EXHIBIT A

SCOPE OF SERVICES

HERNANDO COUNTY NORTHWEST WASTE MANAGEMENT FACILITY
CLASS I, CELL 4 LANDFILL EXPANSION PHASE 3 – CONSTRUCTION SERVICES

This Scope of Services describes Phase 3 construction phase services to be provided by HDR Engineering, Inc. (HDR) for the Class I, Cell 4 landfill expansion project at the Northwest Waste Management Facility (NWWMF) in Hernando County, FL (Project). Primary elements of the Project include construction of a new 30-acre, double geosynthetic lined waste disposal cell with geotextile reinforcement layer, construction of stormwater control structures, a leachate transmission force-main, and an above-ground leachate pump station connecting the three Cell 4 leachate sump systems to a new leachate tank farm with two 150,000-gallon above-ground storage tanks and a truck loading pump station. Other Project elements include perimeter access road improvements, stormwater conveyance system, maintenance equipment access road, instrumentation and controls associated with the leachate collection and transmission system, expansion of the electrical power distribution system to Cell 4, and other ancillary improvements.

Phase 1 work on the Project involved preparation of a Site Master Plan Update Report, Cell 4 area subsurface investigations, and the conceptual design of Cell 4. Phase 2 work involved detailed design and permitting of Cell 4 through the Florida Department of Environmental Protection (FDEP), Environmental Resource Permitting (ERP), construction-level design and bid documents, and bid support services. In Phase 3, HDR will provide construction phase engineering services including office engineering, construction management, construction quality assurance (CQA) services during construction, material testing, and a Cell Construction Certification Report for FDEP approval for acceptance of Class I Solid Waste.

Brown and Caldwell will support HDR by providing construction engineering services for the electrical and mechanical portion of the Project. Coastal Engineering will be responsible for providing surveying services in support of the Project to confirm compliance with permit requirements. GeoView Associates will support HDR by performing a subsurface geophysical investigation prior to construction. Oasis Construction Services will support HDR by performing on-site construction observation and material testing services as part of the Construction Quality Assurance (CQA) program.

For budgeting purposes, it has been assumed that daily construction observation will be provided by the HDR team throughout the duration of the Project. During construction of Project elements that do not require CQA documentation to FDEP, construction observation may not need to be full time. HDR will provide field staff to monitor work on these Project elements as appropriate for the level of Contractor activity involved. During liner and leachate collection system construction and other Project elements requiring

CQA documentation to FDEP, HDR team will provide full-time construction management and CQA staff as required by FDEP and consistent with the FDEP-approved CQA Plan for Cell 4 construction. The number of staff on-site at any one time will be commensurate with the size and number of installation crews deployed by the Contractor to meet the schedule requirements of the Project.

In preparing this Scope of Services and the Project Budget in Exhibit B, the following general assumptions were made:

1. The Project is assumed to include two contracts as follows: (1) a confirmatory pressure grouting contract intended to fill subsurface voids in the Cell 4 footprint and (2) a Cell 4 construction contract covering all other Project elements including for soils and geosynthetics. It is assumed that work associated with the pressure grouting contract will be completed prior to issuance of a Notice to Proceed on the Cell 4 construction contract.

2. The pressure grouting contract is assumed to have a duration of no more than 30 field days. Work is assumed to begin in March 2024 and to be completed prior to the end of April 2024.

3. The Cell 4 construction contract is assumed to begin in May 2024 and to be substantially complete 15 months later in August 2025. Final construction completion is assumed to occur in September 2025 and Project close-out is assumed to be complete by October 2025, a total of 17 months after the County's initial Notice to Proceed to the Contractor.

4. During the Cell 4 construction contract, geotextile reinforcement, soil subbase, double liner system, leachate collection and detection systems, protective cover and other cell related construction activities requiring on-site CQA personnel are assumed to have an aggregate duration of 48 weeks. HDR's CQA team and personnel will be on-site for this period.

5. For the Cell 4 construction contract, a work day was assumed to be a 10-hour period. For budgeting purposes, it was assumed that the Contractor will work 60 hours per week, Monday through Saturday.

6. The Contractor will be responsible for construction surveying as called for in the specifications, including the preparation of record drawing documentation. The HDR team will provide surveying services only when needed to confirm the Contractor's data or when requested by Hernando County.

7. Hernando County will be responsible for all permit and service connection fees that have not otherwise been defined as the responsibility of the Contractor in the specifications.

The work for this Project has been divided into 6 primary work elements, or tasks. A description of the work to be performed in each task is presented in the following paragraphs.

Task 1 - Project Management

Project Management includes contract administration activities and project coordination meetings with County staff during the construction phase of the Project.

Subtask 1.1 - Contract Administration Prepare and execute subcontract agreements with all members of the HDR Team. Prepare the Project Management Plan and the Field Health and Safety Plan for the Project. Process subconsultant pay requests and submit a combined invoice for all members of the HDR Team to Hernando County each month. Monitor the progress of work on a weekly basis to assure compliance with the established Project Schedule and Project Budget.

Subtask 1.2 - Project Kickoff Meeting Prepare for and attend the project kickoff meeting with County staff to review the key elements and critical path schedule for the Project, to introduce key individuals from the HDR Team who will be leading the construction management effort, and to open lines of communication between County staff and the HDR Team.

Subtask 1.3 - Project Coordination The HDR Team will conduct bi-weekly project team coordination meetings to review project status, discuss technical construction details, site inspection and prepare and schedule for upcoming project tasks and subtasks. HDR will prepare for and attend bi-weekly project update meetings with County staff and Contractor to review and update the key elements and critical path schedule for the Project, review project safety protocols, address Contractor performance, issues and concerns, discuss CQA observation, and present upcoming construction activities and organization.

Task 2 – Subsurface Investigation/Remediation Confirmation Services for FDEP Concurrence

FDEP requests that a confirmatory subsurface investigation and potential further remediation be performed prior to construction of Cell 4 in the area of GV-14.

In this task, HDR will first prepare a scope of work for GeoView to perform a follow up geophysical investigation in the area around GV-14 and in select areas within the excavated footprint of Cell 4. HDR will contract with GeoView, after approval from the County, to perform the agreed-upon scope of work and will coordinate with GeoView during the investigation and reporting effort. HDR and the County will review the report(s) and provide comments to GeoView prior to issuance of the final report(s).

Utilizing the GeoView information, HDR will then prepare design documents for use by Hernando County's selected grouting contractor, EarthTech, for the Cell 4 confirmation

pressure grouting in locations identified in the GeoView report. HDR will provide full-time field observation services and reporting. The confirmation report will compile the field information recorded during the grouting and provide confirmation to the County and FDEP of remediation of subsurface anomalies identified in the GeoView report.

Hernando County will be responsible for administration of the pressure grouting contract with EarthTech. HDR will be responsible for day-to-day field observation and field coordination with EarthTech during pressure grouting operations. Upon completion, HDR will prepare and submit a signed and sealed grouting completion report to FDEP.

Subtask 2.1 – Confirmatory Subsurface Investigation Engineering Support
Prepare a scope of services and detailed figures for GeoView to conduct a confirmatory geophysical subsurface survey of select areas within the Cell 4 footprint to identify anomalies associated with potential sinkholes. HDR will meet with GeoView on site for a pre-geophysical survey meeting prior to field activities. HDR will coordinate with GeoView and the County to identify the areas to be surveyed. HDR and the County will review the GeoView report(s) and develop a strategy to address the anomalies and survey the exact locations of the anomalies in the field.

Utilizing updated subsurface information collected and reported by GeoView, HDR will develop a scope of services for Hernando County's contracted driller/grout injection contractor, EarthTech, to further investigate and then to remediate the anomalies reported in the GeoView report(s). HDR will provide plans and technical support documentation for use by Earth Tech to provide Hernando County a proposal price and schedule to complete the work as set forth in HDR's scope of services. HDR will provide responses to requests for additional information and prepare supplemental technical information, if required.

