamma-BHC (Lindane)	0.00017	U	1	0.00040	0.00017	mg/L	02/13/2018 1644
Chlordane	0.0015	U	1	0.0040	0.0015	mg/L	02/13/2018 1644
Endrin	0.00015	U	1	0.00040	0.00015	mg/L	02/13/2018 1644
Heptachlor	0.00015	U	1	0.00040	0.00015	mg/L	02/13/2018 1644
Heptachlor epoxide	0.00016	U	1	0.00040	0.00016	mg/L	02/13/2018 1644
Methoxychlor	0.00021	U	1	0.0016	0.00021	mg/L	02/13/2018 1644
Toxaphene	0.0030	U	1	0.0080	0.0030	mg/L	02/13/2018 1644

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		93	20-131
Tetrachloro-m-xylene		82	26-132

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit

N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Pesticides - LCS

Sample ID: TQ64285-002
Batch: 64285
Analytical Method: 8081B

Matrix: Solid
Prep Method: 1311/3520C
Prep Date: 02/12/2018 1738 **Leachate Date:** 02/11/2018 1930

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
gamma-BHC (Lindane)	0.0080	0.0078		1	98	70-130	02/13/2018 1659
Chlordane	0.0080	0.0098	P	1	123	70-130	02/13/2018 1659
Endrin	0.0080	0.0074		1	93	70-130	02/13/2018 1659
Heptachlor	0.0080	0.0075		1	94	70-130	02/13/2018 1659
Heptachlor epoxide	0.0080	0.0072		1	90	70-130	02/13/2018 1659
Methoxychlor	0.0080	0.0079		1	99	70-130	02/13/2018 1659
Toxaphene	0.016	0.015		1	94	70-130	02/13/2018 1659

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		101	20-131
Tetrachloro-m-xylene		84	26-132

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit

N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Pesticides - MS

Sample ID: TB08087-001MS
Batch: 64285
Analytical Method: 8081B
Matrix: Solid
Prep Method: 1311/3520C
Prep Date: 02/12/2018 1738 **Leachate Date:** 02/11/2018 1930

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
gamma-BHC (Lindane)	0.0	0.0080	0.0078		1	98	70-130	02/13/2018 1746
Chlordane	0.0	0.0080	0.0057	P	1	71	70-130	02/13/2018 1746
Endrin	0.0	0.0080	0.0072		1	90	70-130	02/13/2018 1746
Heptachlor	0.0	0.0080	0.0072		1	90	70-130	02/13/2018 1746
Heptachlor epoxide	0.0	0.0080	0.0068		1	85	70-130	02/13/2018 1746
Methoxychlor	0.0	0.0080	0.0080		1	100	70-130	02/13/2018 1746
Toxaphene	0.0	0.016	0.013		1	83	70-130	02/13/2018 1746

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		96	20-131
Tetrachloro-m-xylene		76	26-132

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Herbicides - MB

Sample ID: TQ64366-001
Batch: 64366
Analytical Method: 8151A
Matrix: Solid
Prep Method: 1311/8151A
Prep Date: 02/13/2018 1941 **Leachate Date:** 02/11/2018 1930

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
2,4-D	0.0050	U	1	0.020	0.0050	mg/L	02/14/2018 1526
2,4,5-TP (Silvex)	0.0013	U	1	0.0050	0.0013	mg/L	02/14/2018 1526

Surrogate	Q	% Rec	Acceptance Limit
DCAA		80	62-117

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Herbicides - LCS

Sample ID: TQ64366-002
Batch: 64366
Analytical Method: 8151A

Matrix: Solid
Prep Method: 1311/8151A
Prep Date: 02/13/2018 1941 **Leachate Date:** 02/11/2018 1930

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
2,4-D	0.20	0.14		1	72	59-139	02/14/2018 1549
2,4,5-TP (Silvex)	0.20	0.17		1	84	56-132	02/14/2018 1549

Surrogate	Q	% Rec	Acceptance Limit
DCAA		89	62-117

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit

N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Herbicides - MS

Sample ID: TB08087-001MS
Batch: 64366
Analytical Method: 8151A

Matrix: Solid
Prep Method: 1311/8151A
Prep Date: 02/13/2018 1941 **Leachate Date:** 02/11/2018 1930

