####-select-and-replace-with-agency-name-and-order-number

**GEOTRACKER SUPRA ORDER (GTSO) AUGMENTING THE MONITORING AND REPORTING PROGRAM FOR THE** ####-select-and-replace-with-landfill’s-GeoTracker-format name-and-its classification **LANDFILL**

**GTSO TYPE: NO-LCRS**

**A. GENERAL**

1. **Purpose —** This GeoTracker Supra Order (GTSO) imposes changes to the subject MSW landfill’s existing “Monitoring and Reporting Program (M&RP),” meaning those aspects of the permit that address monitoring. This is a “Supra Order” because it is a stand-alone body of monitoring-related requirements that is not integrated into the M&RP, per se, but that imposes requirements that, following completion of the “Phase-In” work detailed under Section B of the order, replace any M&RP requirement that it duplicates or with which it conflicts. As such, the GTSO serves to update the landfill’s M&RP until such time as the agency revises the M&RP to include the GTSO’s modernized approaches into the M&RP per se and to rescind the M&RP’s obsolete requirements.

2. **Phase-In Period —** The Owner/Operator’s initial actions, after receiving notice that this GTSO applies to their landfill, shall be to continue implementing the landfill’s existing M&RP exactly the same as was the case prior to the GTSO. As a separate concurrent endeavor, the Owner/Operator shall comply with this portion of the GTSO (Section A) and shall implement the GTSO’s “Phase-In Period” (Section B) requirements. Therefore, during this Phase-In Period, the only portions of the GTSO that are applicable are its Sections A and B.

3. **After Phase-In —** Once the agency notifies the Owner/Operator that the landfill’s GTSO Phase-In Period work is complete, GTSO Section B ceases to apply. Thereafter, any requirement in the M&RP that conflicts with, or duplicates, a then-applicable GTSO requirement is superseded thereby.

Once the GTSO Phase-In Period is completed, the requirements of GTSO Sections A and C apply to the landfill at all times. In addition**:**

a. **No Release —** GTSO Section D applies any time the landfill is in a Detection Monitoring Program (DMP) and all FldPt/MonPar pairs for the landfill are in Standard Status. Therefore, once a release is identified (in a DMP) and the initial response actions listed in GTSO ¶D.1 have been completed, Section D ceases to apply until such time as the landfill returns to a DMP following the successful completion of an Assessment Monitoring Program (AMP), pursuant to GTSO ¶E.3;

b. **Release —** GTSO Section E applies any time there is a known release that is identified after the landfill has started an AMP; and

c. **CAP for the Release —** GTSO Section  F applies any time the landfill is implementing a Corrective Action Program (CAP) concurrently with an AMP after the agency has revised the this GTSO, to include all additional CAP components and CAP preparation actions required by Federal Rule §258.55(g), §258.56, §258.57, and §258.58.

Thus, prior to beginning an AMP, or after returning to a DMP from an AMP, only GTSO Sections A, C, and D apply; upon beginning an AMP, only GTSO Sections A, C, and E apply; whereas, whenever the landfill is implementing a CAP, only GTSO Sections A, C, E, and F apply.

4. **Begin and Continue GeoTracker Participation—** The Owner/Operator implementing this GTSO shall create and maintain for their facility, at all times, an account under the ####-select-and-replace-with-the-long-name-of-the-state’s-Module(GeoTracker Module), beginning immediately, as described in the Quick Start Manual, which the Owner/Operator shall download from ####-select-&-replace-with-the-URL-for-the-state-GeoTracker-Help-Desk.

The Owner/Operator shall keep all entries in the facility’s GeoTracker Module account up-to-date, and shall continue to create and upload all submittals described under the “Fix-It Manual,” which the Owner/Operator shall download from <http://www.sanitastech.com/Fix-It/> **$$$$-I-insert-URL-once-Kristina-gives-it-to-me**. For any Field Point named in this order, the Owner/Operator shall assign an identical name to that Field Point in the facility’s GeoTracker Module account.

