# EXHIBIT 1
# Scope of Services
# Routine Water Quality Monitoring and Reporting

The Scope of Services for this contract is presented in this exhibit.

## TASK 1. SAMPLING ACTIVITIES

### *Health and Safety*

Prior to initiating sampling activities, GLA will submit the contract Health and Safety Plan and Corporate Injury and Illness Prevention Plan along with a letter to the SWMD that certifies that these plans are in compliance with Section 1509 and 1510 of the California Occupational Safety and Health Administration (Cal-OSHA) construction safety orders. All on-site field activities will be conducted using the "buddy system", which consists of a minimum of two people on-site during sampling events. Of note, all field sampling personnel have received 40-hour HAZWOPER training, receive annual 8-hour HAZWOPER refresher training, and undergo annual medical monitoring to comply with HAZWOPER regulations.

### *Monitoring Program*

Approximately one to two weeks prior to mobilization for each sampling event, the GLA Team will order sample containers for the appropriate landfills from our laboratory, Pace Analytical (Pace). The laboratory will be notified of the number of monitoring points and the appropriate analytical parameters to be analyzed for each sample, and the laboratory will be directed to provide the appropriate sample containers (including extra containers for collection of appropriate equipment blanks). The GLA Team's sampling personnel will ensure that all sample bottles are "clean-certified" from the laboratory or supplier. Sample containers that appear dirty, used, or otherwise compromised will not be used. Sample bottles containing preservatives will be appropriately marked. Sample shipping containers, coolers, ice packs, and any other materials that may contact sample bottles will be regularly inspected for cleanliness, durability, and functionality. Damaged coolers will not be used, as they may compromise sample integrity. All containers will be stored in an area that is free from dust and exposure to organic chemicals.

Some of the landfill sites in this program have groundwater monitoring points located on adjacent properties or in sensitive or dangerous areas that require notification before sampling. The GLA Team will provide notification to the appropriate parties, including

property owners adjacent to the Adelanto Disposal Site and Apple Valley Sanitary Landfill prior to sampling. Some of the monitoring wells for the Mid-Valley and Milliken landfills are located in public rights-of-way and require either a "Right of Entry Agreement" or "encroachment permits" from the local city; the encroachment permits typically require preparation and submittal of traffic control plans for review by the city engineer. All notifications will include an estimated sampling schedule and the name and telephone number of the GLA Team's Project Manager and Field Services Task Manager, as well as a reference to SWMD's Project Manager. GLA assumes that if and when sampling is needed in an environmentally sensitive area (e.g., desert tortoise habitat), or if biological monitoring is necessary, this will be provided by the County under a separate contract.

## *Groundwater Sampling*

Samples will be collected from each scheduled monitoring point and these samples will be analyzed for the monitoring parameters specified in the individual site M&RPs. Groundwater samples will be collected following the procedures outlined in the Practical Guide for Groundwater Sampling (Barcelona, et al., 1985), RCRA Groundwater Monitoring Technical Enforcement Guidance Document (U.S. EPA, 1986), and Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures (Puls and Barcelona, U.S. EPA, 1995). Since several wells do not have dedicated pumps and must be sampled with portable equipment (e.g., decontaminated bailers, pumps, or HydraSleeves™), the actual sampling method will vary depending on the site, the nature of any dedicated sampling equipment, and the monitoring point to be sampled.

Upon arrival at a landfill site, each well will be inspected and any well-head problems will be noted on the field log. Significant problems with the well-head, such as those that prevent sampling or compromise the integrity of the well, will be reported to SWMD (verbally and in writing) within 24 hours of observation. Prior to sampling a well, the depth to groundwater will be measured to the nearest 0.01 foot from an established well datum (e.g., top of casing) using either a decontaminated electric sounding device or bubbler depending on the nature of any dedicated equipment present in the well. The depth to water will then be used to calculate the water surface elevations in the wells, and to calculate appropriate purge volumes for those wells not equipped with low-flow purge equipment. During each sampling event, to evaluate groundwater flow conditions beneath the landfills, groundwater depths will be measured on the same day in all accessible site wells and piezometers wherever possible.

Well purging will be accomplished using existing dedicated electric submersible and bladder pumps, or decontaminated pumps or bailers. The GLA Team will utilize a battery-powered winch for bailing, and, if applicable, low-flow purging and sampling techniques in wells fitted with dedicated pump systems.

Of significant importance is that each pump has a unique set of controller settings (frequency in hertz for Grundfos pumps, and pressure, refill, and discharge settings for bladder pumps) to ensure optimal pumping without damaging the pump or its components. During each sampling event, GLA will start a pump using the controller specifications recorded during the previous sampling event, and slowly adjust the controller settings, if needed, to meet low-flow purging requirements. In this way, GLA reduces the incidence of burning out a motor by over-pumping or damaging a bladder by over-pressurizing it.

Purging rates for all wells with pumps will be low enough so as not to induce turbulent flow within the well. As a well is purged, indicator parameters (pH, temperature, specific conductance, dissolved oxygen, salinity, and turbidity) will be monitored using a Horiba water-quality monitoring instrument (or equivalent). Indicator parameters will be recorded until they have stabilized to within 10 percent of the preceding measurements and show no discernible upward or downward trend. Flow-through cells will be used to measure field parameters at wells that are purged with pumps.

For sampling locations where pumps are not used (e.g., wells without pumps where bailers or HydraSleeves™ are used), a sample will be collected in a clean container, the field instrument probe will be placed in the container, and appropriate field measurements will be recorded on a sample collection log. Where appropriate, water that is purged from each well will be collected in 55-gallon steel drums with screw top or locking lids. The GLA Team will provide drums throughout the course of this contract and will regularly inspect each drum to ensure that it is in good repair. Any drum found to be leaking or without an adequate seal will be replaced.