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
2,4-D	0.0	0.20	0.13		1	63	59-139	02/15/2018 1510
2,4,5-TP (Silvex)	0.0	0.20	0.15		1	74	56-132	02/15/2018 1510

Surrogate	Q	% Rec	Acceptance Limit
DCAA		86	62-117

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit

N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

PCBs by GC - MB

Sample ID: TQ64516-001
Batch: 64516
Analytical Method: 8082A
Matrix: Solid
Prep Method: 3550C
Prep Date: 02/14/2018 1648
Cleanup: 3660B/3665A

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Aroclor 1016	0.004	U	1	0.017	0.004	mg/Kg	02/15/2018 0953
Aroclor 1221	0.004	U	1	0.017	0.004	mg/Kg	02/15/2018 0953
Aroclor 1232	0.004	U	1	0.017	0.004	mg/Kg	02/15/2018 0953
Aroclor 1242	0.004	U	1	0.017	0.004	mg/Kg	02/15/2018 0953
Aroclor 1248	0.004	U	1	0.017	0.004	mg/Kg	02/15/2018 0953
Aroclor 1254	0.004	U	1	0.017	0.004	mg/Kg	02/15/2018 0953
Aroclor 1260	0.004	U	1	0.017	0.004	mg/Kg	02/15/2018 0953

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		54	41-132
Tetrachloro-m-xylene		51	35-106

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

PCBs by GC - LCS

Sample ID: TQ64516-002
Batch: 64516
Analytical Method: 8082A
Matrix: Solid
Prep Method: 3550C
Prep Date: 02/14/2018 1648
Cleanup: 3660B/3665A

Parameter	Spike Amount (mg/Kg)	Result (mg/Kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Aroclor 1016	0.083	0.071		1	86	70-130	02/15/2018 1006
Aroclor 1260	0.083	0.067		1	81	70-130	02/15/2018 1006

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		93	41-132
Tetrachloro-m-xylene		80	35-106

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

PCBs by GC - MS

Sample ID: TB08087-001MS
Batch: 64516
Analytical Method: 8082A
Matrix: Solid
Prep Method: 3550C
Prep Date: 02/14/2018 1648
Cleanup: 3660B/3665A

Parameter	Sample Amount (mg/Kg)	Spike Amount (mg/Kg)	Result (mg/Kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Aroclor 1016	0	0.12	0.31	N	10	252	70-130	02/15/2018 1046
Aroclor 1260	0	0.12	0.12		10	98	70-130	02/15/2018 1046

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		55	41-132
Tetrachloro-m-xylene		41	35-106

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

PCBs by GC - MSD

Sample ID: TB08087-001MD
Batch: 64516
Analytical Method: 8082A
Matrix: Solid
Prep Method: 3550C
Prep Date: 02/14/2018 1648
Cleanup: 3660B/3665A

Parameter	Sample Amount (mg/Kg)	Spike Amount (mg/Kg)	Result (mg/Kg)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Aroclor 1016	0	0.13	0.43	N,+	10	340	31	70-130	20	02/15/2018 1059
Aroclor 1260	0	0.13	0.13	P	10	105	7.9	70-130	20	02/15/2018 1059

Surrogate	Q	% Rec	Acceptance Limit
Decachlorobiphenyl		94	41-132
Tetrachloro-m-xylene		79	35-106

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Metals - MB

Sample ID: TQ64381-001
Batch: 64381
Analytical Method: 6010D
Matrix: Solid
Prep Method: 1311/3010A
Prep Date: 02/13/2018 1737 **Leachate Date:** 02/11/2018 1930

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Arsenic	0.0025	U	1	0.015	0.0025	mg/L	02/15/2018 1231
Barium	**0.0044**	**J**	**1**	**0.025**	**0.0031**	**mg/L**	**02/15/2018 1231**
Cadmium	**0.0060**		**1**	**0.0050**	**0.00060**	**mg/L**	**02/15/2018 1231**
Chromium	0.0013	U	1	0.010	0.0013	mg/L	02/15/2018 1231
Lead	**0.013**		**1**	**0.010**	**0.0047**	**mg/L**	**02/15/2018 1231**
Selenium	0.0085	U	1	0.020	0.0085	mg/L	02/15/2018 1231
Silver	0.0021	U	1	0.010	0.0021	mg/L	02/15/2018 1231