The actions necessary to keep the facility’s GeoTracker Module account current include the following**:**

a. **Lab Data —** Beginning immediately upon establishing the facility’s GeoTracker account, the Owner/Operator shall upload **all** facility-related laboratory analytical data produced each successive Reporting Period (see GTSO ¶C.1) thereafter to that account in EDF format [see EDF information under the “Technical Information on Uploading Data” document downloadable from the above-named GeoTracker Help Desk website]. The scope of this upload to the facility’s GeoTracker Module account shall include all analytes determined for each sample at the facility since the prior Reporting Period’s laboratory data upload, whether or not the analyte is a Constituent of Concern (COC) for any waste management unit at the facility;

b. **Compliance Spreadsheet —** Beginning with the first Reporting Period after completing the GTSO Phase-In (see GTSO Section B), and continuing with each successive Reporting Period thereafter, the Owner/Operator shall upload to the facility’s GeoTracker Module account a copy of the facility’s Compliance Spreadsheet (see the Quick Start Manual), updated to reflect all changes that have occurred within that Reporting Period to any COC at any compliance-testing Field Point (FldPt);

c. **Monitoring Reports —** Beginning after completing the GTSO Phase-In, the Owner/Operator shall submit, following each Reporting Period, a Monitoring Report by uploading it to the facility’s GeoTracker Module account in word-searchable PDF format. Each such Monitoring Report shall include**:**

(i) **Spreadsheet —** A copy of the finalized Compliance Spreadsheet for that Reporting Period, with the column headers repeating on each successive page thereof; and

(ii) **Map —** A map (or, if need be, a standardized series of maps), drawn at a suitable scale, that is current as of the date of submittal, and that shows the following, in addition to a scale, key, and north arrow**:** **1)** the facility’s perimeter and gate(s); **2)** roads internal and immediately-external to the facility**;** **3)** the direction(s) of groundwater flow during that Reporting Period**;** **4)** the topography of the landfill, of the overall facility, and of its immediate environs, via contour lines set at a contour interval appropriate to express relevant variations in relief**;** **5)** the location and unique-within-that-facility GeoTracker name of each FldPt and background FldPt for groundwater**;** **6)** the location and GeoTracker name of each other Field Point (e.g., for LGGsampling)**;** **7)** the location, outline, and unique-within-that-facility GeoTracker name of each regulated waste management unit at the facility**;** and **8)** if the landfill has a release, the map shall use special icon shapes (or other attributes) identified in the map key that differentiate FldPts impacted by the release (i.e., having one or more MonPars no longer in Standard Status) from those FldPts that, as yet, show no release effect;

d. **Annual Summary Monitoring Report —** Beginning after completing the GTSO Phase-In Period, the Owner/Operator shall include, as a part of the Monitoring Report for the Second Reporting Period of each Monitoring Year (see GTSO ¶C.1), an Annual Summary Monitoring Report that identifies, briefly, each noteworthy monitoring result that occurred during that Monitoring Year, and that contains each of the following tabulations, updated to be current as of the date of uploading of that report**:**

(i) **Post-Phase-In Background Data Set Table —** A table showing the background data set for each FldPt/COC pair. For a FldPt/COC pair testing relative to a background data set, the table names the background data source type (Interwell or Intrawell), lists the dated data points making up that pair’s reference background data set and, for an interwell background data set, provides the GeoTracker name for the background FldPt from which this data was obtained. For a FldPt/MonPar pair having an MCL- or ACL Concentration Limit, its listing in this table shall name the type (MCL or ACL) and concentration value of its Concentration Limit, and shall list the data source and the dated data points for that pair’s alternative reference background data set, together with the GeoTracker name for the well from which that data was obtained.

For any background datum (or alternative background datum) listed in the table, the information for each left-censored background data point (i.e., an “ND” datum or estimated “trace” value) shall include the MDL and PQL values that were in effect when that sample was analyzed, and each “trace” determination shall include a qualified concentration estimate.

In a case where, as of a given date within that Monitoring Year, a given FldPt/COC pair’s reference background data have had any of its earliest data points rescinded or had any new background data points added, the table’s listing for that pair shall identify these rescinded-or-added data points and provide an effective date for that change. In subsequent years, the table’s record for that FldPt/COC pair can list only the updated background data set, without noting the prior rescission or addition;

(ii) **Post-Phase-In Data Analysis Method Table —** A clear description of each data analysis method used, together with (for each such method) a list of the FldPt/COC pairs to which that method was applied. This listing shall reflect the data analysis methods used, and the FldPt/COC pairs to which they were applicable, as of the Second Reporting Period of that Monitoring Year.