Subtask 2.2 - Pre-Construction Conference Attend the pre-construction conference with the Earth Tech and County staff. Coordinate with County in responding to scope-related inquiries, as applicable, and as directed by County staff.

Subtask 2.3 - Construction Observation Full-time onsite field observation during grouting activities and weekly construction meetings to discuss the work in progress. Assumed that pressure grouting will take 30 business days to complete, 10-hour days of field time for field observation and a total of four (4) weekly site visits by the Project Manager have been budgeted.

Subtask 2.4 - Pressure Grouting Documentation Develop the report documenting the work performed by Earth Tech. Prepare a letter to FDEP on behalf of Hernando County transmitting the report and certifying the pressure grouting work is complete as a condition of the construction permit for the Cell 4 Landfill.

Task 3 - Project Control for Cell 4 Construction

In this task, HDR will assist the County with the review of the Cell 4 Construction Contractor's construction schedule, progress payments, and change order requests as described in the following Subtasks:

Subtask 3.1 - Review Contractor's Construction Schedule HDR will review the Cell 4 Construction Contractor's preliminary construction schedule for conformance with Project requirements and make recommendations to the County for revisions, if necessary. Each month, HDR will review the Contractor's updated schedule to assure that construction activities and overall progress of the Project are being reflected correctly and that any change order work has been integrated into the construction schedule. The review will also include discussions with the Contractor regarding how the Contractor will regain and maintain the completion schedule if work is behind schedule.

Subtask 3.2 - Review Contractor's Requests for Periodic Progress Payments HDR will review all progress payment applications submitted by the Cell 4 Construction Contractor and advise the County whether the amount requested reflects the progress of the Contractor's work. If necessary, HDR will recommend appropriate adjustments to Contractor payment applications. Once all necessary adjustments have been made by the Contractor, HDR will forward the approved progress payment applications to the Authority.

Subtask 3.3 — Review Contractor Change Order Requests HDR will review all change order requests submitted by the Cell 4 Construction Contractor. Reviews will include a determination of whether the Contractor's request is legitimate based upon the requirements and provisions of the contract documents, an analysis of the Contractor's cost estimate and an evaluation of impacts to the Project completion schedule. Preparation of independent cost estimates for change order work by the Contractor is not part of HDR's work under this task.

HDR will forward draft change order documents, including written recommendations, for review by the County. The draft change order package will include a full description of the change, the estimated cost, the impact to the project schedule and a justification/basis for recommending approval or denial. The County will have sole responsibility for approving and executing change orders. Budgeting for this subtask is based on receiving and reviewing ten (10) change order requests from the Cell 4 Construction Contractor.

Task 4 — Cell 4 Construction Management

Cell 4 construction management activities include attendance at a pre-construction conference, review of Contractor submittals, office engineering, and attendance at monthly construction progress meetings with County staff and the Cell 4 Construction Contractor. Resident project representative services for Project elements not requiring CQA documentation will also be provided under this task.

Subtask 4.1 - Pre-Construction Conference. As soon as possible after contract award and prior to the beginning of any construction activities, HDR will organize, schedule and conduct two (one prior to construction commencement and one prior to geosynthetic installation) pre-construction conferences to be attended by County staff, the Cell 4 Construction Contractor and major subcontractors. HDR will prepare an agenda and distribute minutes from the pre-construction conference to all attendees of the meeting.

Subtask 4.2 - Review Contractor Submittals HDR will review the Cell 4 Construction Contractor's submittals for materials and equipment proposed for use on the Project against the requirements of the plans and specifications. HDR will perform the reviews and return the submittals in a timely fashion, as defined in the contract documents, so as not to delay the Contractor in completing the work. Any deficiencies will be noted on the submittal with instructions for correction and re-submittal. HDR will maintain a log of shop drawings, submittals, and related construction documents, and their disposition.

Subtask 4.3 - Office Engineering HDR will provide office engineering support during the course of construction to answer any questions the Cell 4 Construction Contractor may have, to provide interpretation of design intent or to provide input to minor design modifications that result from unforeseen circumstances or conditions in the field.

Subtask 4.4 - Bi-Weekly Construction Progress Meetings Each two weeks, HDR will prepare for and lead a construction progress meeting to review the work completed the previous two weeks, to preview the work to be performed during the next two weeks, to discuss the Contractor's updated schedule for construction completion, and to address questions or issues requiring input by the County. The Contractor's red-line drawings, to be used for record drawing preparation, will also be reviewed at this meeting to assure that the Contractor is keeping up with documentation of field changes as they occur. It is anticipated that the bi-weekly construction progress meetings will be attended by County staff, HDR Team staff and representatives of the Contractor's Cell 4 construction team. HDR will prepare agenda and minutes of each bi-weekly meeting and distribute them to all attendees. For budgeting purposes, a total of 34 meetings at the Project site have been assumed.

Subtask 4.5 - Resident Project Representation HDR will provide resident project representative (RPR) services during Cell 4 construction to observe and document work on Project elements not requiring CQA documentation for FDEP. Examples of these Project elements include earthwork, stormwater management system, utility lines, access roads, leachate transmission main, above ground leachate storage tanks, and electrical and instrumentation and control (EIC) improvements.

The responsibilities of the RPR will be to monitor the activities of the Cell 4 Contractor to assure that the project is constructed in a quality manner, according to the design intent and the FDEP permit conditions, and that the Contractor performs in accordance with the terms and conditions of the contract. In so doing, the RPR will be responsible for observing the Contractor's work for quality of workmanship and conformance with the plans and specifications, reviewing material and performance test data submitted by the Contractor and tracking field changes for documentation on record drawings. The RPR

shall also prepare comprehensive daily field reports and coordinate with the HDR Project Manager in preparing monthly status reports to the County on the progress of work.

The RPR shall not have responsibility for the Cell 4 Contractor's means and methods for performing the work. However, if questionable methods are observed, the RPR will have the authority to raise his concerns to the Cell 4 Contractor, the HDR Project Manager and the County and to document them in the Project file. The RPR shall also advise the HDR Project Manager and the County of any deviations, defects or deficiencies observed in the work.

For the purposes of budgeting, it is assumed that the equivalent of one full-time RPR will be on-site for a period of 4 months of the 17-month project. During some periods of heavy Contractor activity, more than one individual will need to be on-site. During other periods, only part-time RPR services may be required.

Subtask 4.7 – Surveying Coastal, as a member of the HDR Team, will perform miscellaneous surveying during construction, as needed to confirm the Contractor's survey data or as may be requested by Hernando County. For budgeting purposes, a total of 25 survey crew days and associated office time have been assumed for this subtask.

Task 5 - Cell 4 Construction Quality Assurance

Cell 4 Construction Quality Assurance (CQA) includes full-time observation, conformance testing and certification of all Project elements included in the FDEP-approved CQA Plan. The Project elements requiring CQA documentation and certification include the following:

- Prepared liner system sub-grade
- Liner reinforcement system, including 12-inch subbase on Cell 4 side slopes
- GCL
- Secondary HDPE geomembrane liner and geocomposite leak detection layer
- Primary HDPE geomembrane liner and geocomposite drainage layer
- Leachate collection piping within the footprint of Cell 4 and between Cell 4 and the Leachate Lift Station and Leachate Tank Farm
- 24-inch protective soil cover over primary liner
- Subcell sumps, monitoring station and pumping system

This task also includes preparation of a CQA Certification Report to FDEP following liner construction. This report must be approved by FDEP before waste can be disposed of in Cell 4.