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Metals - LCS

Sample ID: TQ64381-002
Batch: 64381
Analytical Method: 6010D
Matrix: Solid
Prep Method: 1311/3010A
Prep Date: 02/13/2018 1737 **Leachate Date:** 02/11/2018 1930

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Arsenic	50	47		1	93	80-120	02/15/2018 1236
Barium	100	94		1	94	80-120	02/15/2018 1236
Cadmium	10	9.3		1	93	80-120	02/15/2018 1236
Chromium	50	50		1	101	80-120	02/15/2018 1236
Lead	50	48		1	97	80-120	02/15/2018 1236
Selenium	10	9.4		1	94	80-120	02/15/2018 1236
Silver	10	10		1	100	80-120	02/15/2018 1236

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Metals - MB

Sample ID: TQ64353-001
Batch: 64353
Analytical Method: 7470A
Matrix: Solid
Prep Method: 1311/7470A
Prep Date: 02/13/2018 1512 **Leachate Date:** 02/11/2018 1930

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
Mercury	0.000091	U	1	0.00020	0.000091	mg/L	02/13/2018 2020

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

TCLP Metals - LCS

Sample ID: TQ64353-002
Batch: 64353
Analytical Method: 7470A
Matrix: Solid
Prep Method: 1311/7470A
Prep Date: 02/13/2018 1512 **Leachate Date:** 02/11/2018 1930

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.020	0.021		1	107	80-120	02/13/2018 2023

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
U = Not detected at or above the detection limit
N = Recovery is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Chain of Custody
and
Miscellaneous Documents

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

SHEALY ENVIRONMENTAL SERVICES, INC.

Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.shealylab.com

Number 79662

Client: SCS Engineers	Report to Contact: ~~Jarred Timmons~~ STEVE LAMB	Telephone No. / E-mail: jtimmons@scsengineers.com	Quote No.: 20795
Address: 2520 Whitehall Park Dr #450	Sampler's Signature: X	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Charlotte	State: NC Zip Code: 28273	Printed Name: JARRED TIMMONS	TB08087
Project Name: RATCLIFFE GOLF, REN. PARK GC DESIGN			
Project No.: 02217302.00	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	# of Containers	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	TCLP VOC	TCLP SVOC	TCLP Metals	TCLP Pest	TCLP Herb	Total Pcbs	TPH-HEM SGT 9070B			Remarks / Cooler I.D.
HJGC	02/08/2018	10:49am	C				7						X	X	X	X	X	X	X			

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: JARRED TIMMONS	02/08/18	1245	1. Received by: TF	2/8/18	1245
2. Relinquished by:	2/8/18	1540	2. Received by:	2.8.18	1540
3. Relinquished by:	2.8.18	1700	3. Received by	Date	Time
4. Relinquished by	Date	Time	4. Laboratory received by:	Date 2.8.18	Time 1700

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack Receipt Temp. 3.1 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Shealy Environmental Services, Inc.
Document Number: ME0018C-11

Page 1 of 1
Effective Date: 01/19/2018

Sample Receipt Checklist (SRC)

Client: SCS Cooler Inspected by/date: CBW / 2-8-18 Lot #: T180087

Means of receipt: ☑ SESI ☐ Client ☐ UPS ☐ FedEx ☐ Other: _____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: _____ Chlorine Strip ID: _____

Cooler ID / Original temperature upon receipt / Derived (Corrected) temperature upon receipt:

__/__/__°C __/__/__°C 3.1/3.1/__°C __/__/__°C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 6 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☐ Yes	☐ No	☑ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number used taken from the container label?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4, HNO_3, HCl, NaOH) using SR # _____.

Sample(s) _____ were received with bubbles >6 mm in diameter.

Samples(s) _____ were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: _____.

SR barcode labels applied by: CBW Date: 2-8-18

Comments:

REPUBLIC SERVICES **SPECIAL WASTE PROFILE**

Requested Disposal Facility: 5010 Charlotte Motor Speedway LF NC

Waste Profile #
Sales Rep #:

Saveable fill-in form. Restricted printing until all required (yellow) fields are completed.