GTSO-prescribed nonstatistical data analysis methods need only be named but, for any statistical method, include the value used for each parameter. For statistical methods, the method description shall have enough detail to enable one to apply that method to the background data set declared for an applicable FldPt/MonPar pair and obtain reliably, thereby, the same CONCLIM value as declared in the record (line of data) for that pair in the facility’s Compliance Spreadsheet for the Second Reporting Period of that Monitoring Year; and

(iii) **Post-Phase-In Retesting Table —** A table declaring the Reporting Period, the constituent and Field Point, the applicable CONCLIM value, the sample data analyzed, and a brief test conclusion synopsis, for each instance during that Monitoring Year where retesting was required. For each waste management unit (Unit), the listing shall break the retesting down into the following four types, each grouped separately for that Unit, if that type of testing was done that year and resulted in a retest**:** **1)** retested prospective new Appendix II COCs, as a result of annual non-COC testing; **2)**  retested FldPt/UnPar pairs, if any UnPar testing was done that Monitoring Year; **3)**  retested Standard Status FldPt/MonPar pairs; and **4)**  retested Tracking Status FldPt/MonPar pairs; and

e. **Updating Declared Facility Components —** The Owner/Operator shall update the facility’s GeoTracker Module account promptly as needed to address such changes as the addition of a new Field Point, compliance-testing Field Point, or background Field Point, or the addition of a new landfill lateral and/or vertical expansion. If a landfill lateral expansion results in the need to change the type of GTSO that the landfill uses, the Owner/Operator shall so notify the regulatory agency and shall provide all necessary information needed to complete the new GTSO (e.g., the GeoTracker name of the leachate-sampling Field Point for the lined expansion area), in which case the revised GTSO replaces the prior GTSO upon issuance.

5. **Reference the Fix-It Manual —** In case there is a question regarding any GTSO requirement, the Owner/Operator shall first consult the Fix-It Manual. For any issue outside the scope of that document, or that is not resolved by it, address the issue to the agency staff contact, for non-GeoTracker issues, or to the state GeoTracker Help desk noted in the lead paragraph of ¶A.4. of this GTSO.

6. **Try It First —** The GTSO is an integrated package designed to provide a synergistic effect by the way its several component parts interact, resulting in a more effective (including cost-effective) monitoring approach. As such, the Owner/Operator is welcome to propose and substantiate the modification of a requirement in the GTSO only after having complied with the GTSO for a period of at least three Monitoring Years following completion of the landfill’s GTSO Phase-In Period.

By contrast, this paragraph does not apply to any error in the GTSO or any error or point of confusion in, or caused by, the Fix-It Manual. All such issues should be reported immediately, with any resulting adjustment becoming effective upon approval by the regulatory agency.

7. **Change Proposals —** For any timely GTSO change proposal submitted pursuant to GTSO ¶A.6, the Owner/Operator shall delineate the purpose that the targeted GTSO requirement is intended to achieve, as described in the Fix-It Manual, and shall show how the proposed alternative approach will achieve that goal at least as well as does the GTSO requirement it is to replace. This proposal shall be included in the Monitoring Report for that Reporting Period. Any such proposed change is effective upon approval-or-adoptions, which shall be noted in the Monitoring Report for the Reporting Period in which it is occurs.

8. **GTSO Type & Non-COC Field Points —** This is the “No-LCRS” version of the GTSO that is applicable only to an MSW landfill that does not have a leachate collection and removal system (LCRS) that captures leachate originating from any-and-all portions of the landfill’s waste mass. The “Non-COC” Field Points listed below shall are used, during the initial part of the Phase-In Period (under GTSO Section B), to identify that subset of the constituents listed in Appendix II of the Federal Rule (Appendix II) that must be included among the landfill’s post-Phase-In Constituents of Concern (COCs) because they could be mobilized in a release from the landfill.

In addition, following the Phase-In Period, the Owner/Operator shall test the non-COC-testing Field Points listed below annually at the start of each Monitoring Year’s Second Reporting Period, under GTSO ¶C.1, to identify each additional Appendix II constituent that should become a new COC for the landfill [see GTSO ¶C.4].

The non-COC-testing Field Points are as follows**:**

\* the ####-select-and-replace-with-the-GeoTracker-name-for-the-selected-groundwater-Field-Point-to-use-for-non-COC-sampling groundwater FldPt shall be tested at the start of the Phase-In period for all Appendix II constituents other than VOCs and SVOCs, and, following completion of the Phase-In period, shall be tested annually for all non-COC Appendix II constituents other than VOCs and SVOCs; and

\* the ####-select-and-replace-with-the-GeoTracker-name-for-the-chosen-LFG-or-LFG-condensate-Field-Point ####-select-and-replace-with-either-“landfill-gas-(LFG)”-or-“LFG-condensate,”-as-appropriate Field Point shall be tested at the start of the Phase-In period for all Appendix II VOCs and SVOCs and, following completion of the Phase-In period, shall be tested annually for all non-COC Appendix II VOCs and SVOCs.