Subtask 5.1 - CQA Field Services The HDR Team will provide full-time CQA inspection and documentation of Contractor activities during construction of the Cell 4 Subgrade and Subbase, Cell 4 bottom liner, the Cell 4 leachate collection system and the leachate transmission piping between Cell 4 and the associated Leachate Lift Station and Leachate Tank Farm. The CQA field personnel will maintain a daily construction log and will document all work performed by the Contractor as required in by Chapter 62-701.400 (7) F.A.C. and the FDEP-approved CQA Plan. Construction photographs will be taken on a weekly (and sometimes daily) basis to assist in documenting the work performed. As-built survey information provided by the Cell 4 Contractor will be incorporated into the preparation of record drawings for the Project as described in Subtask 6.3.

Subtask 5.2 - CQA Conformance Testing HDR will provide for testing of the prepared liner sub-grade and sub-base surfaces and for conformance testing of the soil and geosynthetic materials used in the Cell 4 bottom liner system as defined in the FDEP-approved CQA Plan.

Subtask 5.3 - CQA Certification Report HDR will prepare the CQA Certification Report for submittal to FDEP documenting that the Cell 4 bottom liner and leachate collection systems were constructed in substantial conformance with the plans and specifications and that the requirements of the FDEP-approved CQA Plan were satisfied. The CQA Certification report along with record drawings of the bottom liner and leachate collection system improvements, signed and sealed as-builts and FDEP Form 62-701.900 (2), F.A.C. will be prepared and submitted electronically.

Subtask 5.4 - Responses to RAIs from FDEP on CQA Certification Report HDR will respond to requests for additional information (RAIs) from FDEP on the draft CQA Certification Report. For budgeting purposes, it is assumed that responses to no more than two (2) RAIs will be required and that no more than 80 hours of professional labor will be required to prepare the responses.

Task 6 - Cell 4 Project Closeout

Project closeout activities include certification of Substantial Completion, certification of Final Completion and Engineer of Record certification to the County and to FDEP that the project has been completed in substantial conformance with the plans and specifications.

Task 6.1 - Substantial Completion HDR will review the Cell 4 Contractor's application and documentation regarding Substantial Completion and issue a written recommendation to Hernando County regarding whether or not the Project is substantially complete in accordance with the contract documents, is in compliance with permit conditions, and can be put to beneficial use by the County (Certificate of Occupancy issued). As part of this review, HDR will make a thorough inspection of the Cell 4 Contractor's work, including all disciplines, and prepare a detailed punch list of incomplete work or work that does not conform to the requirements of the contract documents or permits. The Cell 4 Contractor will be required to address these work items

to the satisfaction of HDR and the County before a certification of Final Completion will be issued.

Task 6.2 - Final Completion HDR will review the Contractor's application and documentation regarding Final Completion. As part of this review, HDR will schedule and organize a final inspection of the Project with the Cell 4 Contractor and representatives of the County. Following the review, HDR will produce a final inspection report based upon the documentation provided by the Cell 4 Contractor addressing the punch list items and HDR's observations made during the final inspection.

Subtask 6.3 - Record Drawings Based upon the documentation of field changes maintained by the Cell 4 Contractor and the notes and records maintained by the RPR staff, HDR will prepare a set of Project record drawings for submittal to the County. The record drawings will incorporate information on the bottom liner and leachate collection system compiled by the CQA inspection team.

Subtask 6.4 - Project Close-Out HDR will provide Engineer-of-Record certification of construction completion to Hernando County, organize any Project files maintained on-site for permanent recordkeeping by the County, and assist County staff in preparing any additional documentation of Project completion that may be required by local County agencies.

EXHIBIT B

PROJECT BUDGET

HERNANDO COUNTY NORTHWEST WASTE MANAGEMENT FACILITY

CLASS I, CELL 4 LANDFILL EXPANSION PHASE 3 - CONSTRUCTION SERVICES

HDR proposes to perform the Scope of Services described in Exhibit A, for an estimated fee of **$1,437,429**, which includes current estimates for labor, direct expenses and subconsultant fees. This fee estimate is based upon the assumptions stated in Exhibit A and is subject to change pending the General Contractor's schedule for completion of the Project and deployment of manpower and equipment. HDR will notify Hernando County immediately of any potential change in the Project Budget resulting from the Contractor's schedule or means and methods for completing the work.

Invoicing will be monthly on a lump sum percent complete basis according to the labor rates identified on the attached Fee Schedule. Direct expenses will be invoiced at cost in accordance with the terms of our contract with Hernando County. A breakdown of the current budget estimate is also provided on the following pages. Please note that this breakdown of estimated labor cost, direct expenses and subconsultant fees provides a basis for level of effort only. The mix of labor categories required, labor hours within those categories, direct expenses and subconsultant fees are subject to change based upon Project requirements.

Hernando County Class I Cell 4 Landfill Expansion - Phase 3
Northwest Waste Management Facility
Feb-24