I. Generator Information

Generator Name: City of Charlotte			
Generator Site Address: 1536 Tyvola Road			
City: Charlotte	County: Mecklenburg	State: North Carolina	Zip: 28217
State ID/Reg No:	State Approval/Waste Code: (if applicable)		NAICS # :
Generator Mailing Address (if different): ☑ 600 East Fourth Street			
City: Charlotte	County: Mecklenburg	State: North Carolina	Zip: 28202
Generator Contact Name: Doug Pierotti		Email: dpierotti@charlottenc.gov	
Phone Number: (704) 432-5212	Ext:	Fax Number: (704) 336-4554	

II. Billing Information

Bill To: SCS Engineers		Contact Name: Steve Lamb	
Billing Address: 2520 Whitehall Park Drive		Email: slamb@scsengineers.com	
City: Charlotte	State: NC	Zip: 28273	Phone: (704) 504-3170

III. Waste Stream Information

Name of Waste: Former York Rd (Renaissance) Landfill Municipal Solid Waste (MSW) drilling waste	
Process Generating Waste: Waste generated from former MSW from closed York Road landfill exploratory drilling	
Type of Waste:	☑ INDUSTRIAL PROCESS WASTE ☐ POLLUTION CONTROL WASTE
Physical State:	☑ SOLID ☐ SEMI-SOLID ☐ POWDER ☐ LIQUID
Method of Shipment:	☐ BULK ☑ DRUM ☐ BAGGED ☐ OTHER:
Estimated Annual Volume:	5 Drums
Frequency:	☑ ONE TIME ☐ ONGOING
Disposal Consideration:	☑ LANDFILL ☐ SOLIDIFICATION ☐ BIOREMEDIATION

IV. Representative Sample Certification ☐ NO SAMPLE TAKEN

Is the representative sample collected to prepare this profile and laboratory analysis, collected in accordance with U.S. EPA 40 CFR 261.20(c) guidelines or equivalent rules?	☑ YES or ☐ NO
Type of Sample: ☑ COMPOSITE SAMPLE ☐ GRAB SAMPLE	
Sample Date: 02/08/2018	
Sample ID Numbers: 001 - HJGC	

Waste Profile #

V. Physical Characteristics of Waste

Characteristic Components	% by Weight (range)
1. MSW	50
2. Soil	50
3.	
4.	
5.	

Color	Odor (describe)	Does Waste Contain Free Liquids?	% Solids	pH:	Flash Point
Various-black	MSW	☐ YES or ☑ NO	100	NA	NA °F

Attach Laboratory Analytical Report (and/or Material Safety Data Sheet) Including Chain of Custody and Required Parameters Provided for this Profile

Does this waste or generating process contain regulated concentrations of the following Pesticides and/or Herbicides: Chlordane, Endrin, Heptachlor (and its epoxides), Lindane, Methoxychlor, Toxaphene, 2,4-D, or 2,4,5-TP Silvex as defined in 40 CFR 261.33?	☐ Yes or ☑ No
Does this waste contain reactive sulfides (greater than 500 ppm) or reactive cyanide (greater than 250 ppm)[reference 40 CFR 261.23(a)(5)]?	☐ Yes or ☑ No
Does this waste contain regulated concentrations of Polychlorinated Biphenyls (PCBs) as defined in 40 CFR Part 761?	☐ Yes or ☑ No
Does this waste contain concentrations of listed hazardous wastes defined in 40 CFR 261.31, 261.32, 261.33, including RCRA F-Listed Solvents?	☐ Yes or ☑ No
Does this waste exhibit a Hazardous Characteristic as defined by Federal and/or State regulations?	☐ Yes or ☑ No
Does this waste contain regulated concentrations of 2,3,7,8-Tetrachlorodibenzodioxin (2,3,7,8-TCCD), or any other dioxin as defined in 40 CFR 261.31?	☐ Yes or ☑ No
Is this a regulated Radioactive Waste as defined by Federal and/or State regulations?	☐ Yes or ☑ No
Is this a regulated Medical or Infectious Waste as defined by Federal and/or State regulations?	☐ Yes or ☑ No
Is this waste a reactive or heat generating waste?	☐ Yes or ☑ No
Does the waste contain sulfur or sulfur by-products?	☐ Yes or ☑ No
Is this waste generated at a Federal Superfund Clean Up Site?	☐ Yes or ☑ No
Is this waste from a TSD facility, TSD like facility or consolidator?	☐ Yes or ☑ No

VI. Certification

I hereby certify that to the best of my knowledge and belief, the information contained herein is a true, complete and accurate description of the waste material being offered for disposal and all known or suspected hazards have been disclosed. All Analytical Results/Material Safety Data Sheets submitted are truthful and complete and are representative of the waste.