9. **Use GeoTracker Names —** Any time a submittal by the Owner/Operator makes reference to one of the facility Waste Management Units, compliance-testing Field Points (FldPts), background Field Points, or other Field Points, the name shall be identical to the name the Owner/Operator has established for it in the GeoTracker Module account for the facility.

Likewise, in order to avoid confusion and technical difficulties, each time the Owner/Operator refers to a chemical constituent in any submittal or upload, the constituent shorthand name shall be identical to the “valid-value” for that constituent under the GeoTracker PARLABEL listing (see See Appendix 5 of the Fix-It Manual), and its full name shall be the one identified as its “Description” under that listing. The Owner/Operator can use either the short or the long name, for that constituent, but no other name.

10. **Field Points —** A given “Field Point” (the generic GeoTracker name for a sampling location) ceases to function in that capacity only after the agency has declared that fact in writing and the Owner/Operator has noted that change in the Monitoring Report for the Reporting Period in which the Owner/Operator received that directive. Sampling locations that the Owner/Operator installs to help delineate the nature and extent of a release are Field Points subject to being named and located as part of the facility’s GeoTracker account; however, no such Field Point becomes a compliance-testing Field Point (FldPt) that is subject to being listed under the facility’s Compliance Spreadsheet unless-or-until the agency so specifies.

**B. GTSO PHASE-IN PERIOD**

1. **First Step: Establish the Limited Suite of Post-Phase-In COCs for the Landfill —** Concurrently with the Owner/Operator’s establishment of the facility GeoTracker Module account, the Owner/Operator shall sample and analyze each Non-COC Field Point named in GTSO ¶A.8 for its respective portion of the Appendix II constituents and for all currently-assigned nonhazardous constituents within ten days after the GTSO begins applying to the landfill. For any Appendix II constituent that exceeds its respective PQL in the initial sample, the Owner/Operator shall obtain a single retest sample at that Non-COC Field Point three months thereafter and shall identify all Appendix II constituents that exceeded their respective PQL in both the initial sample and the retest samples (a pass-1-of-2 retesting approach).

The results of both sampling efforts, at that Non-COC Field Point, are included in the facility’s laboratory data upload to the facility GeoTracker account for that Reporting Period and are described in the Monitoring Report for that Reporting Period. At any non-COC Field Point for which the Owner/Operator has carried out all-Appendix-II testing previously, the Owner/Operator can substitute the last two such sampling results for the initial and retest samples, respectively, but only if the laboratory results of those prior samples are uploaded to the facility’s GeoTracker account and the analysis for each such constituent is relative to its PQL, rather than being relative to a Reporting Limit (RL) value above its PQL.

The proposed post-Phase-In COCs for the landfill shall include the following four groups**: 1)**each Appendix II constituent that exceeded its respective PQL in both the initial and retest sample at any assigned Non-COC Field Point**;** **2)**each known breakdown product of an included volatile organic constituent (VOC) that is, itself, a VOC**;** **3)**all known release constituents for any release for which the remediation is not yet complete — unlike the other MonPars, which begin Post-Phase-In monitoring in Standard Status, these MonPars will all begin functioning in Tracking Status at those FldPts where that COC has exhibited a known release effect**;** and **4)**one or two conservative “metals surrogate” nonhazardous constituents that exhibit a considerably higher concentration in the landfill than they do in groundwater.

Upon completing this Post-Phase-In COC workup, the Owner/Operator shall include it as a proposal in the Monitoring Report for that Reporting Period that includes**:**

a. **Categorized Post-Transition COCs —** A list of the prospective post-Phase-In COCs for the landfill, broken into the four above-listed categories including, in the fourth such group, no more than two nonhazardous constituents that will provide the best service as Monitoring Parameters serving as surrogates for the Appendix I metals. Until it is approved, this list is prospective, but the Owner/Operator shall proceed, nevertheless, with the actions required under GTSO ¶¶B.2 and B.3 for each constituent on this prospective post-Phase-In COC list at each of the FldPts and background FldPts for the landfill; and

b. **Rejected COCs —** A list of all Appendix II constituents that are not included among the Post-Phase-In COCs for that landfill.

2. **Second Step: Conduct Initial Concentration Limit Studies —** Upon establishing the prospective post-Phase-In COCs for the landfill, pursuant to GTSO ¶B.1, the Owner/Operator shall conduct a Concentration Limit Study (Study) for each post-Phase-In COC at each compliance-testing Field Point (i.e., for each “FldPt/COC pair”), as described in Fix-It Manual Subchapter 2.2.