The GLA Team recognizes that many of the field parameters (such as pH and dissolved oxygen) have a very short holding time, and therefore careful calibration of the field instruments must be maintained so that accurate results can be obtained in the field. All instruments will be calibrated daily in accordance with the manufacturer's specifications. If instrument drift is suspected at any time during the day, the instrument will be recalibrated. If calibration cannot be achieved, the instrument will be removed from service until factory calibration is completed or repairs are made.

Sampling from wells with dedicated sampling apparatus will be conducted by slowing the pumping rate, as appropriate, and allowing the discharge water to flow gently into appropriate sample containers. For wells that have very slow recharge rates (i.e., more than two hours to recover to 80 percent of its original water level), the well will be purged dry and a sample will be collected after the water level has recovered to within approximately 80 percent of its original level. For bailed wells, the bailer will be slowly lowered into the water column to minimize disturbance to the collected sample, and a bottom emptying device will be inserted into the bottom of the bailer to release the sample. For wells equipped with HydraSleeve™ samplers, the HydraSleeve™ (in some

cases more than one sleeve is needed to produce the required sample volume) will be extracted from the well using a Quick-E bailer electronic winch to ensure that the samplers are not agitated during retrieval, and the water will be transferred into the sample containers. After water is discharged from a HydraSleeve™, the device will be discarded and replaced with a new HydraSleeve™ (or a series of HydraSleeves™ to ensure sufficient sample volume). The samplers will be equipped with proper stainless steel weights to ensure that water quality is not affected by the HydraSleeve™ apparatus.

Well pumps have a finite life span and require periodic repair or replacement. As a value-added service, each member of GLA's sampling crew is adept at diagnosing and repairing the pumps in the SWMD's monitoring network. If a pump is found to be faulty, the sampling crew will remove and inspect the pump. If possible, the pump will be repaired immediately and then decontaminated before it is reinstalled in the well so that sampling can resume, minimizing project delays and remobilization to the site. If a pump cannot be repaired, GLA will notify the County immediately so that the County can develop a plan to repair or replace the pump in a timely fashion. In these cases, the well may be sampled purged and sampled with a non-dedicated bailer, disposable bailer, or a HydraSleeve™ sampler depending on well conditions, so that samples can be collected in a single mobilization; this procedure will also assure that all samples from a specific monitoring period are collected within the required 30-day sampling period.

All groundwater samples will be poured from the pump discharge, bailer, or HydraSleeve™ directly into the sample containers by pouring the sample down the sides of the container with as little turbulence as possible. Sampling containers will be filled in order of volatility (volatile organic compounds first, then semi-volatile organic compounds, pesticides, herbicides, general chemistry, and metals). Vials for volatile organic analyses will be filled completely with no head space, capped, turned upside down, and tapped to check for air bubbles. All metals samples will be field-filtered during sample collection.

Trip blanks will accompany sample containers from the laboratory, through field operations, and return to the laboratory as a QC check to evaluate if contamination has been introduced from the sample containers or laboratory water. One trip blank will accompany each cooler that contains samples for volatile organic testing. For sites that have one or more wells without dedicated pump systems, equipment blanks will also be collected and will consist of distilled, deionized, reagent-grade laboratory water passed through representative sampling equipment (e.g., bailers and bottom emptying devices) as a test of equipment decontamination. One equipment blank will be collected per monitoring event at each site that is not equipped with dedicated sampling devices. GLA understands that during the 2018-2023 contract, the County approved the removal of field blank and duplicate samples from the QA/QC program. While our proposal reflects

those developments, GLA believes it is in the County's best interest to reintroduce these QA/QC samples to allow for more accurate data validation and more defensible data, should the County's data come into question. Based on our experience with this program, and the ability of the laboratory to provide adequate internal QA/QC, duplicate samples should be collected at a frequency of up to 10 percent per monitoring event. Field blanks should be collected at a frequency of one per site per day by pouring laboratory provided reagent-grade water directly into a set of sample vials as a test of site-specific environmental conditions.

After a sample has been collected, it will be stored in a field ice chest where ice or "blue ice" packs will be used to cool and maintain the samples at a temperature of approximately 4°C. To prevent breakage, bubble wrap or an alternative material will be placed around glass containers so they do not touch each other or the side of the shipping container to reduce the chance of breakage. Each sample will be cataloged on appropriate chain-of-custody documentation after it has been collected, and these chain-of-custody records, and other appropriate paperwork, will be sealed in a plastic bag taped to the lid of the shipping container and will accompany each sample to the analytical laboratory. It is anticipated that samples will be provided to the laboratory courier at the end of each sampling day, and the field sampler will be responsible for the care and custody of the samples until they are shipped or otherwise delivered to the laboratory custodian.

As discussed in the following sections, GLA will review analytical data promptly upon receipt of certificates of analysis, and will identify any VOCs or other compounds that might indicate a landfill release. Analytical results that suggest a tentative indication of a release will be compared to results from QA/QC samples collected during the same sample collection event. If analytes in question are not present in the QA/QC samples, the County will be notified and retest sampling will be performed in accordance with the site-specific WDRs as soon as possible, and no longer than the required 30 days following the initial sampling event.