I further certify that by utilizing this profile, neither myself nor any other employee of the company will deliver for disposal or attempt to deliver for disposal any waste which is classified as toxic waste, hazardous waste or infectious waste, or any other waste material this facility is prohibited from accepting by law. I shall immediately give written notice of any change or condition pertaining to the waste not provided herein. Our company hereby agrees to fully indemnify this disposal facility against any damages resulting from this certification being inaccurate or untrue.

I further certify that the company has not altered the form or content of this profile sheet as provided by Republic Services Inc.

Doug Pierotti, Senior Project Manager	City of Charlotte
Authorized Representative Name And Title (Type or Print)	Company Name
Doug Pierotti for City of Charlotte	3-1-2018
Authorized Representative Signature	Date

Appendix B

LEGEND

Existing Green

Existing Centerline — 1

Existing Waste Bunker

Existing Bunker

Existing Tee

Proposed Centerline — 1

Proposed Chipping Area

Proposed Bunker

Proposed Mounds

Proposed Tee

Proposed Green

HARRY L. JONES GOLF COURSE

CHARLOTTE, NORTH CAROLINA

MASTER PLAN

SHEET 1

RON GARL GOLF COURSE DESIGN
704 S. MISSOURI AVENUE
LAKELAND, FLORIDA, 33815
PHONE: 863-688-8383
WEB SITE: www.rongarl.com

DRAWN: R. NIX	CHECKED: Ron Garl
DATE: November 14, 2017 Revised - July 6, 2018	SCALE: N.T.S.

HOLE	YARDS	PAR	HOLE	YARDS	PAR
1	389	4	10	420	4
2	123	3	11	155	3
3	538	5	12	369	4
4	163	3	13	106	3
5	517	5	14	545	5
6	321	4	15	422	4
7	395	4	16	505	5
8	319	4	17	400	4
9	405	4	18	393	4
OUT	3170	36	IN	3315	36
			OUT	3170	36
			TOTAL	6485	72

PAR 3 COURSE

HOLE	YARDS	PAR
1	60	3
2	100	3
3	70	3
4	80	3
5	90	3
6	110	3
IN	510	18

...\base 4-30-2018.dgn Jul. 06, 2018 11:46:55

LEGEND

Existing Green

Existing Centerline

Existing Waste Bunker

Existing Bunker

Existing Tee

Proposed Centerline

Proposed Chipping Area

Proposed Bunker

Proposed Mounds

Proposed Tee

Proposed Green

HARRY L. JONES GOLF COURSE

CHARLOTTE, NORTH CAROLINA

MASTER PLAN

SHEET 1

RON GARL GOLF COURSE DESIGN
704 S. MISSOURI AVENUE
LAKELAND, FLORIDA, 33815
PHONE: 863-688-8383
WEB SITE: www.rongarl.com

DRAWN: R. NIX	CHECKED: Ron Garl
DATE: November 14, 2017 Revised - July 6, 2018	SCALE: N.T.S.