All of the Studies for a given COC are integrated into a combined Study that is included in the Monitoring Report for the Reporting Period when the last Study for that COC is completed. For each group of Studies (for a given post-Phase-In COC) that is approved, approved with changes, or rejected, that response is noted in the Monitoring Report for the Reporting Period when the response was received. During the GTSO Phase-In Period, all approved initial Studies remain in abeyance until the Study for each Post-Phase-In COC at each FldPt has received agency approval.

As discussed in Fix-It Manual Subchapter 2.2, the groundwater MonPars proposed as part of the initial group of Studies shall include**: a)**all Post-Phase-In COCs that are VOCs; **b)** one or two ideally-suited inorganic constituents identified in the Studies, to act as metals surrogates; **c)** any COCs that were known to be part of a release as of the date of adoption of this GTSO; and **d)** at any given time after completing the Phase-In Period, all UnPar COCs that have converted to being groundwater MonPar COCs.

3. **Completing the Phase-In Period —** Upon the Owner/Operator’s receiving notice from the agency that the prospective post-Phase-In COC list (under GTSO ¶ B.1.a) together with all Concentration Limit Studies submitted under GTSO ¶B.2 (for the Post-Phase-In FldPt/COC pairs) are approved, then the following occurs as of the beginning of the next GTSO Reporting Period [see ¶C.1] following the receipt of such notice**:** **1)**  the Owner/Operator continues complying with GTSO Section A, and begins complying with GTSO Section C together with GTSO Section D (if in a DMP), or Sections D and E (if in an AMP), or Sections D, E, and F (if in a concurrent AMP and CAP), as explained under GTSO ¶A.3**;**  **2)**  the Owner/Operator includes a note (in the Monitoring Report for the first post-Phase-In Reporting Period) heralding this acceptance determination by the agency and the resulting end of the landfill’s GTSO Phase-In Period; and **3)** this GTSO Section B ceases to apply permanently.

**C. GENERAL GTSO REQUIREMENTS FOR ALL MONITORING-AND-RESPONSE PROGRAMS**

1. **GTSO Reporting Periods, Monitoring Year, and Hard Copies —** Beginning after completion of the GTSO Phase-In Period (under GTSO Section B), the landfill’s Reporting Periods and Monitoring Year shall be as follows. Each Monitoring Year’s “First Reporting Period” consists of the six-month period extending from ####-select-and-replace-with-start-date-for-first-6-month-long-date-range through ####-select-and-replace-with-1st-period’s-end-date, and its “Second Reporting Period” extends from ####select-and-replace-with-start-date through ####-select-and-replace-with-2nd-period’s-end-date. Thus, the facility’s “Monitoring Year” comprises these two Reporting Periods, beginning with the starting date of the First Reporting Period.

For each Reporting Period, its laboratory monitoring data, Compliance Spreadsheet, and Monitoring Report shall be uploaded to the facility’s GeoTracker account, within ####-select-and-replace-with-number-of-days days following the end of that Reporting Period, and the Annual Summary Monitoring Report is due concurrently with, and attached to, the Second Reporting Period’s Monitoring Report.

####-CLARIFYING-PAPERLESS-SUBMITTAL-POINT:--select-this-entire-paragraph-and-replace-it-with-a-new-one-either-saying-that-after-a-set-number-of-Reporting-Periods-(six-following-GTSO-Phase-In-should-do-nicely),-only-monitoring-report-PDF-uploads-will-be-required-(“paperless-office”-approach,-with-no-hard-copies-submitted)-unless-the-agency-notifies-the Owner/Operator-otherwise,-or-instead-saying-that-continued-ongoing-concurrent-submittal-of-a-physical-copy-and-an-uploaded-PDF-copy-of-each-such-monitoring-report-to-the-agency-is-required-until-the-agency-notifies-the-Owner/Operator-otherwise.-(Note-that-the-signature/stamp-page-can-be-a-grahic-image-insert-in-the-PDF-document-to-convey-submitter’s-certification-of-authenticity.-The-agency’s-legal-counsel-should-be-able-to-find-a-way-to-make-this-function-in-the-agency’s-state.)