Task Description	Staff Effort Forecast (Hrs.)										Expenses ($)			
	Senior PM	Sr. Tech Adv.	Tech Adv.	Proj. Eng.	Senior Civil Engineer	Sr. CADD Tech.	Senior Admin	Sr. Accounting	Total Hours	Labor ($)	Travel, Per Diem & Office Exp. ($)	Sub Costs ($)	Total Exp. ($)	Total Fee ($)
	$210.00	$225.00	$210.00	$145.00	$150.00	$105.00	$65.00	$85.00						
TASK 1 - PROJECT MANAGEMENT														
Sub-Task 1.1 - Contract Administration	128	2	0	8	0	0	66	30	234	$35,330	$827	$16,732	$17,569	$52,899
Project Setup	8	0	0	0	0	0	8	2	18	$2,770				
Prepare Project Management Plan	12	0	0	0	0	0	8	0	20	$3,040				
Prepare Field Health & Safety Plan	6	2	0	8	0	0	8	0	24	$3,390				
Monitor the Progress of Work (60 weeks)	60	0	0	0	0	0	0	0	60	$12,600				
Review and Process Sub-Consultants' Invoices and Document Services Completed	14	0	0	0	0	0	14	14	42	$5,040				
Prepare Monthly Summaries of Work Completed to Accompany HDR Invoices to Hernando County (14 months)	28	0	0	0	0	0	28	14	70	$8,890				
Sub-Task 1.2 - Project Kick-Off Meeting	8	8	0	12	8	0	12	0	48	$7,200	$360		$360	$7,560
Agenda, Meeting, and Minutes	8	8	0	12	8	0	12	0	48	$7,200	$360			
Sub-Task 1.3 - Project Coordination	34	34	17	34	17	17	34	0	187	$29,835	$0		$0	$29,835
Project Team Coordination Meetings	34	34	17	34	17	17	34	0	187	$29,835				
Monthly Project Update Meetings with Hernando County (Addressed in 4.4)	0	0	0	0	0	0	0	0	0	$0				
TASK 1 - TOTAL	170	44	17	54	25	17	112	30	469	$72,365	$1,197	$16,732	$17,929	$90,294
2-SUBSURFACE INVESTIGATION/REMEDIATION CONFIRMATION FOR FDEP CONCURRENCE														
Sub-Task 2.1 - Confirmatory Subsurface Investigation Engineering Support	30	52	16	28	0	52	12	4	194	$32,000	$1,033	$6,250	$7,283	$39,283
Coordinate with GeoView and Review GeoView Report and Make Recommendation	12	16	4	0	0	20	4	2	58	$9,490	$573	$4,250		
Additional Surveying Support	2	4	8	4	0	8	6	2	26	$3,300	$360	$2,000		
Prepare Scope of Work, Design Plans and Technical Support Documentation	8	24	12	24	0	24	2	0	94	$15,710				
On-Site Stakhole Review	8	8	0	0	0	0	0	0	16	$3,480	$360			
Sub-Task 2.2 - Pre-Construction Conference	8	8	0	10	0	0	0	0	26	$4,930	$360	$0	$360	$5,290
Agenda, Meeting and Minutes for pre-construction with EarthTec	8	8	0	10	0	0	0	0	26	$4,930	$360			
Sub-Task 2.3 - Construction Observation	48	48	0	300	0	0	0	0	396	$64,380	$11,760	$0	$11,760	$76,140
Full-Time Onsite Field Observation (20 work days) and Weekly Construction Meetings (6 weekly meetings)	48	48	0	300	0	0	0	0	396	$64,380	$11,760			
Sub-Task 2.4 - Pressure Grouting Documentation	12	24	10	32	0	12	4	0	94	$16,180	$0	$0	$0	$16,180
Develop Report, Pressure Grouting Quantities and Pressure Grouting Certification	8	16	8	24	0	12	4	0	72	$11,960				
Prepare Letter to FDEP	4	8	2	8	0	0	0	0	22	$4,220			$0	
TASK 2 - TOTAL	98	132	26	370	0	64	16	4	710	$117,490	$13,153	$6,250	$19,403	$136,893
TASK 3 - PROJECT CONTROL FOR CELL 4 CONSTRUCTION														
Sub-Task 3.1 - Review Contractor's Construction Schedule	32	34	2	38	0	0	28	0	134	$22,120	$0	$0	$0	$22,120
Review Contractor's Schedule for Conformance with Project Requirements	2	2	2	6	0	0	0	0	12	$2,160				
Recommend Revisions	2	4	0	4	0	0	0	0	10	$1,900				
Monthly Schedule Updates Review and Overall Contractor Progress	28	28	0	28	0	0	28	0	112	$18,060				
Sub-Task 3.2 - Review Contractor's Requests for Periodic Progress Payments	28	0	0	0	0	0	14	0	40	$6,790	$0	$0	$0	$6,790
Review Payments and Recommend Appropriate Adjustments	28	0	0	0	0	0	14	0	40	$6,790				
Sub-Task 3.3 - Review Contractor Change Order Requests	20	20	2	40	20	0	20	0	122	$19,220	$630	$12,600	$13,230	$32,450
Review Change Orders (10)	20	20	2	40	20	0	20	0	122	$19,220	$630	$12,600		
TASK 3 - TOTAL	80	54	4	78	20	0	62	0	296	$48,130	$630	$12,600	$13,230	$61,360
TASK 4 - CELL 4 CONSTRUCTION MANAGEMENT														
Sub-Task 4.1 - Pre-Construction Conferences	16	16	8	20	8	0	20	0	88	$14,040	$720	$0	$720	$14,760
Agenda, Meeting and Minutes for 2 pre-construction meetings	16	16	8	20	8	0	20	0	88	$14,040	$720			
Sub-Task 4.2 - Review Contractor Submittals	36	216	48	0	0	0	120	0	420	$74,040	$1,022	$20,448	$21,470	$95,510
Submittals (180)	24	192	24	0	0	0	96	0	336	$59,520	$1,022	$20,448		
Re-Submittals (50)	12	24	24	0	0	0	24	0	84	$14,520				
Sub-Task 4.3 - Office Engineering	72	88	32	88	0	68	24	0	372	$63,180	$0	$0	$0	$63,180
Address Questions	48	48	16	48	0	20	24	0	204	$34,860				
Minor Design Adjustments and Clarifications	24	40	16	40	0	48	0	0	168	$28,320				
Sub-Task 4.4 - Bi-Weekly Construction Progress Meetings	272	136	136	32	136	0	34	0	746	$141,530	$13,912	$33,448	$47,360	$190,890
Agenda, Meeting and Minutes (24)	272	136	136	32	136	0	34	0	746	$141,530	$13,912	$33,448		
Sub-Task 4.5 - Resident Project Representation	40	40	0	800	40	0	40	8	968	$142,680	$25,600	$0	$25,600	$168,280
Part-time Resident Services (4 months/50 hours per week)	40	40	0	800	40	0	40	8	968	$142,680	$25,600			
Sub-Task 4.6 - Surveying	4	4	4	4	0	0	4	2	22	$3,590	$300	$6,000	$6,300	$9,890
Coordination with Surveyor	4	4	4	4	0	0	4	2	22	$3,590	$300	$6,000		
TASK 4 - TOTAL	440	500	228	944	184	68	242	10	2616	$440,980	$41,554	$59,896	$101,450	$542,430
TASK 5 - CELL 4 CONSTRUCTION QUALITY ASSURANCE														
Sub-Task 5.1 - CQA Field Services	48	48	0	48	48	0	24	12	228	$37,620	$14,321	$286,410	$300,731	$338,351
Coordination with CQA	48	48	0	48	48	0	24	12	228	$37,620	$14,321	$286,410		
Sub-Task 5.2 - CQA Conformance Testing	12	24	0	24	24	0	24	12	120	$17,580	$5,868	$117,350	$123,218	$140,798
Coordination with CQA	12	24	0	24	24	0	24	12	120	$17,580	$5,868	$117,350		
Sub-Task 5.3 - CQA Certification Report	14	26	12	86	12	12	20	0	182	$28,140	$0	$0	$0	$28,140
Report	12	24	12	80	12	12	20	0	172	$26,400				
FDEP Form 62-701.900(2)	2	2	0	6	0	0	0	0	10	$1,740				
Sub-Task 5.4 - RAIs	6	12	0	32	0	6	0	6	62	$9,740	$0	$0	$0	$9,740
RAI #1; HDR Review	4	8	0	24	0	4	0	4	44	$6,800				
RAI #2; HDR Review	2	4	0	8	0	2	0	2	18	$2,860				
TASK 5 - TOTAL	80	110	12	190	84	18	68	30	592	$93,080	$20,189	$403,760	$423,949	$517,029
TASK 6 - CELL 4 PROJECT CLOSEOUT														
Sub-Task 6.1 - Substantial Completion	24	24	24	40	0	16	0	16	144	$24,320	$720	$0	$720	$25,040
Inspections	8	8	8	16	0	16	0	8	64	$9,840	$360			
Punch List	4	4	4	12	0	0	0	4	28	$4,440				
Review and Inspect Contractor Improvement	12	12	12	12	0	0	0	4	52	$9,820	$360			
Sub-Task 6.2 - Final Completion	20	24	18	28	2	8	0	10	110	$19,430	$720	$0	$720	$20,150
Inspections	8	8	8	8	0	8	0	4	44	$7,500	$360			
Punch List	4	8	2	8	2	0	0	4	28	$4,860				
Review and Inspect Contractor Improvement	8	8	8	12	0	0	0	2	38	$7,070	$360			
Sub-Task 6.3 - Record Drawings	8	8	8	8	8	16	0	8	64	$9,880	$499	$9,984	$10,483	$20,363
Record Drawings	8	8	8	8	8	16	0	8	64	$9,880	$499	$9,984		
Sub-Task 6.4 - Project Close-Out	22	28	6	56	4	8	4	22	150	$23,870	$0	$0	$0	$23,870
Certification of Construction	8	2	2	8	0	0	0	4	24	$4,050				
Update Financial Assurance Cost Estimate for Closure and Post Closure Care	8	18	0	36	0	8	0	6	76	$12,300				
Project Completion Documentation	6	8	4	12	4	0	4	12	50	$7,520				
TASK 6 - TOTAL	74	84	56	132	14	48	4	56	468	$77,500	$1,939	$9,984	$11,923	$89,423
TOTAL	942	924	343	1768	327	215	504	130	5151	$849,545	$78,662	$509,222	$587,884	$1,437,429

LABOR TOTAL	$	849,545
HDR DIRECT COSTS		$78,662
SUBCONSULTANTS		
GeoView	$	4,250
Brown and Caldwell	$	93,212
Coastal	$	8,000
Oasis Field Services	$	403,760
JHA	$	-
TOTAL FEE	**$**	**1,437,429**

EXHIBIT C

PROJECT SCHEDULE

HERNANDO COUNTY NORTHWEST WASTE MANAGEMENT FACILITY

CLASS I, CELL 4 LANDFILL EXPANSION PHASE 3 - CONSTRUCTION SERVICES

Work Activity	**Milestone Date**
Notice to Proceed	March 1st 2024
Pressure Grouting Complete	April 1st, 2024
Contract Award and Notice to Proceed	May 1st, 2024
Cell 4 Liner Construction Complete	May 1st, 2025
Construction Substantially Complete	August 1st, 2025
Final Completion of Cell 4 Construction	September 1st, 2025
FDEP Inspection and Approval of Construction	September 1st, 2025
Project Close-Out	October 1st, 2025

2301 Lucien Way, Suite 250
Maitland, Florida 32751
T: 407.661.9500
www.brownandcaldwell.com

January 5, 2024

Mr. Mark Roberts, P.E.
HDR Engineering, Inc.
200 West Forsythe Street, Suite 800
Jacksonville, FL 32202

Subject: Hernando County Class I Landfill Cell 4 Engineering Services During Construction

Dear Mr. Roberts:

In response to your request, Brown and Caldwell (BC) has prepared this proposal to provide engineering services during construction in relation to the Class I Cell 4 landfill project at the Northwest Waste Management Facility in Hernando County, Florida. BC's proposed services include engineering services during construction of the leachate pumping system and the leachate pumping electrical system.