Sites in the Lahontan Region that have been affected by VOCs are required to containerize their purge water. During this review, the GLA Team will develop a listing of wells (and thereby the purge water drums) at the Apple Valley Sanitary Landfill, Lenwood-Hinkley Sanitary Landfill, and Victorville Sanitary Landfill that contain VOCs, the VOC concentrations measured and the approximate purge volumes. Approximately twice each year, the GLA Team will arrange for disposal of purge waters that contain detectable concentrations of VOCs. Typically, the VOC-impacted purge water can be broadcast on a lined portion of the landfill or it is disposed of at an off-site wastewater treatment facility. Purge waters that do not contain VOCs will be disposed of at the site in a manner that does not impact the monitoring well or other landfill structures or

erode landfill cover soils or native soils. Purge water will not be allowed to come into contact with surface water.

## *Surface Water Sampling*

Surface water sampling is required at all sites in the Santa Ana Region and at select sites in the Lahontan and Colorado River Basin regions. These samples will be collected any time that surface water runoff is observed during the routine monitoring event. Historically, owing to the generally arid conditions typical of most of the SWMD sites, surface water samples can only be collected on a regular basis at two sites. As a result, quarterly samples are only anticipated from the designated sampling locations along the Santa Ana River adjacent to the Colton Sanitary Landfill and during the second, third, and fourth calendar quarters from Shake Creek at the toe of Heaps Peak Disposal Site. Surface water samples will be collected from the fast-moving portion of the creeks, rather than from stagnant water, and samples will be collected without disturbing the creek bottom or otherwise changing the observed flow conditions and sediment load of the creek. Sample bottles will be filled to minimize air space in the sample containers. After the samples are collected, they will be sealed, labeled, and placed in the cooler for transport to the laboratory.

All surface water samples will be collected and transported using the same procedures and chain-of-custody protocols outlined above for groundwater samples.

## *Leachate Sampling*

Leachate samples will be collected from lined waste cells at the Mid-Valley, San Timoteo, Barstow, and Victorville landfills in October of each year. GLA understands that the Landers landfill is undergoing expansion, and the new lined cell will contain a leachate collection and recovery system (LCRS). After waste has been placed in the new cell, GLA will collect leachate samples if leachate accumulates in the LCRS sump that will be constructed for the new cell.

Leachate samples will be tested for the compounds listed in 40 CFR Part 258 Appendix II, which comprise the constituents of concern. Analytes that had not been previously detected in leachate samples from the respective waste cell will then be re-tested in the sample to be collected six months later (in April). If the analytical results from April confirm the October results, the compound will be added to the site's detection monitoring parameter list. Leachate samples will be collected at the Heaps Peak Disposal Site on a quarterly basis, and tested for the site-specific leachate monitoring parameters.

Leachate samples will be collected by opening a sampling port and decanting the leachate directly into laboratory-supplied containers. Following collection, the leachate sample containers will be sealed, labeled, and placed in a chilled, laboratory-supplied

cooler for transport. Leachate samples will be cataloged and transported using the same chain-of-custody protocols outlined above for groundwater.

## *Landfill Gas Condensate Sampling*

As part of this contract, samples of landfill gas condensate will be collected from the Colton, Mid-Valley, Milliken, and San Timoteo Sanitary Landfills, and the Yucaipa Disposal Site. Landfill gas condensate samples will also be collected at the Landers Sanitary Landfill after the system becomes active. These samples will be collected from condensate collection ports fitted with a labcocks valve that have been installed in the condensate collection lines near the flare stations at each of the sites. The GLA Team will collect condensate samples by carefully allowing the condensate to stream down the side of the sample container while ensuring that no condensate spills on the ground. Stringent health and safety protocols will be followed during condensate sampling to minimize dermal and inhalation exposure. As each sample bottle is filled, the labcock valve will be closed, the bottle capped, sealed, and labeled, and then placed in a chilled cooler for transport. The sampling process will follow the protocols described above until all bottles are filled. All condensate samples will be collected and transported in accordance with the same strict chain-of- custody protocols used for groundwater samples. Any condensate leak or spill resulting from sampling will be immediately reported to SWMD.

## *Soil-Pore Gas Sampling*

GLA's in-house sampling crew will collect soil-pore gas samples from designated monitoring probes throughout the three regions. For sites within the Santa Ana (except the Yucaipa Disposal Site and San Timoteo Sanitary Landfill) and Colorado River Basin regions, a RWQCB-approved field-screening protocol will be used to determine whether soil-pore gas samples should be collected for laboratory testing. For this monitoring, after purging at least one casing volume of air in the probes, a calibrated Landtec GEM 500 will be used to measure and record the concentrations of major gases (oxygen, nitrogen, carbon dioxide, and methane). If the methane concentration exceeds 5 percent by volume at a probe, a soil-pore gas sample will be collected from that probe using the procedures described below. If field screening results do not exceed these levels, no additional sampling or analyses will be completed at that monitoring point.

For monitoring points where discrete samples are required for laboratory analysis, new 10-liter Tedlar® bags will be used as sample containers. Just prior to sampling, the Tedlar® bags will be purged with nitrogen and evacuated three times, and then checked with an Organic Vapor Analyzer (OVA) to ensure that the bag contains no ambient organic contamination. Sample bags will then be checked for holding pressure, and any bag having leakage or contamination will be removed from service. To minimize the potential for contamination, the bag valve will be maintained in the closed

position until sampling begins. Samples will be collected by extracting soil-pore gas using a stainless-steel, gas-sampling pump with a non-lubricated Viton® diaphragm. Disposable, factory-cleaned Teflon® tubing will be used to connect the pump to the sample port located at the top of each monitoring probe. Prior to sampling, the sample pump, tube, and probe will be purged for approximately 30 to 50 seconds to flush out the probe and sample train. After the probe and train are flushed, the pump and tubing will be attached the Tedlar® sample bag. All gas samples will be pumped directly from the gas-monitoring probe into the Tedlar® bags using the sample train. A sufficient quantity of soil-pore gas will be collected in each bag to provide adequate sample for the laboratory to conduct the fixed gas and VOC analyses.