HOLE	YARDS	PAR	HOLE	YARDS	PAR
1	389	4	10	420	4
2	123	3	11	155	3
3	538	5	12	369	4
4	163	3	13	106	3
5	517	5	14	545	5
6	321	4	15	422	4
7	395	4	16	505	5
8	319	4	17	400	4
9	405	4	18	393	4
OUT	3170	36	IN	3315	36
			OUT	3170	36
			TOTAL	6485	72

PAR 3 COURSE

HOLE	YARDS	PAR
1	60	3
2	100	3
3	70	3
4	80	3
5	90	3
6	110	3
IN	510	18

...\master plan2.dgn Jul. 06, 2018 14:08:39

Appendix C

HARRY L. JONES GOLF COURSE
18 HOLE GOLF COURSE RENOVATION
PRELIMINARY COST ESTIMATE

Prepared by

RONALD M. GARL GOLF COURSE DESIGN, INC.
704 SOUTH MISSOURI AVENUE
LAKELAND, FLORIDA
PHONE: (863) 688-8383

July 6, 2018

CONSTRUCTION ITEM	**COST**
1. Selective Clearing (Allowance)	100,000
2. Strip Existing Turf from Tees, including Driving Range Tee Haul & Dispose of (160,000 sq.ft. x $.20 sq.ft.) Sod removed - Hauled and disposed of In House	-0-
3. Strip Existing Turf from Greens Surfaces, Haul & Dispose of (130,000 sq.ft. x $.20 sq.ft.) Sod removed - Hauled and disposed of In House	-0-
4. Remove Old Greens Mix to a depth of 12 inches & Haul to Tees – In House	-0-
4a. Spread old greens mix & float (4,775 c.y. x $5 c.y.)	23,875
5. Strip Top Soil and stockpile – Holes #10 & #14 - 1 ft. deep = 1,600 c.y. x 4/ac x $2	12,800
6. Hole #10 & #14 – cut 2/ac on each hole 2.5' deep = 16,000 c.y. x $3 c.y.	48,000
7. Move existing fill from greens and features on the golf course Holes #1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13 & 17 2,000 c.y. per hole x 13 holes = 26,000 c.y. x $3 c.y.)	78,000
8. Reshape and deepen lake at Green #12 (28,000 s.f. = 6,216 c.y. x $5.00 c.y.)	31,080
9. **Rock Excavation – to be determined by Owners' Rep – Del Ratcliffe	-0-
10. Earthwork – Move Soil from Stockpile to the Golf Course – 72,000 c.y. @ $3	216,000
11. Rotadarion Existing Tees, Fairways and Rough – (94/ac x $1,100/ac)	103,400
12. Rough Shaping – 18 holes, Short Game Area & Driving Range	200,000
13. New Automatic Irrigation System – (1,000 heads x $1,100 per head)	1,100,000
14. Pump Station for Irrigation Distribution (Recently Upgraded)	-0-

15. Remove & Dispose of existing greens drainage pipe and gravel – (18 x $1,000/hole)	18,000
16. Rototill Green Sub-Grade - 18 holes, Putting Green & Short Game x $200/hole	4,000
17. New USGA Greens Construction with Granite – 150,000 sq.ft. x $6 sq.ft.	900,000
18. Four-inch Green Outfall Pipe – 150 l.ft. x 25 greens = 3,750 l.ft. @ $6/l.ft.	22,500
19. Four-inch Fairway Perforated Pipe with Granite Rock – 4,500 l.ft. x $7.50 l.f.	33,750
20. Catch Basin – 50 units x $300 ea.	15,000
21. Outfall Pipe – 50 units x 100 ft. x $8 ft./av.	40,000
22. Fine Shaping	360,000
23. Plating Topsoil – Holes #10 & #14 - 1 ft. deep = 1,600 c.y. x 4.0 acres x $2	12,800
24. Laser Level Tee Tops including Range Tee – (176,000 sq.ft. @ $.15 sq.ft.)	26,400
25. New Bunker Construction (includes sand & drainage – 200,000 sq.ft. x $2 sq.ft.)	400,000
26. Installation of new outfall pipe – 81 bunkers x 150 l. ft. = 12,150 x $6	72,900
27. Dispose of rock and pipe from existing bunkers - - 18 holes x $500 ea.	9,000
28. Cart Paths – Allowance – Owner's and Engineer's Responsibility	475,000
29. Grassing - Sprig Tees (Celebration - 176,000 sq.ft. @ $.16 sq.ft. - Hand Plant	28,160
30. Grassing - Sprig Fairways including Range (Celebration – 54/ac @ 600 bushels/ac x $1,500/ ac)	81,000
31. Grassing - Sprig Roughs (Celebration – 40/ac @ 600 bushels/ ac x $1,500/ac)	60,000
32. Grassing - Sod (Celebration – 750,000 sq.ft. x $.55 sq.ft.)	412,500
33. Grassing - Sprig Putting Surfaces & Collars (Mini-Verde – 180,000 sq.ft. x $.52 sq.ft.)	93,600
34. As-builts	7,500
35. Mobilization, Site prep, Housing, Overhead and Management	155,000
SUB-TOTAL	5,140,265
Contingency – 15%	771,039
TOTAL	**5,911,304**

* Cubic yards, sq.ft. & acreage are an estimate only and shall be revised upon a completed Golf Course Grading Plan.