2. **Uploads Begin & Data Analysis Methods Start Applying —** Beginning with the completion of the GTSO Phase-In Period, the Owner/Operator’s up-to-date Compliance Spreadsheet [GTSO ¶A.4. b] begins to be a required upload following each Reporting Period, with a copy included in the Monitoring Report for that Period. Likewise, the Annual Summary Monitoring Report starts including the Background Data Set Table [of GTSO ¶A.4.d(i)], Data Analysis Method Listing Table [of GTSO ¶A.4.d(ii)], and Retesting Declaration Table [of GTSO ¶A.4.d(iii)]. The first such Annual Summary Monitoring Report need address only the work done since completing the GTSO Phase-In.

Data analysis methods for COCs and Non-COCs include**:**

a. **Non-COC Testing (frequency = annual) —** The pre-assigned nonstatistical data analysis method described in GTSO ¶ C.4 and Fix-It Manual Appendix 2 for identifying any non-COC Appendix II constituents that should become COCs for the landfill. Such testing is done at the non-COC Field Points (see GTSO ¶A.8) during the Second Reporting Period of each Monitoring Year;

b. **FldPt/UnPar Testing (scheduled and unscheduled testing) —** The pre-assigned nonstatistical data analysis method for use on each UnPar at the UnPar-testing FldPts named in GTSO ¶C.6 uses as its CONCLIM (Concentration Limit or reference concentration value in the Spreadsheet) the upper 85th percentile of the background data set for that pair, under a clean-water Null Hypothesis that the pair’s then-current concentration, at that FldPt, does not warrant that UnPar being converted to serve, instead, as a groundwater MonPar. The first UnPar test occurs just prior to starting an Assessment Monitoring Program (AMP). Thereafter, UnPar testing will be done whenever indicated under GTSO ¶C.6. For details, see the Fix-It Manual’s Section 5.4 and its Appendix 2;

c. **Standard Status FldPt/MonPar Pair Testing (frequency = every few years, typically) —** A statistical or nonstatistical data analysis method that has been proposed-and-approved as part of the Concentration Limit Study for a given FldPt/COC pair, pursuant to Fix-It Manual Section 2.2. For a statistical method, use a pass-1-of-3 retesting approach. For a nonstatistical method, use a pass-1-of-2 retesting approach. Wherever feasible, statistical tests for any Standard Status FldPt/MonPar pair shall exhibit statistical power (as evidenced by a method-matching derived power curve) that equals or exceeds the appropriate USEPA Reference Power Curve for all release strengths at least three standard deviations above the background mean[[1]](#footnote-1). All Standard Status tests shall use a clean-water Null Hypothesis that the pair is in compliance with its respective Standard Status Concentration Limit (or, in a DMP, its Standard Status reference concentration), declared in Column 6 of the record for that FldPt/UnPar pair in the Compliance Spreadsheet.

Nevertheless, all Standard Status FldPt/MonPar pairs having no more than 10% of the pair’s background data points in excess of its reference MDL (that data set’s highest associated MDL value) shall use the CNSDAM approach described in Fix-It Manual Appendix 2 for Standard Status testing[[2]](#footnote-2);

d. **Release-affected FldPt/MonPar Pair Testing (frequency = each Reporting Period) —** The pre-assigned nonstatistical method for each Tracking Status FldPt/MonPar pair consists of the Concentration-Versus-Time Plot nonstatistical data analysis method described in Fix-It Manual Appendix 2, which method description also determines that pair’s declared Tracking Status CONCLIM value (in Spreadsheet Column 6). The plot features that CONCLIM concentration drawn as a horizontal line which serves as that pair’s cleanup goal under the dirty-water Null Hypothesis that the pair’s then-current concentration exceeds its cleanup goal concentration.

When the initial datum (for a given Reporting Period) and the resulting mid-Period retest datum both plot at-or-below the pair’s CONCLIM line, this constitutes an informal indication that the pair has been successfully remediated, so can use a clean-water Null Hypothesis for the formal compliance test at the end of the three-year Proof Period, once the pair enters Phase‑2 Proof Status. As a result, the pair shifts, automatically, to Phase-1 Proof Status, a change reflected by a change from “TRACKING” to “PHASE1” in the pair’s Compliance Spreadsheet record for that Reporting Period.

This data plotting continues to be applied in Phase‑1 Proof Status and during the three-year-long Proof Period in Phase‑2 Proof Status, but does not include hypothesis testing during that time period. Instead, the ongoing plotting serves to provide visual verification that the change to a clean-water Null Hypothesis, as of the pair’s entry in to Phase‑1 Proof Status, continues to be appropriate and that the pair appears to continue being ready for its end-or-Proof-Period compliance validation test; or

e. **Phase-2 Proof Status FldPt/MonPar Pair’s End-Of-Proof-Period Test —** A proposed and approved statistical (or, if need be, nonstatistical method) under a clean-water Null Hypothesis that tests that pair’s collected proof period data set against its background data set or its MCL-or-ACL Concentration Limit to identify a measurably significant increase.

