



COASTLAND

CIVIL ENGINEERING - CONSTRUCTION MANAGEMENT - BUILDING DEPARTMENT SERVICES

EXHIBIT C

SCOPE OF SERVICES

Amendment No. 2 - Additional Design Services for the Cascade Shores Community Leach Field Project

This amendment proposal covers the additional geotechnical engineering services, attendance at two public meetings and one meeting with the Regional Water Quality Control Board. This proposal also includes additional topographic survey services to support the project design.

Task 1 – Project Management and Meetings

Additional services under this Task include:

Coastland and NV5 will attend up to two public meetings and one meeting with regulatory agencies and the County to provide technical support and discuss the project design. We have also included time to discuss the additional geotechnical efforts with the County via conference call.

Task 2 – Geotechnical Investigation

Additional services under this Task include:

NV5 will perform additional subsurface investigations at various locations across the project, perform laboratory testing, and prepare a geotechnical slope stability report with recommendations regarding the global stability of the sites and safeguarding the project. Based on site observations and their understanding of the project, NV5 proposes the following engineering services:

SUBSURFACE INVESTIGATION

Leach Field Drainage Improvements

NV5 will perform a subsurface investigation surrounding the proposed leach field to characterize shallow soil, rock and groundwater conditions to the maximum depth excavated for design of subdrains around the field. The subsurface investigation will include the excavation of 6 to 8 exploratory trenches surrounding the proposed leach field. The trenches will be excavated to depths up to 8 feet below the ground surface, or to refusal, if encountered at shallower depths. Excavated soil will be placed back into the exploratory trenches but will not be compacted. Recompaction of the trenches should be performed during grading for the project. For cost estimating purposes, we have assumed one full day of excavation services. During the field investigation, an NV5 engineer or geologist will record the observed soil and shallow groundwater conditions.

Pump Station Slope Stability

NV5 will perform a subsurface investigation in the proposed pump station location. Currently, there are holding tanks in the vicinity of the new system that may be able to be reused. The subsurface investigation will include the advancement of 3 to 4 hand auger

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borings surrounding the proposed pump station location and on the slope below the pump tanks. The hand auger borings will be drilled to depths up to 8 feet below the ground surface, or to refusal, if encountered at shallower depths. Upon completion, drill cuttings will be placed back into the boring holes. A staff engineer/geologist will log the subsurface soil conditions encountered and collect relatively undisturbed soil samples using a hand actuated slide sampler.

Prior to the field investigation, a representative of NV5 will visit the pump station site to mark the proposed exploratory boring locations for Underground Service Alert (USA). If requested, we can revise the proposal to retain a private utility locating service to supplement the USA clearance to reduce the risk of damage to underground utilities. NV5 will not be responsible for damage to subsurface utilities that were not marked or were improperly marked prior to the investigation.

Leach Field Slope Stability

We will perform a slope stability study of the western portion of the subject property to evaluate potential impacts on the property and proposed leach field. We propose performing additional surficial reconnaissance mapping as well as advancing two borings up to 100 feet for soil/rock classification, strength testing, and groundwater elevations. The borings will be located below the proposed leach field. The borings will be advanced with a truck mounted hollow stem auger drill rig. When resistant rock is encountered, the drill rig will be converted to mud rotary with rock coring tooling to collect relatively undisturbed continuous rock core samples for Rock Quality Designation (RQD) documentation.

A field engineer/geologist will collect both relatively undisturbed and disturbed soil samples from each exploratory boring. Relatively undisturbed soil samples will be collected with a standard penetration test (SPT) sampler and a 2.5-inch diameter (inside diameter) split spoon barrel sampler equipped with brass liner tubes. Generally, soil samples will be collected at the following depths below the existing ground surface: 0 feet, 2.0 feet, 5 feet, 10 feet, and continuing on five-foot intervals, or change in geologic material, until conversion to rock core upon refusal with the hollow stem auger. Rock cores will be advanced on 3-5-foot continuous runs until the appropriate depth and RQD has been established. Additional soil samples may be collected and/or the sample intervals may be changed depending upon the soil conditions encountered. The soil samples will be labeled, sealed, and transported to a laboratory facility where selected samples will be tested to determine their engineering material properties. If the groundwater table is encountered, the depth to groundwater below the existing ground surface will be measured.

Following the advancement of the borings, we will install slope inclinometers/piezometers and implement a routine monitoring regime to record fluctuations in groundwater/seepage and facilitate future monitoring of the slope below the leach field site. The slope indicator system utilizes a gyroscopic measuring tool that measures the deviation from vertical. The slope inclinometer casing is manufactured with continuous longitudinal slots on the interior surface, which serve as guides to direct the slope indicator tool. During monitoring, the slope indicator tool is lowered into the casing and tilt measurements are made at routine intervals and recorded. Comparison of the tilt of the slope inclinometer casing recorded over time can reveal slope movement and allow identification of the depth of a failure



surface. The inclinometer casing installation will be completed with the placement of a locking cap well monument that will be grouted in place at the ground surface.

Prior to performing the drilling investigation below the proposed leach field site, preparations for site access should be performed. Given the existing slopes of the site, drill rig access to the drilling locations may be restricted. Clearing and rough grading may be necessary to allow access and maneuverability to the drill locations.