The GLA Team will take the necessary precautions not to overfill the Tedlar® bags, noting that changes in air pressure due to changes in elevation between the landfill and the laboratory may cause overfilled bags to burst during transport. GLA will typically collect two Tedlar® bags per sample to ensure an adequate volume when bags are not overfilled. After sampling, the probe and sampling train will again be purged for approximately 30 to 50 seconds to flush out the sampling equipment. After each sample has been collected, the Tedlar® bag will be checked to ensure that it is holding pressure, then be placed in a light-sealed box or bag during transport to minimize photochemical reactions. Prior to shipment to the laboratory, all samples will be properly cataloged and proper chain-of-custody documentation will accompany the samples to the laboratory.

## TASK 2. DATA ANALYSIS AND NOTIFICATIONS OF TENTATIVELY IDENTIFIED RELEASES

### *Data Validation Program*

Data evaluation represents an important aspect of the monitoring and reporting program considering that all of the analytical data must be validated. Following validation, the data will provide a basis for interpretation of site conditions at a level that satisfies all of the requirements of the individual site M&RPs.

The reporting team will be responsible for reviewing the logbooks submitted for QA/QC review at the end of each day/week to include completeness, documentation of equipment calibration and sample handling and chain-of-custody protocols, and consistency of field measurements with historical data. By this frequent review procedure, any deviations in procedures or protocols can be corrected immediately.

The laboratory data will undergo a detailed QA review to assess its precision and accuracy. At a minimum, the QA program should include the collection of liquid rinsate (equipment blanks) and trip blanks. GLA recommends adding field duplicates and field

blanks to the current program. Submittal of these samples to the analytical laboratory will occur without indication of their source (i.e. samples will be labeled to indicate a different location so as to prevent laboratory bias). In accordance with the laboratory QA/QC program, the laboratory will also prepare and document matrix spikes, matrix spike duplicates, surrogates and method blank results.

As data are received, rigorous data validation procedures will be employed by the Reporting Managers to assess the precision of the data (its reproducibility) by evaluating the relative percent difference (RPD) and relative standard deviation (RSD) of the sample and the duplicate results, should the County reintroduce field blanks into the QA/QC program. Accuracy will be evaluated from information obtained on the spiked samples by evaluating the percent recovery compared to the known spike amount. Surrogates (compounds that act and react similarly to the compounds of interest but which do not interfere with the constituent being analyzed) may also be spiked into the sample and used to evaluate the accuracy of certain organics methods.

In accordance with the Team's current QA/QC protocols, when laboratory analytical reports are received, they are reviewed by responsible staff for completeness and conformance with holding time requirements. In addition, for DMP protocols, the VOC and COC data from wells monitored under the non-statistical VOC/COC special analysis will be reviewed to evaluate whether there is evidence for tentative identification of a release from the landfill. If a VOC/COC special "hit" is identified, this information is then transmitted verbally to the SWMD Project Manager with a recommendation for retesting, if appropriate. [It should be noted that in some cases (e.g., detection of constituents such as methylene chloride and toluene, which are common laboratory or field-introduced contaminants), retesting may not be necessary. This conclusion will be reviewed with SWMD and, if appropriate, negotiated with the RWQCB.] Similarly, within 24 hours of receipt of the statistical analyses, the summary tables and supporting data will be reviewed for potential indications of release. If the data suggest evidence of release at any DMP well, this information will be reported to the SWMD Project Manager immediately so that appropriate responses (i.e., RWQCB notifications and retesting) can be implemented. At the direction of SWMD, the GLA Team can provide verbal notification to the appropriate RWQCB by phone within the required 24-hour time period. A follow-up letter or email to provide written documentation and notification of a tentatively identified release to the RWQCB will then be prepared and submitted to SWMD. This notice will include a summary of the laboratory findings, and a copy of the relevant laboratory analytical report(s). SWMD can then use the letter or email and laboratory analytical report(s) as a basis for providing the required written 7-day tentative release notification to the RWQCB.

## *Data/Database Management*

GLA has developed a web-based relational database to manage SWMD's historical monitoring data for all of its landfill and disposal sites. The database provides numerous advantages that translate into cost savings for SWMD. For example, analytical data are transmitted electronically to GLA's reporting team, who then uploads the data to the database, eliminating data input needs and associated potential for transcription errors. The database provides visual QA/QC tools that are used by the reporting manager to verify the accuracy of the data during the upload process. The reporting manager then generates historical tables and time-series charts directly from the database for use in monitoring reports. The database can also be used to generate files that can be uploaded into other software packages (such as for statistical analyses).

The secure browser-based web application interface provides a tool for which the user, including SWMD staff, can visualize real-time data using a GIS that permits viewing, interpreting, and understanding the County's data both spatially and temporally.