The results of this testing are presented in a special table (see M&RP ¶F.2.g). Any release-affected FldPt/MonPar pair for which the clean-water Null Hypothesis is not rejected in this end-of-Proof-Period test has demonstrated, formally, that it has returned to compliance, with the result that the pair returns, automatically, to Standard Status testing as of the next Reporting Period. A pair for which that hypothesis is rejected indicates that the cleanup work is not complete, resulting in that pair’s returning, automatically, to Phase‑1 Proof Status as of the next Reporting Period.

3. **General Sampling and Retesting Protocol —** For any constituent that is subject to testing during a given Reporting Period at a given Field Point, the initial sample shall be obtained within the first 10 days of that Period.

a. **Methods Subject to Retesting —** For any data analysis method that uses a retesting approach, if the initial sample’s concentration, when subjected to its approved data analysis method, produces a preliminary indication (as defined by the test method), then a retest sample for that constituent is obtained at that FldPt at mid-Period and the test is redone.

(i) **Nonstatistical Methods**[[3]](#footnote-3) **—** For a nonstatistical method (under a pass-1-of-2 retesting approach), the single retest’s result determines the outcome of the test, as follows. If the single retest verifies the preliminary indication, then, as detailed in Fix-It Manual Subchapter 2.3**:** **1)**for a non-COC constituent, the constituent becomes a new COC, following approval of its Concentration Limit Studies (at each FldPt); **2)** for a Standard Status FldPt/MonPar pair under the CNSDAM approach, that pair changes to Tracking Status automatically; **3)**for a Tracking Status FldPt/MonPar pair under the Concentration-Versus-Time-Plotting nonstatistical method, the pair changes to Phase‑1 Proof Status automatically; or, **4)**for a FldPt/UnPar pair under the Upper 85th Percentile of Background nonstatistical method, the constituent automatically becomes, instead, a MonPar at all groundwater FldPts. In the absence of such verification, the preliminary indication is invalidated and no change occurs.

(ii) **Statistical Methods —** For a statistical method (under a pass-1-of-3 retesting approach) applied to a Standard Status FldPt/MonPar pair *(see* **MonPar Monitoring** *in Fix-It Manual Subchapter 2.3)*, an exceedance of the pair’s CONCLIM value by the sample taken at the start of the Reporting Period results in retesting. If the first (mid-Period) retest countermands the preliminary indication, then the pair is not in violation of its Standard Status CONCLIM, so retesting ends and the pair remains in Standard Status. Whereas, if the first retest agrees with the preliminary indication, then the second retest sample (for that pair) is obtained just prior to the end of the Period and its test result decides the issue**:** if the 2nd retest agrees with the preliminary indication, then the pair changes to Tracking Status automatically**;** otherwise, the pair remains in Standard Status.

Regardless of the test outcome, any FldPt/MonPar pair for which the 2nd retest option is invoked is not subject to sampling and analysis at the start of the next Reporting Period. Thus, in order to avoid adverse serial correlation effects, if a laboratory determination is made for that FldPt/MonPar pair, unintentionally, at the start of that next Reporting Period as a result of testing another closely-related constituent at that FldPt, the resulting data point for that FldPt/MonPar pair is reported but is not subjected to testing.

b. **Methods That Use No Retesting —** For a release-affected FldPt/MonPar pair in Phase‑2 Proof Status, the statistical or nonstatistical test done at the end of the three-year-long Proof Period *(see* **Phase‑II Proof Status***in Fix-It Manual Subchapter 3.1)* is outside of the scope of the normal testing approaches because the test involves all data collected quarterly during that Proof Period plus all data, for that pair, back to an initial date specified by the Owner/Operator. Such a test needs and uses no retesting (i.e., it is under a pass-1-of-1 approach). The results of this testing is presented in a special table (see M&RP ¶F.2.g). Passing the test results in the pair returning to Standard Status; failing the test causes the pair to return to Phase‑1 Proof Status.