Scope of Services

Task 1 - Project Administration

Project Administration will be provided by BC to track project cost and expenditures, deliverable schedules, coordination with HDR and the County, and coordination of BC's project resources.

Task 2 - Review Contractor Shop Drawing Submittals

BC will review Contractor submittals for conformity with the contract documents. BC's review will not include the review of means and methods of construction and other approvals related to such tasks.

BC has assumed the following submittals will be reviewed with respect to the leachate pumping system:

1. Primary and secondary leachate side-riser pumps
2. Lift station duplex pumps
3. Tanker truck transfer pumps

BC has assumed 40 staff hours for submittal reviews for the leachate pumping system and one round of resubmittal.

BC has assumed the following submittals will be reviewed with respect to the leachate pumping electrical system:

1. Electrical submittal – panelboard, automatic transfer switch conduit, generator receptacle, cable and lighting
2. Instruments submittal
3. Control panel submittal

4. Pump Motors listed above for leachate pumping system

BC has assumed 40 staff hours for submittal reviews for the leachate pumping electrical system and one round of resubmittal.

BC has not included review of pump wet-wells or concrete pads associated with the leachate pumping system of the leachate pumping electrical system.

Task 3 - Visits During Construction

BC will perform the following visits during construction for the purposes of viewing the work:

1. Six (6) visits during the construction of the leachate pumping system and do not include the leachate storage tank system, pump wet-well or equipment slabs
2. Six (6) visits during the construction of the leachate pumping electrical system

After each site visit, BC's representative will prepare a field report documenting observations made. BC has assumed 80 staff hours for visits during construction.

Task 4 - Respond to RFIs and Review Requests for Change Orders

BC will review and prepare responses for up to five (5) RFIs related to the leachate pumping system and up to five (5) RFIs related to the leachate pumping electrical system.

BC will review up to two (2) requests for change orders related to the leachate pumping system and up to two (2) requests for change orders related to the leachate pumping electrical system.

BC has assumed 60 staff hours for responding to RFIs and reviewing requests for change orders.

Task 5 – Record Drawings

BC will prepare record drawings for the leachate pumping system and the leachate pumping electrical system based on red line drawings provided by the contractor documenting any changes during made construction.

Fee for Services

The fee for BC's services is shown in Table 1 below. BC will provide the services described in this proposal on a time and expenditure basis. BC's fee will not exceed $93,212 without authorization.

Table 1. Project Fee

Task	Staff	Hourly Billing Rate	Hours	Budget
Task 1 – Project Administration	Principal	$272	14	$3,808
	Project Manager	$208	48	$9,984
	Project Analyst	$98	30	$2,940
			Task Subtotal	*$16,732*
	Project Manager	$208	40	$8,320

Task 2 – Review Shop Drawings	Electrical Engineer	$228	24	$5,472
	Task Manager	$208	24	$4,992
	Civil Engineer	$208	8	$1,664
			Task Subtotal	*$20,448*
Task 3 – Visits During Construction	Principal	$272	60	$16,320
	Project Manager	$208	3	$624
	Task Manager	$208	60	$12,480
	Electrical Engineer	$228	2	$456
	Administrative Support	$98	16	$1,568
	Expenses			$2,000
			Task Subtotal	*$33,448*
Task 4 – Respond to RFIs and Change Orders	Project Manager	$208	24	$4,992
	Task Manager	$208	24	$4,992
	Electrical Engineer	$228	6	$1,368
	Civil Engineer	$208	6	$1,248
			Task Subtotal	*$12,600*
Task 5 – Record Drawings	Project Manager	$208	16	$3,328
	Task Manager	$208	32	$6,656
			Task Subtotal	*$9,984*
			Total	$93,212

Schedule for Services

BC's services are anticipated to begin in April/May 2024 and will be completed within 12 months.

Assumptions

BC's scope of services and fee are based on the following assumptions:

- The Contractor is responsible for maintaining red line drawings documenting any changes during made construction and providing such information to BC to incorporate onto record drawings.
- BC's effort for the review of Contractor submittals assumes review of the original submittal and up to one (1) resubmittal.
- BC's services do not include system start-up or commissioning support.
- Visits during construction will be performed by staff from BC's Orlando and Tampa offices.

If you have any questions, please contact me or Jim Nissen. We look forward to the opportunity to continue working with HDR on this important project for Hernando County.

Very truly yours,

Brown and Caldwell

Alan R. Kirschner
Vice President

cc: James Nissen, Brown and Caldwell
Anthony Andrews, Brown and Caldwell
Gina Nana, Brown and Caldwell

Hernando County Cell 4 Constructin

Project Size: 30 acres Project Duration: 48 weeks

Task #1: Laboratory Soils Testing and Shipping Expenses

A. Structural Fill	***Unit***	***Price***	***Cost***	
Classification (D2487)	1	$40.00	$40.00	
Proctor (D698)	1	$235.00	$235.00	
Moisture (D2216)	1	$60.00	$60.00	
Grain Size (HM) (D422)	1	$125.00	$125.00	
Atterberg (D4318)	1	$125.00	$125.00	
Shipping	1	$150.00	$150.00	
Total for SF				**$735.00**
B. Subbase Borrow 130,000 CY				
Classification (D2487)	1	$40.00	$40.00	
Grain Size (HM) (D422)	20	$125.00	$2,500.00	
Moisture Content (D2216)	52	$60.00	$3,120.00	
Atterberg (D4318)	20	$125.00	$2,500.00	
Proctor (D698)	20	$235.00	$4,700.00	
Perm Lab Remold (D5084)	10	$450.00	$4,500.00	
Shipping	35	$150.00	$5,250.00	
Total for CCB				**$22,610.00**
C. Protective Cover 100,000 CY	***Unit***	***Price***	***Cost***	
Classification (D2487)	1	$40.00	$40.00	
Grain Size (HM)(D422)	16	$125.00	$2,000.00	
Perm Lab Remold (D5084)	8	$450.00	$3,600.00	
Carbonate Content (D3042)	1	$550.00	$550.00	
Shipping	10	$150.00	$1,500.00	
Total for Protective Cover				**$7,690.00**
D. Drainage Material	***Unit***	***Price***	***Cost***	
Grain Size (HM) (C136)	1	$265.00	$265.00	
Perm (D2434)	1	$450.00	$450.00	
Shipping	1	$150.00	$150.00	
Total for Drainage Material				**$865.00**
E. Top Soil				
Classification (D2487)	1	$40.00	$40.00	
Organic Content	1	$550.00	$550.00	
PH	1	$550.00	$550.00	
Shipping	1	$150.00	$150.00	
Total for Top Soil Material				**$1,290.00**