LABORATORY TESTING

Laboratory tests will be performed using ASTM International (ASTM) and Caltrans methods as guidelines. Depending on the subsurface conditions encountered, we anticipate that laboratory testing may include:

- D1140, 200 Mesh Wash
- D2166, Unconfined Compressive Strength (rock and soil)
- D2216, Moisture Content
- D2487, Unified Soil Classification System
- D2844, Resistance Value
- D2937, Density
- D3080, Direct Shear Strength
- D4318, Atterberg Limits
- D4829, Expansion Index

In addition to the laboratory testing listed, we will send select soil samples to a contract laboratory to be assessed for clay mineralogy properties. Such testing may include X-ray diffraction and petrographic analysis. Examining clay mineralogy will aid in determining the location of contacts between geologic units and for confirming the absence or presence of smectite in significant clay lenses which may be encountered. Laboratory test results will be used to analyze slope stability and to evaluate alternative mitigation approaches.

DATA ANALYSIS AND ENGINEERING

Based on the results of the subsurface investigation and laboratory test results, NV5 will perform will perform a computer assisted stability analysis of the present slope configurations at and below the proposed pump station and leach field sites to estimate factors of safety for slope stability. Recommendations for setback and limitations to the project will be determined following this study.

GEOTECHNICAL MEMORANDUM OF FINDINGS

Following completion of the laboratory testing and slope stability analysis, NV5 will prepare a Memorandum of Findings that will include the following:

- Exploratory boring logs.
- Site plan showing slope configuration and boring locations.
- Description of soil/rock conditions encountered.
- Results of slope stability analysis.
- Discussion of slope stability analysis results.



- Recommendations to mitigate slope hazards at the proposed pump station and leach field sites.
- Discussion and recommendations regarding the suitability of the site.

The slope stability analysis is scoped to monitor and analyze global stability of the slopes, minor sloughing of cut slope faces may continue to occur.

MONTHLY MONITORING

NV5 will perform monthly monitoring of the slopes at the pump station site and leach field sites, including the slope inclinometers, for the first twelve months following installation. Measurements will be obtained and summarized in a monthly letter submitted to the Nevada County Sanitation District. Following the first twelve months of monitoring, NV5 will provide a proposal for continued monitoring to the Nevada County Sanitation District.

Task 3 – Project Surveys

Additional services under this Task include:

Dundas Geomatics will provide additional topographic survey of the leach field site and identify additional features discovered on the site during the initial geotechnical investigations including an old well and an intermittent water course to the northeast of the leach field area.

Dundas will also survey one large cross section from Banner Quaker Hill Road, through the project site and down to Gas Canyon Creek Road. It is assumed the County will provide a written right of entry letter to Dundas to perform the necessary survey on the property to the south of the leach field parcel.

Task 4 – As-Needed Permitting Support

No additional work under this task.

Task 5 – Preliminary Design Report/Alternatives Analysis

No additional work under this task.

Task 6 – 50% PS&E Submittal

No additional work under this task.

Task 7 – Final PS&E Submittal

No additional work under this task.

Task 8 – Bid Phase and Contract Award Support

No additional work under this task.



Task 9 – Construction Phase Services

No additional work under this task.

Task 10 – SWRCB SRF Coordination

No additional work under this task.

Project Fee

Based upon our described scope of work, we propose to provide these additional professional services on a time and materials basis for a not to exceed amount of \$142,335. The total amount we have specified is only for our described Scope of Work. If you request work to be performed outside the scope of work or if the scope of work changes, we reserve the right to negotiate the cost for the extra work.

This amendment is in addition to our current contract in the amount of \$712,195 for a new not to exceed amount of \$854,530.

We greatly appreciate the opportunity to serve the County on this project. We are prepared to begin work upon authorization. Please let me know if you have any questions.





WORK ESTIMATE - AMENDMENT NO. 2

Cascade Shores Community Leach Field Project		Additional Design Services														County of Nevada					
Task Information		Billing Classification & Rate										Subconsultants					Hours & Cost				
TASK		Principal-in-Charge	Project Manager	Supervising Engineer	Senior Engineer	Assistant Engineer	Junior Engineer	Sr. Engineering Tech	Admin	Construction Manager	Construction Inspector	Dundas Geomatics	NV5	NEXGEN	Foothill Associates	BACC	TOTAL HOURS	TOTAL FEE			
		\$195	\$185	\$185	\$155	\$135	\$125	\$135	\$85	\$160	\$135										
1 Project Management and Meetings																					
	Public Meetings (2) including Preparation & Follow-Up		8		8								\$4,025				16	\$6,745			
	Meeting with State (1) including Preparation & Follow-Up		5		8								\$1,725	\$1,150			13	\$5,040			
	Subtotal																29	\$11,785			
2 Geotechnial Investigation																					
	Leach Field Drainage Improvements		1		2								\$5,578				3	\$6,073			
	Pump Station Slope Stability		1		2								\$8,338				3	\$8,833			
	Leach Field Stability		4		6								\$98,900				10	\$100,570			
	Subtotal																16	\$115,475			
3 Site Surveys																					
	Additional Leach Field Topographic Survey				2			4				\$6,325					6	\$7,175			
	Cross Section				2							\$7,590					2	\$7,900			
	Subtotal																8	\$15,075			
4 As-Needed Permitting Support																					
																	0	\$0			
	Subtotal																0	\$0			
5 Preliminary Design Report/Alternatives Analysis																					
																	0	\$0			
	Subtotal																0	\$0			
6 50% Plans, Specifications & Estimate (PS&E) Submittal																					
																	0	\$0			
	Subtotal																0	\$0			
7 Final Submittal																					
																	0	\$0			
	Subtotal																0	\$0			
8 Bid Phase & Contract Award Support																					
																	0	\$0			
	Subtotal																0	\$0			
9 Construction Phase Services																					
																	0	\$0			
	Subtotal																0	\$0			
10 SWRCB SRF Coordination																					
																	0	\$0			
	Subtotal																0	\$0			
Direct Costs (repro, mileage, etc.)																					
	Revised Total Cost	0	19	0	30	0	0	4	0	0	0						53	\$142,335			