Maps of each of the County's landfills are readily viewable, including boundaries, aerial imagery, and sampling points. Users can query the database in two fundamental ways: The first is via a reports interface where the user selects a site, sampling point(s), and analyte(s). The results are shown on-screen in both tabular and graphical line-plot formats, and can be exported to a spreadsheet at the click of a button. The second is via a maps interface, where the user can navigate from site to site using map tools similar to those found in familiar web-based mapping services. Street maps and aerial imagery layers are both supported. The user can simply select a well from map-view to explore data associated with that sampling point. After specifying analyte(s) of interest and a date range, the user is presented with a pop-up window showing analyte concentrations in tabular format as well as time-series charts showing constituent concentrations in that well alongside the associated detection and quantification limits. Queries can also be performed for multiple wells using custom criteria, for example wells with analyte concentrations above a user-defined concentration and between a user-defined date range.

## *Statistical/Non-Statistical Analysis of Groundwater Quality Data*

GLA proposes to use accepted, commercially available computer software to perform the statistical analyses required in the various site-specific or blanket WDRs. Statistical methodologies will be consistent with the recommended EPA regulations and guidance as well as the ASTM D6312-98 Guidance and California-specific statistical procedures to ensure that a facility's groundwater quality statistical analysis procedures meet all relevant regulations.

Automated data processing allows simple selection of wells, analytical constituents, types of tests required at a particular facility (i.e. Prediction Limits, Control Charts,

Tolerance Limits) and rapid evaluation of the data, including allowance for such things as the percentage of non-detects, normality, and outliers. The ability of GLA to review and statistically analyze groundwater quality data within a few hours of its receipt ensures prompt identification and notification of statistical evidence of a release, and will allow retests to be collected, if necessary, in a time frame that can provide meaningful comparison with the primary sample results. While statistical analyses are most beneficial for identifying the first evidence of a release at sites in DMPs, GLA will continue to selectively employ statistics at sites in EMPs and CAPs as a tool to provide an unbiased assessment of changes in water quality.

The non-statistical VOC and COC Special Analysis, as outlined in SWRCB Resolution 93-62, will be performed for those analytes detected less than 10 percent of the time in samples from background wells. Since the background/upgradient wells at many of the landfill sites are not impacted by VOCs or other anthropogenic organic compounds, the VOC/COC Special Analysis is a useful deterministic tool to identify a potential release from the landfill.

## *Response Plan for Sampling/Laboratory Contamination*

While the GLA Team strives to collect samples that are representative of field conditions, "false positive" indications of release are an expected artifact of mandatory statistical evaluations. In addition, identification of anomalous constituents as a result of environmental conditions, sampling issues, or other field conditions can happen with any program of this size. When analytical results indicate that samples have been impacted, the results of the accompanying QA/QC samples will be evaluated to assess if the samples could have been contaminated during the sample collection or analytical processes. When field contamination is suspected, the sampling procedures will be reviewed with the sampling crew and/or analytical laboratory to minimize the potential for a repeat of the error. For example, if gasoline components are detected in the samples and the field blank, it is possible that the samples were collected downwind of a gasoline-powered engine, and correction may include verification that samples are collected upwind of a potential contaminant source.

In the case of suspected laboratory contamination, the GLA Team will review the data to identify possible contaminant sources, and will meet with the analytical laboratory to discuss the historical data and potential false positive results. The laboratory will be required to identify the cause of laboratory-related sample contamination, and will be required to implement a program to reduce the possibility of future contamination. In any event, if the "false positive" cannot be readily dismissed as a result of analytical or field QA/QC procedures, the GLA Team will perform a retest of that monitoring point as required. Since the state-mandated statistical protocols require a false positive rate of no less than one percent, the GLA Team has assumed that up to two discrete retests will be required each quarter.

## *Verification Sampling*

If statistical or non-statistical analyses of the analytical results indicate a new release from a facility monitored under a DMP may have occurred, recommendations for verification and immediate RWQCB notification will be submitted pursuant to 27 CCR § 20420(j)(1-3). For purposes of verification, two discrete retest samples will be collected from each monitoring point where contamination is suspected using the same sampling and analytical protocols employed in obtaining the primary sample. Retest samples will be analyzed only for those constituents that were identified at concentrations above background in the initial sample. If the compound is not detected in either of the retest samples, then a false positive detection will be concluded for the primary sample. If the compound is detected in one or both of the retest samples, then the primary detection will have been verified.

GLA notes that the Barstow Sanitary Landfill employs prediction limit statistical methods, and the retesting procedure for verification requires time-independent retesting. As a result, one retest will be collected immediately after a release is indicated and the second retest sample will be collected approximately one month after the first retest sample is collected.

Should retesting verify the original result, a single sample from each DMP monitoring point at that site will then be analyzed for the full list of Constituents of Concern (COCs). While up to two retests are anticipated per calendar quarter and this cost is included in the enclosed fee estimate, the need for and extent of release-induced COC monitoring cannot be reasonably estimated and this work will be completed as an unforeseen expenditure and handled under the discretion of the County project manager.

## *Trend Analyses*

Analysis of groundwater and surface water quality and soil-pore gas data trends is an annual reporting requirement for all sites within the three RWQCB regions. In addition, trend analyses are performed in lieu of traditional statistical analyses during each monitoring period at the Apple Valley, Lenwood-Hinkley, Victorville, and Yermo Sanitary Landfills in the Lahontan Region. Time-series charts will be prepared using the graphing function in the GLA-prepared database so that any identified changes can be compared to the library of more than three decades of historical data, which will help evaluate whether the changes can be related to cyclical changes that accompany relatively wet and dry periods.

GLA proposes the following strategy to prepare time-series plots. For general minerals and metals, GLA will prepare time-series plots comparing background and compliance well data (interwell charts). In general, no more than five data sets will be presented on one chart to maximize presentation clarity. The historical sample data from each well will be plotted with a unique symbol marking and color. On these charts, the historical data

will also be compared with Federal maximum contaminant levels (MCLs). Concentrations that are below the method detection limit (MDL) will be plotted with open symbols at one-half of the MDL reported specifically during each monitoring period. Data that are not available will be shown by a break in the trend line.