Task #1 -Grand Total for Laboratory Soils Testing and Shipping **$33,190.00**

Task #2: Laboratory Geosynthetics Testing

A. HDPE Geomembrane 2,650,000 SF				
Thickness	27	$40.00	$1,080.00	
Tensile Properties	27	$75.00	$2,025.00	
Elongation	27	$75.00	$2,025.00	
Carbon Black	27	$70.00	$1,890.00	
Carbon Dispersion	18	$70.00	$1,260.00	
Sampling & Shipping	27	$250.00	$6,750.00	
Soil Shipping	4	$150.00	$600.00	
Interface (3 Loads) (Subbase/GCL, Subgrade/Textile, Textile/Subbase,Textile/GCL,GM/GCL, GM/GDM, GDM/PC)	7	$1,250.00 5,000,10,000, 20,000psf	$8,750.00	
Destructive Samples + Shipping	160	$65.00	$10,400.00	
Total for HDPE				**$34,780.00**

B. GCL 1,325,000 SF				
Bentonite Content	14	$130.00	$1,820.00	
Internal shear Strength 24hrs, 200psf	14	$375.00	$5,250.00	
Hydraulic conductivity	14	$325.00	$4,550.00	
Mass per unite of Textile upper and Lower	14	$100.00	$1,400.00	
Shipping	14	$250.00	$3,500.00	
Total for GCL				**$16,520.00**
C. Geotextile	***Unit***	***Price***	***Cost***	
Mass per unit area	1	$35.00	$35.00	
UV Resisitance 500hrs	1	$1,250.00	$1,250.00	
AOS	1	$150.00	$150.00	
Puncture Resistance	1	$110.00	$110.00	
Grab Strength	1	$75.00	$75.00	
Grab Elongation	1	$75.00	$75.00	
Trapezoidal Tear Strength	1	$75.00	$75.00	
Shipping	1	$250.00	$250.00	
Total for Geotextile				**$2,020.00**
D. Geocomposite 2,650,000 SF				
Density	27	$75.00	$2,025.00	
Thickness	27	$40.00	$1,080.00	
Carbon Black Content	27	$70.00	$1,890.00	
Tensile Strngth	27	$75.00	$2,025.00	
Transmissivity 100hrs, .02, 10,000 psf	6	$500.00	$3,000.00	
Ply Adhesion	54	$65.00	$3,510.00	
Textile				
Mass per unit area	54	$35.00	$1,890.00	
Permittivity	12	$115.00	$1,380.00	
Grab Strength	54	$75.00	$4,050.00	
Puncture Resistance	54	$110.00	$5,940.00	
Sampling & Shipping	27	$250.00	$6,750.00	
Total for Geocomposite				**$33,540.00**
E. High Strength Textile 1,325,000 SF				
Tensile Strength	14	$500.00	$7,000.00	
Mass per unit area	14	$35.00	$490.00	
Seam Strength	60	$325.00	$19,500.00	
Shipping	14	$250.00	$3,500.00	
Total for H.S.Textile				**$30,490.00**
Task #2 - Grand Total for Laboratory Geosynthetics Testing				**$117,350.00**
Task #3: Labor and Expenses				
Lead 48 weeks @ 60hrs per week, $73/hr	48	$4,380.00	$210,240.00	
CQA Project Mgr.: 2hrs./wk., 16 hrs./trip x 3	144	$110.00	$15,840.00	
Site Visit	3	$750.00	$2,250.00	
Lead Per Diem	48	$360.00	$17,280.00	
Truck and Mileage Lead	48	$750.00	$36,000.00	
Field Supplies	48	$100.00	$4,800.00	
Task #3 - Grand Total For Labor and Expenses				**$286,410.00**
Grand Total for Tasks #1, #2, and #3				**$403,760.00**
There will be need for at lease one assistant during Geosynthetics installation:				
Assistant CQA tech for 22 weeks, $68/hr	**22**	**$4,080.00**	**$89,760.00**	
Assistant CQA Hotel and Per Diem	**22**	**$1,250.00**	**$27,500.00**	
Assistant CQA Truck and Mileage	**22**	**$750.00**	**$16,500.00**	

November 03, 2023

Mr. Mark Roberts, P.E.
HDR
76 South Laura Street, Suite 1600
Jacksonville, FL 32202

Subject: Proposal to Perform a GPR Investigation
NWMMF Cell 4: Phase II Investigation
Brooksville, Florida
GeoView Proposal Number: 10827p

Mr. Roberts,

The purpose of this letter is to transmit a proposal to complete a geophysical investigation at the subject site. This proposal is in response to your request for a proposal made during your recent conversations with our office. GeoView Associates, Inc. (GeoView) appreciates the opportunity to provide our services on this project. We look forward to hearing from you soon.

Sincerely,

GEOVIEW ASSOCIATES, INC.

Michael J. Wightman, P.G.
President
Florida Professional Geologist Number 1423

Enclosure

Proposal

This document shall serve as a proposal for work to be performed by GeoView Associates, Inc. (GeoView) for HDR.

Description of Site

The project site is referred to as the NWMMF Cell 4: Phase II Investigation and is located at 14450 Landfill Road in Brooksville, Florida. The investigation will be completed in two areas. Area 1 is a 10 to 11 acre area within Cell B and is shown on Figure 1 (page 5). Area 2 is a 150 foot (ft) by 150 ft area and is around GV-14 (a GPR anomaly that was identified by a previous survey at the project site) and is shown as Figure 2 on page 6.

The survey areas are reported to be accessible to the geophysical investigation. The purpose of the GPR survey will be to determine the presence and location of potential karst (sinkhole) features that may be present with the boundaries of the project site.

Scope of Work

GeoView will provide geophysical surveying services at the project site. The purpose of the GPR survey will be to determine the presence and location of features, as indicated by the survey results that are indicative of potential karst (sinkhole) activity.

The geophysical survey will be conducted using ground penetrating radar (GPR). The GPR survey will be conducted by towing a Mala GPR system behind an all-terrain vehicle. A 250-megahertz antenna will be used for the investigation. The GPR survey will be conducted along a series of perpendicular transects spaced 20 feet (ft) apart. Positioning will be recorded using an integrated Trimble Geo7x GPS system. The GPR data will be digitally recorded for both analysis and archiving purposes. It is estimated that the investigation will take 2 days to complete.

The ability of GPR to collect interpretable information at a project site is limited by the attenuation (absorption) of the GPR signal by underlying soils. Once the GPR signal has been attenuated at a particular depth, information regarding deeper geological conditions will not be obtained.

Presentation of Results

Results of the GPR investigation will be presented as a final report. As part of the final report an ACAD site drawing will be provided which indicates the location, lateral extent and apparent centers of any areas where karst features are suspected. Two independent and confidential final reports will be submitted for the two areas identified in Figures 1 and 2 within 7 days of completion of the fieldwork.

Compensation

Cost to complete the survey will be $4,250. This price is inclusive of all charges associated with the project. Unless otherwise agreed upon, GeoView shall be compensated for all services within 30 days of the invoice date. GeoView shall be paid in full regardless of whether the results of the geophysical survey are what HDR anticipated. If it is determined during the survey that the geophysical survey will not achieve the objectives of the project, HDR will immediately be notified. If a decision is made to discontinue the survey, only charges for time and materials costs to that point will be submitted.

These prices are based upon GeoView being able to access the site during normal business hours, Monday through Friday. It is also based upon the assumption that no site-specific training or drug testing will be required. If there are any such requirements, additional costs will be incurred.

Requirements of Client

HDR will provide a scaled map and digital file, if available, of the project site showing the boundaries of the project site, areas of specific concern and pertinent landmarks. HDR will be responsible for the coordination of site access, traffic control, clearing of onsite obstructions or any other logistical consideration necessary to conduct the survey.

Limitations

The objective of the geophysical survey is to determine the presence and lateral extent of sinkhole features. The geophysical response of these features may range from very good to marginal depending upon on the physical characteristics of the near surface soils. Accordingly, these features may not be fully resolvable using GPR. GeoView shall conduct the geophysical survey using the most “up-to-date” geophysical equipment in a manner consistent with the level of care and skill ordinarily exercised by members of the geophysical profession practicing in the same locality under similar conditions.