** Rock Excavation not included.

NOTES:

a) This estimate does not charge any environmental work to the golf course.
b) This preliminary estimate will vary for each site depending on specific site conditions.
c) This estimate represents the golf course designer's best judgement as a design professional familiar with the golf course construction industry. It is recognized, however, that the golf course designer has no control over the contractor's method of determining bid prices or over competitive bidding or negotiating conditions. While the golf course designer cannot and does not warrant or represent that bids or negotiated prices will not vary from the Preliminary Cost Estimate, the Preliminary Cost Estimate represents the golf course designer's best, good faith estimate of construction costs based upon his knowledge of current market conditions and construction techniques.
d) The owner shall include a contingency amount (as a percentage of the total) which would be applicable to the project, the projects' location, its features and difficulty of the site.
e) SCS Engineers to determine Best Methods and Means to correct as best as possible the settling on the golf course. This includes any and all drainage, cart paths, Geo Technical fabric to be used on the golf course and etc., etc., etc. and cost for these items. (We have put in an estimate only to move the project along.)

OWNER'S RESPONSIBILITIES:

1. New 6" Topography Map
2. Survey for Centerlines & to Establish Benchmarks
   (to be done prior to start of construction)
3. Survey to Verify Fill on the Golf Course
4. Survey to Verify Cut on the Back 9 Holes
5. Maintenance Equipment - additional
6. Landscaping
7. Golf Course Construction Contingency
8. Golf Course Architect fee
9. Professional Fees:
   - Civil Engineer
   - Environmental Engineer
   - Geotechnical Engineer
   - Landscape Architect
   - and Others
10. Project Manager- Owner's Representative
11. Fees – Permits and Recording
12. Easement Locations
13. Signage, Markers, Trash Containers, Benches, Etc.
14. Advertising & Promotional Expenses
15. Grow-In
16. Grand Opening
17. Etc.

Harry L. Jones, Jr. Golf
Preliminary Construction Cost Estimate
Landfill Related Items

	Description	Quantity	Unit	Unit Cost	Extended Cost	Comments
1	**Tees and Greens**					
1.1	Synthetic Liner for Tee and Greens	60,000	SF	$1.50	$90,000	assumes 8 greens at 7,500 sf each
1.2	Perforated Pipe for Tee and Greens	2,000	LF	$8	$16,000	
1.3	Extra Sand Layer Under Liners	500	CY	$30	$15,000	assume 6" layer underneath all liners
				Subtotal	**$121,000**	
2	**Soil Surcharging for Fairways, Tees and Greens.**					
2.1	Move and Place Soil	129,000	CY	$3.50	$451,500	
2.2	Compact Soil	129,000	CY	$0.50	$64,500	
2.3	Survey and Monitoring	1	LS	$40,000	$40,000	
2.4	Remove Soil	64,500	CY	$1.50	$96,750	assumes 1/2 of surcharge soil remains in place.
				Subtotal	**$637,750**	
3	**Rapid Impact Compaction for Cart Paths**					
3.1	Mobilization	1	ls	$50,000	$50,000	
3.2	Compaction	90,000	sf	$3	$270,000	assumes 3,000 yds of new cart paths.
3.3	Compacted fill, 3 ft x 8 ft	8,000	cy	$4	$32,000	assume 3 ft of settlement
				Subtotal	**$352,000**	
4	**Geogrid Reinforcement**	100,000	sf	1.25	$125,000	For select cart paths, tees, and fairways.
				Subtotal	**$125,000**	
				Subtotal	**$1,235,750**	
				Miscellaneous at 10%	$123,575	
				Contingency at 10%	$123,575	
				Total	**$1,483,000**	