With respect to VOCs, charts will be prepared for each VOC that has been regularly detected at least 10 percent of the time in samples from at least one monitoring well at a given site. Historical VOC data in samples from each impacted well will be plotted and compared against the MDL and the Federal MCL, if appropriate. If a VOC was not detected during a particular monitoring period, the concentration will be plotted at one-half the MDL reported for that constituent during that monitoring period.

The annual reports for sites where soil-pore gas is monitored will also contain charts for methane and the cumulative concentrations of related soil-pore gas constituents. Since samples of soil-pore gas may contain 20 or more different VOCs, charting individual VOC trends can be uninformative. Given the fact that individual VOC concentrations in soil-pore gas are extremely variable and do not individually lead to defensible conclusions regarding landfill releases or potential releases, GLA has found it more useful to chart the combined concentrations of related VOCs to summarize soil-pore gas data trends (e.g., Total Petroleum Hydrocarbons for the sum of the concentrations of benzene, ethyl benzene, toluene and total xylenes). Using this approach, up to seven charts may be developed for each site (depending on the occurrence of VOCs in individual samples). As with the groundwater charts, soil-pore gas charts will contain no more than five data sets to ensure clarity of presentation.

Data trends will be summarized in tables within the quarterly, semi-annual, and annual reports, as required by the site-specific WDRs. In analyzing time-series charts, it is important not to describe a trend simply according to the slope of a mathematically calculated data trendline. Rather, it is important to review historical seasonal fluctuations in data, changes in MDLs, and concentration changes that may be the result of a change in laboratory analytical methods or field sampling protocols. As a result, our approach to trend analysis is somewhat qualitative, and it provides a better opportunity to evaluate changes in groundwater by accounting for factors that are not typically accounted for in pure mathematical approaches. Significant increasing or decreasing trends will be described in detail following the summary table, with the level of discussion enhanced when changes in historical trends appear to be developing.

## *Concentration Limit Evaluation*

Concentration limits are required to be calculated for landfills and disposal sites in the Lahontan Region in accordance with RWQCB Blanket Order 6-93-100 and the subsequent site-specific WDRs. The Blanket Order and 27 CCR §20400 allow concentration limits to be established using either historical background concentrations

(a one-time determination), concurrent background concentrations from one or more monitoring wells (either recalculated or redetermined during each monitoring event or at regular intervals), or a concentration limit that is greater than a background concentration as a corrective action clean-up goal. Based on our detailed understanding of the groundwater quality of landfills and disposal sites in the Lahontan Region, GLA proposes to recalculate the background concentration limits on an annual basis to reflect naturally occurring changes in background groundwater quality.

Depending on the site geological conditions, concentration limits will be calculated using either historical intrawell data to obtain the upper 95 percent prediction limit for each well and analyte or the historical background data to calculate the upper 95 percent tolerance limits for background well chemistries. If the tolerance limit approach is used, the historical background data from samples collected at one or more background wells will be pooled into a single database, the data will be normalized, and the tolerance limits for each regularly detected analyte will be calculated using methods and procedures outlined in the U.S. EPA's Unified Guidance Document.

For sites where significant natural spatial variability has been documented (i.e., Trona-Argus Sanitary Landfill), an intrawell Prediction Limit approach will be employed by compiling the data for each well, normalizing the data, and then applying the appropriate Student's T-test value identified in the U.S. EPA's Unified Guidance Document for this statistical method.

Statistically calculated Prediction Limits and Tolerance Limits will be calculated for all normally-distributed (or normally transformed data). For non-normally distributed analytes (i.e., those that are rarely detected in the historical or spatial background or that exhibit significant temporal variations precluding normal transformations), the highest measured value will be used as the Concentration Limit. For VOCs that are known to be absent upgradient of a landfill, GLA proposes to use the current laboratory method detection limits for each organic compound as its concentration limit.

GLA proposes to prepare an annual cover letter with text that justifies the methods used to calculate the concentration limits at SWMD landfill sites. The letter report will include a summary table of the proposed concentration limits, historical monitoring results, and charts depicting the concentration limit calculation. The letter report will accompany the annual groundwater monitoring report.

## *Constituents of Concern (COC) Evaluation*

The COC analytes include an extended list of VOCs, SVOCs, polychlorinated biphenyls, pesticides, herbicides, 17 metals, sulfide, and cyanide as defined in 40 CFR Part 258 and additional analytes identified in site-specific M&RPs. Emerging contaminants my be added to a site's COC list during this contract. COC testing is required at least once every five years, and the next round of COC testing at SWMD's landfills is scheduled for

most of the County's landfills during the first half of 2025 (June 2027 for the Parker Dam Disposal Site if the RWQCB does not allow for cessation of monitoring). In addition to the prescribed frequency at existing wells, new groundwater monitoring wells will be analyzed for all COCs. While new downgradient wells will only be tested for one round of COCs, new background wells will require four quarters of COC testing. Since none of the organic compounds on the COC list occurs naturally in groundwater, their presence alone would indicate an anthropogenic source that might include the landfill. Most of these organic compounds are mobile in groundwater and as a result, GLA would anticipate adding any organic constituents that are detected during the COC analysis to the list of routine monitoring parameters. The following procedures will be followed before recommending any addition to the routine list of monitoring parameters:

- If a new organic compound is detected in a sample, two retest samples will be collected and analyzed to verify its presence.
- If the organic compound is not detected in both of the retest samples, then a false positive detection will be concluded for the primary sample, and the organic compound will not be added to the list of routine monitoring parameters.
- If the organic compound is detected in one or both of the retest samples, then the primary detection is confirmed, and GLA would recommend adding the compound to the routine list of monitoring parameters.