It is recognized that all geophysical test methods are non-intrusive and that confirmation of the significance of any identified feature must be determined by a qualified geotechnical engineer.

Other Terms and Conditions

Additional Insured: If requested, HDR will be named as an additional insured with respect to the services to be performed under this agreement.

Confidentiality: GeoView shall not directly or indirectly disclose to any third person information regarding the results of the geophysical investigation prior to obtaining written permission from HDR.

Agreement: This agreement represents the entire agreement between the parties and may only be modified in writing signed by both parties.

Governing Law: This agreement shall be deemed to have been made in the place of performance of the Geophysical Services and shall be governed by, and construed in accordance with the laws of the state in which the geophysical services were provided. Any controversy or claim arising out of this agreement, or breach thereof, shall be settled by binding arbitration administered by the American Arbitration Association under its Construction Industry Arbitration rules. Judgment on the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof.

Indemnity: GeoView agrees to indemnify, protect and hold harmless HDR from and against all liabilities, claims or demands of every kind of injury, including death, or damages to any person or property related in any way to GeoView's performance of this agreement, except to the extent such liabilities, claims or demands are caused by the negligence or willful misconduct of HDR.

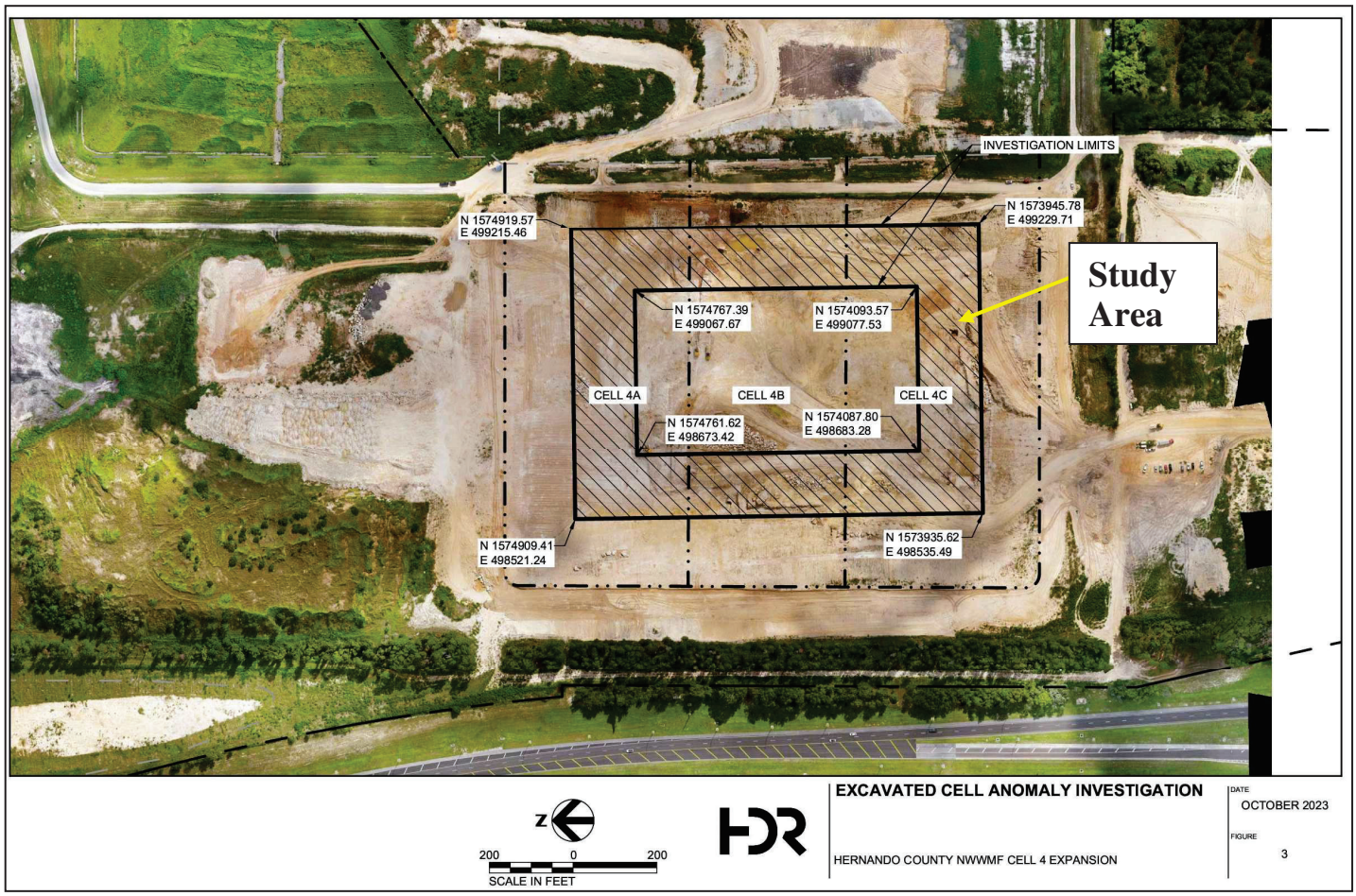


Figure 1 – Area 1 GPR Study Area

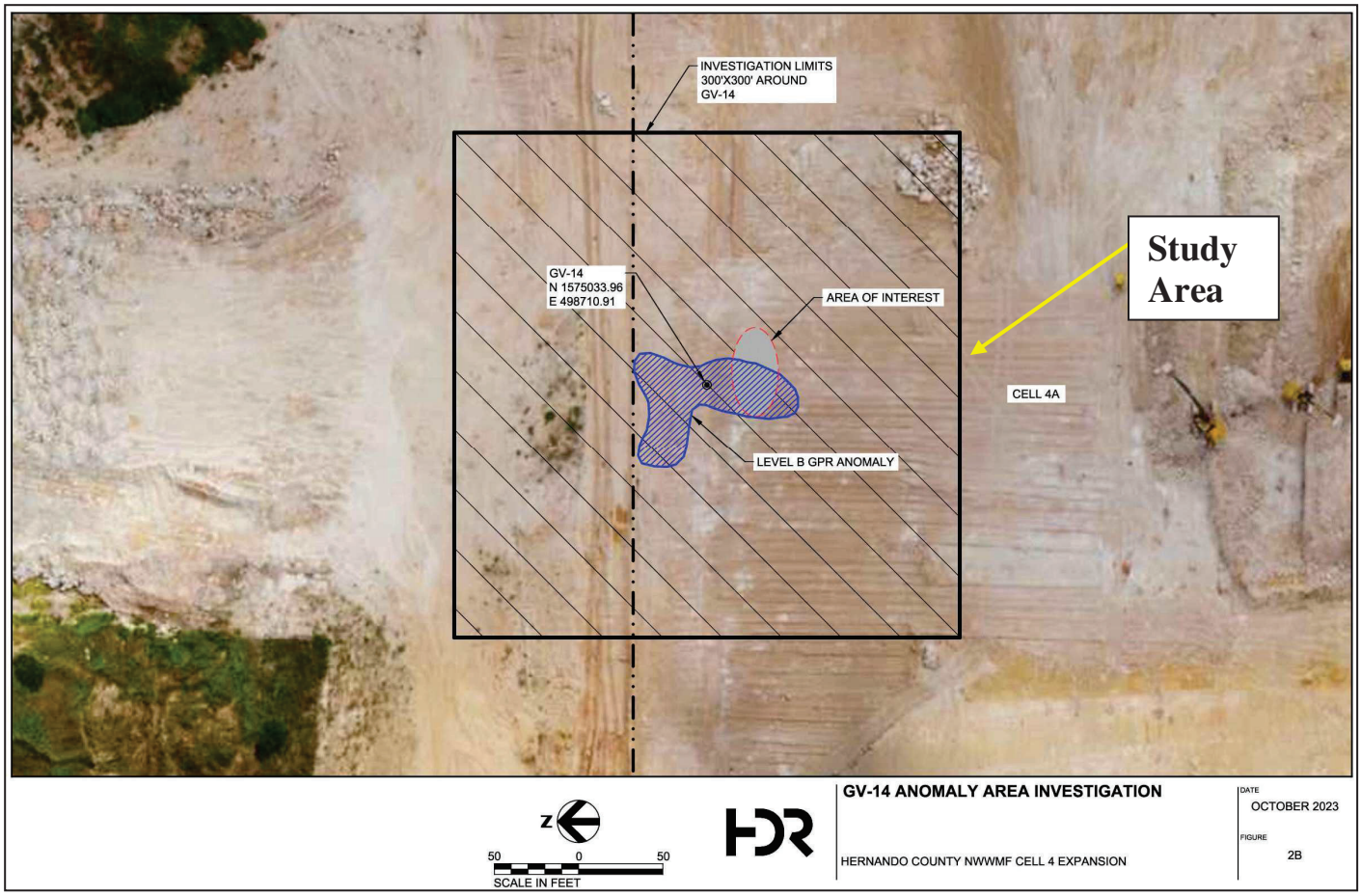
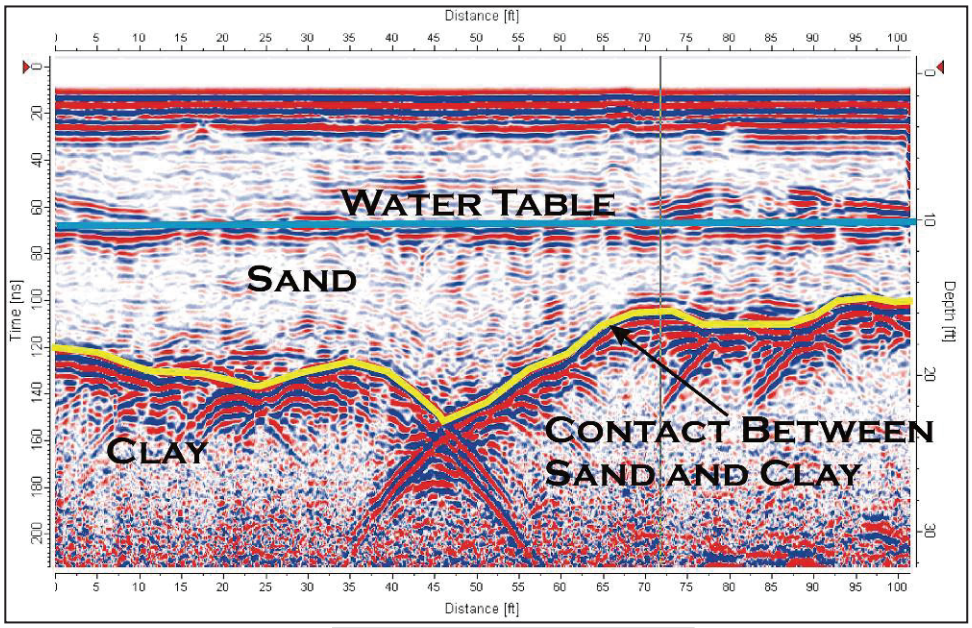


Figure 2 – Area 2 GPR Study Area

Sample Data Output and Equipment Pictures



Example GPR Data

Collection of GPR Data

GEOVIEW ASSOCIATES, INC.
PROPOSAL ACCEPTANCE SHEET

Project Name:	**NWMMF Cell 4: Phase II Investigation**
Project Location	**Brooksville, Florida**
GeoView Proposal #:	**10827p**
Proposal Date:	**November 03, 2023**
Description of Services	**Provide a GPR Survey**
Project Cost:	**$4,250**
Payment Terms:	**Payable within 30 days of receipt of invoice**

CHARGE INVOICE TO THE ACCOUNT OF:

Client: HDR
Address: 76 South Laura Street, Suite 1600
Jacksonville, FL 32202
Attention: Mr. Mark Roberts, P.E.
Phone (Office): (904) 598-8979 Phone (Cell): (904) 234-0272
Email: Mark.Roberts@hdrinc.com

FOR APPROVAL OF CHARGES:

Firm: _____
Address: _____
Phone No.: _____ Fax No: _____
Attention: _____

Special Instructions and/or Mutually Agreed Upon Changes to the Proposal:

_____

In witness thereof, the parties hereto have made and executed this Agreement

Client:	GeoView Associates, Inc.
	
Signature	
By:	By: Mike Wightman, P.G.
Title:	Title: President
Date Signed:	Date Signed: November 03, 2023

General Description of Geophysical Methods

Ground Penetrating Radar

Ground Penetrating Radar (GPR) consists of a set of integrated electronic components that transmits high frequency (200 to 2600 megahertz [MHz]) electromagnetic waves into the ground and records the energy reflected back to the ground surface. The GPR system consists of an antenna, which serves as both a transmitter and receiver, and a profiling recorder that both processes the incoming signal and provides a graphic display of the data. The GPR data can be reviewed real time as the data is collected and later reviewed using proprietary GPR data analysis software. GeoView uses GSSI and Mala GPR system. Geological characterization studies are typically conducted using a low to medium frequency range GPR antenna.

A GPR survey provides a graphic cross-sectional view of subsurface conditions. This cross-sectional view is created from the reflections of repetitive short duration electromagnetic (EM) waves that are generated as the antenna is pulled across the ground surface. The reflections occur at the subsurface contacts between materials with differing electrical properties. The electrical property contrast that causes the reflections is the dielectric permittivity that is directly related to conductivity of a material. The GPR method is commonly used to identify such targets as underground utilities, underground storage tanks or drums, buried debris, voids or geological features.

The greater the electrical contrast between the surrounding earth materials and target of interest, the greater the amplitude of the reflected return signal. Unless the buried object is metal, only part of the signal energy will be reflected back to the antenna with the remaining portion of the signal continuing to propagate downward to be reflected by deeper features. If there is little or no electrical contrast between the target interest and surrounding earth materials it will be very difficult if not impossible to identify the object using GPR.

The depth of penetration of the GPR signal is very site specific and is controlled by two primary factors: subsurface soil conditions and selected antenna frequency. The GPR signal is attenuated (absorbed) as is passes through earth materials. As the energy of the GPR signal is diminished due to attenuation, the energy of the reflected waves is reduced, eventually to the level that they can no longer be resolved by the GPR system. The more conductive the earth materials, the greater the GPR signal attenuation, hence a reduction in signal penetration depth. Typical soil conditions that severely limit GPR signal penetration are near-surface clays and/or organic materials.

The depth of penetration of the GPR signal is also reduced as the antenna frequency is increased. However, as antenna frequency is increased the resolution of the GPR data is improved. Therefore, when designing a GPR survey a tradeoff is made between the required depth of penetration and desired resolution of the data. As a rule, the highest frequency antenna that will still provide the desired maximum depth of penetration should be used.

A GPR survey is conducted along survey lines (transects) that are measured paths along which the GPR antenna is moved. Electronic distances are maintained within the system to allow for a correlation between the GPR data and the position of the GPR antenna on the ground.

For geological characterization surveys, the GPR survey is conducted along a set of perpendicularly orientated transects. The survey is conducted in two directions because subsurface features such as sinkholes are often asymmetric. Spacing between the transects typically ranges from 10 to 50 feet. Closely spaced grids are used when the objective of the GPR survey is to identify all sinkhole features within a project site. Coarser grids are used when the objective is to provide a general overview of site conditions. After completion of a survey using a given grid spacing, additional more-closely spaced GPR transects are often performed to better characterize sinkhole features identified by the initial survey. This information can be used to provide recommended locations for geotechnical borings.