### *Prepare Water Quality Protection Standards*

Section 20390 of 27 CCR requires development of a water quality protection standard (WQPS) for each landfill that includes a list of the constituents of concern, the concentration limits, the point of compliance, and all monitoring points at the site. The WQPS applies during the active life of a landfill, the closure period, the post-closure maintenance period, and during any compliance period.

WQPSs have already been established for most of the landfills in this program. However, if additional background wells are installed at any of the sites, data from the new background wells will be combined with other background well data to calculate a revised WQPS.

## TASK 3. REPORTING

One routine monitoring report will be prepared for each landfill shortly after monitoring and analyses have been completed for that landfill. Each quarterly, semi-annual, or annual report will contain the information required by the individual site WDRs and will, at a minimum, include:

- Executive summary

- Table of contents
- Site introduction
- Sampling and analysis plan
- Laboratory analyses and QA/QC results
- Descriptions of sampling and analytical procedures and parameters
- Discussion of statistical and/or non-statistical data evaluation
- Historical groundwater elevation data
- A groundwater equipotential surface map
- Historical tables of laboratory test results for each well
- Summary tables of analytical results for the reporting period(s)
- A discussion of the results of the water quality monitoring, soil-pore gas monitoring, and statistical analyses

As required, monitoring reports will also integrate data collected by the GLA Team's sampling crew including visual observations and photographs of site conditions, copies of the regulatory agency inspections, and copies of the surface drainage control facilities inspection and evaluation logs. Discussions will be more detailed when chemical and/or elevation variations are noted from earlier reporting periods, and recommendations for verification and/or initiation of an EMP will be presented if release is indicated. Final reports will be reviewed and signed/stamped by a State of California licensed geologist or hydrogeologist.

In addition to the information listed above, monitoring reports for the Mid-Valley Landfill will include details associated with the CAP groundwater treatment system and an evaluation of its effectiveness. Similarly, the monitoring report for the Milliken Sanitary Landfill will include a summary of the groundwater treatment system, which includes field inspection and depth to water measurements of the upper aquifer. GLA will provide peer review of the field reports provided by SWMD collected during the site's OM&M and include discussions of any significant observations in the routine monitoring report. Monitoring reports for the Yucaipa Disposal Site and the Lenwood-Hinkley Sanitary Landfill will include a summary of any bioremediation activities conducted on-site and the effectiveness of these programs.

In lieu of the fourth quarterly or second semi-annual reports, an annual report will be prepared for each site [due January 30 for all Lahontan Region landfills except Apple Valley and Trona Argus (February 15), February 15 for the Colorado River Basin Region landfills except Morongo (April 30), and April 30 for the Santa Ana Region landfills except Crestmore (November 30)]. In addition to the elements required in a routine quarterly or semi-annual reporting event, these annual reports will also include an

evaluation of trends interpreted from the time-series plots for at least the previous five calendar years; descriptions of any apparent increasing and/or decreasing trends, and reporting of any monitoring changes made or observed since the last annual report.

## *Submittal Procedure*

Prior to submittal of any work product to SWMD, GLA will conduct comprehensive senior peer review of all deliverable technical documents. In addition, SWMD will approve all project work scopes and will also review all deliverables in draft form so that the final submittals are responsive to SWMD's needs. One draft copy of each report will be submitted to SWMD at least three weeks prior to the RWQCB submittal dates outlined in the individual site WDRs. Following incorporation of SWMD comments, GLA will distribute the reports on behalf of SWMD to the respective RWQCBs (PDF copy of the report, EDD, and Geo-Well files uploaded to GeoTracker), Local Enforcement Agency (CD or flash drive containing PDF copies of the reports for each of the three RWQCB regions), SWMD (one bound copy and a CD or flash drive containing a PDF copy of the report, Word file of the text, and an Excel file of the tables), and other agencies/parties, as directed by SWMD.

The Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of 27 CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site. Beginning January 1, 2005, the SWRCB enforced this regulation for landfills by requiring electronic submittal of all environmental monitoring data for landfill sites to the SWRCB's GeoTracker website. The RWQCBs have since become "paperless", and the electronic submittal to the RWQCB serves as the official submittal. Information required in the GeoTracker submittal includes:

GEO_WELL. This file contains a listing of all site monitoring points, as well as potential blank sample identifications. The GEO_WELL file contains well construction information and initial depth to water measurements. The GEO_WELL file is updated after every monitoring period to include the latest groundwater equipotential data.

GEO_MAP. This file is a map showing site monitoring point locations, landfill boundaries, and property boundaries. Other information such as geologic contacts can also be presented on this map. This file is uploaded once, and would only be uploaded again if the groundwater monitoring system changes.

GEO_XY. This file contains the surveyed latitude and longitude for each monitoring point. This file is uploaded once, and updates occur when monitoring wells are added or decommissioned.

GEO_Z. This file contains the surveyed reference elevations for each monitoring point. The GEO_ XY and GEO_Z files are uploaded once, and would only be

uploaded again if the site is re-surveyed or if the groundwater monitoring system were to change.

EDF. This is the Electronic Data Format file that the laboratory prepares once the laboratory report is approved by the groundwater consultant. The EDF file contains information regarding groundwater sampling personnel, sample dates, sample times, holding times, analytical data, and quality assurance/quality control results. As part of the upload process, the EDF is screened by the GeoTracker program for completeness and accuracy.

Groundwater Monitoring Report. RWQCBs across the state have instituted paperless report submittals and require that the owner/operator of a landfill complete GeoTracker uploads of the final groundwater monitoring reports prior to the reporting compliance dates established in the M&RP. Groundwater monitoring reports are prepared in PDF format in one or more parts that do not exceed 400MB and uploaded into the GeoTracker system by the report submittal deadline.

Because the Geotracker website provides landfill data to the public, all data and reports submitted to the site must be reviewed and approved by the RWQCB before they are made available for viewing. As a result, although the County's consultant may submit the landfill groundwater monitoring reports, data files, and EDF data to the Geotracker website on or before the regulatory compliance deadline, these files may not be available for viewing on Geotracker for 30 days after the upload date due to the agency review and approval process.

## TASK 4. LABORATORY ANALYSIS

As described above, GLA's selected laboratory (Pace Analytical [Pace]), a California-certified laboratory located in Bakersfield, California) will provide new sample containers and coolers approximately one to two weeks prior to the scheduled sampling event. GLA's sampling crew will inventory the materials to verify that all supplies have been received prior to mobilization. Following sampling activities, GLA will coordinate with Pace to provide a courier service to assure that the samples are delivered to the laboratory within 24 hours of sample collection.

All analytical tests will be completed within the EPA's recommended maximum holding time and meet the QA/QC requirements specified in the EPA's Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium (also known as SW-846), EPA's official collection of methods for use in complying with the Resource Conservation and Recovery Act (RCRA) regulations. When analytical testing has been completed and the sample delivery group meets the laboratory's internal QA/QC

protocols, the laboratory will supply an electronic copy of the laboratory report (in PDF format) and a digital file (electronic data deliverable [EDD] file) suitable for uploading to the State's GeoTracker database. GLA will complete the data validation procedures described in Task 2 prior to uploading the EDD file to Geotracker.

In addition, GLA will review the analytical requirements along with the sampling requirements for each site in June of each year. GLA may recommend updates to the Sampling and Analysis Plan if more suitable analytical testing methods are available. However, no changes will be made without SWMD's authorization.

## TASK 5. PROJECT ADMINISTRATION

The primary objective of the GLA Team is to complete the specified work on time and within budget to the highest quality professional standards. To achieve this objective, GLA will maintain regular communication with SWMD's Project Manager through personal interaction, telephone and e-mail communication, formal written monthly progress reports, and meetings. Project status presentations to inform and update technical and/or regulatory staff will also be completed at the request of SWMD.

### *Project Scheduling, Tracking and Budgeting*

GLA utilizes state of the art project management tools for both technical and financial project management. Ms. Thibeault will use the company's financial and project management software to track project expenditures and project scheduling software to create and track the schedule. She will monitor the progress of work, by regular communication with project staff and interim review of work, to ensure that the progress made reflects the amount spent. The project schedule will be managed by creating a baseline Gantt chart schedule and reviewing progress against the schedule on a regular interval, at least weekly. Ultimately, the Project Manager's attention and understanding of the client's expectations is the most fundamental control, in conjunction with regular monitoring of work product, project expenditures and meeting project milestones.

### *Invoices*

GLA will submit monthly invoices by the 15th day of each month throughout the extent of the contract, which will include:

1. County contract number and period of service.

2. Fixed-Fee Summary: Items on the fixed-fee section of the invoice will include routine water quality sampling, data analysis, reporting, and administrative functions for all landfills and disposal sites on a per landfill basis. Each invoice will represent a fixed-fee amount of 1/12th of the contract amount for the fiscal year (ending June 30th). Each

invoice will detail the amount previously invoiced, the amount invoiced to date, the amount invoiced in the current period, the percent complete, and the remaining funds available.

3. Time and Materials (T&M) Summary: Charges on the T&M portion of the invoice will include line items for laboratory analyses for all samples (groundwater, surface water, soil-pore gas, leachate, and condensate) on a per-landfill basis. Each invoice will detail the amount previously invoiced for each landfill, the amount invoiced to date, the amount invoiced in the current period, percent complete for analytical costs at each landfill, percent of budget consumed to date for analytical costs, and remaining funds available for analytical costs.

GLA's Project Manager will review draft and final invoices prior to submittal to the County to verify accuracy and completeness.

## *Meetings*

Upon receiving a notice-to-proceed, the GLA Team will immediately convene with the GLA Project Manager and Task Managers to initiate the work effort. A draft schedule (Microsoft™ Project® format or equivalent) will be prepared along with the updated project work plan, health and safety plan, and sample bottle order forms.

An initial project meeting will also be held with the designated SWMD Project Manager and staff, the contract analytical laboratory, and appropriate project Team members. In addition to the disposition of any final contract issues, the meeting agenda will address the following items:

- Roles and Responsibilities
- Technical Issues
- Lines of Communication
- Overall Project Schedule
- Framework of Work Plan
- Involvement of RWQCBs

In addition to the project start-up meeting, GLA recommends that additional quarterly meetings be convened with SWMD staff prior to initiating subsequent monitoring events. These incremental meetings will, at a minimum, address the following issues:

- Lessons Learned from Previous Monitoring Period
- Other Technical Issues
- System Modifications in Response to Lessons Learned
- Current Period Monitoring Schedule
- Laboratory QA/QC

- Involvement of RWQCBs
- Budget and expenditure updates.