Likewise, if the Owner/Operator has proposed a parametric statistical method, for Standard Status testing, that references the mean of two new data points (collected at the start of the Reporting Period and at mid-Period) against a CONCLIM value calculated to reflect that mean-of-2 approach, no retest is possible or required.[[4]](#footnote-4)

4. **Testing for New Appendix II COCs —** Each Monitoring Year, during the first ten days of the Second Reporting Period, the Owner/Operator shall test a sample from each Non-COC Field Point listed in GTSO ¶ A.8 to determine whether there are any additional Appendix II constituents that should become COCs for the landfill, using the Nonstatistical Non-COC Testing Method described in Fix-It Manual Appendix 2, and shall subject any new COC so identified to a Concentration Limit Study (meeting Fix-It Manual Subchapter 2.2) at each FldPt. *(See also Fix-It Manual Subchapter 4.2).*

5. **Test FldPt/MonPar Pairs Each Reporting Period —** Each Monitoring Parameter (MonPar) shall be tested each Reporting Period after GTSO Phase‑In at each groundwater FldPt by comparing its derived CONCLIM value to the MonPar’s then-current concentration at that FldPt. Given a preliminary indication of a Compliance Status change, the Owner/Operator shall proceed with the retesting approach approved for that pair and method. For each FldPt/MonPar pair tested, any resulting Compliance Status change is reflected in that pair’s STATUS column entry in the Compliance Spreadsheet for the Reporting Period in which the testing was done.

An exception to the six-monthly Reporting Period and retesting occurs near the end of a Corrective Action Program, in that the three-year-long Proof Period of quarterly sampling (that applies only to release-affected pairs in Phase‑2 Proof Status) serves as a special long-duration Reporting Period applicable only to those Phase‑2 Proof Status FldPt/MonPar pairs, and the end-of-Proof-Period test, which uses no retesting, is isolated from all other testing. The results of this end-of-Proof-Period testing are reported in a special table [see M&RP ¶F.2.g] and any resulting Compliance Status changes are reflected in that pair’s STATUS column entry in the Compliance Spreadsheet for the Reporting Period when the testing was done.

Whenever a MonPar is tested, the Owner/Operator shall also sample all background FldPts for that MonPar.

6. **Scheduled and Unscheduled UnPar Testing at Specified FldPts —** If the landfill is in a Detection Monitoring Program (DMP) when the GTSO Phase‑In is completed, the Post-Phase-In UnPar COCs are tested first just prior to the start of the AMP. After the start of the AMP, all UnPar COCs are tested every ####-replace-with-chosen- multi-year-interval years following the start of the AMP during that Monitoring Year’s First Reporting Period. All UnPar testing is limited to the following UnPar-testing FldPts**:**  ####-select-and-replace-with-the-GeoTracker-names-of-the-two-most-ideally-located-(for-showing-a-release-affect)-compliance-well-FldPts. All UnPar testing uses the Nonstatistical Upper 85th Percentile Of Background data analysis method described in Fix-It Manual Appendix 2 and further discussed in GTSO ¶C.2.b.

This multi-year UnPar sampling interval, together with the selected UnPar-Testing FldPts, are adopted for this landfill pursuant to 40 CFR §258.55(b) and, the sampling interval is adopted following consideration of the issues listed under Federal Rule §258.55(c) plus any additional considerations that the agency considers relevant.

Whenever an UnPar is tested, the Owner/Operator shall also sample all background FldPts for that UnPar.

Even though UnPar testing occurs only at the above-named two (UnPar-testing) FldPts, each UnPar shall have a record, in the facility Compliance Spreadsheet, for each of the landfill’s FldPts. For each FldP/UnPar pair in the Spreadsheet for a FldPt that is not an UnPar-testing FldPt, its place-holder status (for use should that pair become a FldPt/MonPar pair, in the future) shall be indicated by the fact that there is no entry in the CONCLIM field (Column 6) for the Spreadsheet record for that pair.

In addition to this scheduled UnPar testing, the Owner/Operator shall conduct the following unscheduled UnPar tests at the above-named UnPar-testing FldPts using this same data analysis method**:**

a. **New UnPar COCs Only —** For each new UnPar COC identified under GTSO ¶ C.4 after the start of the AMP, the Owner/Operator shall test that new UnPar at the UnPar-Testing FldPts during the first Reporting Period following approval of the Concentration Limit Studies for that UnPar. This test does not involve pre-existing UnPars;

b. **First Release Indication In An DMP —** If the landfill completes the GTSO Phase-In work while in a Detection Monitoring Program (DMP), then, in preparation for beginning an AMP, following a verified release indication in a DMP, the Owner/Operator shall test all UnPars at the UnPar-Testing FldPts named above at the start of the next Reporting Period; and

c. **First Release Indication After Starting An AMP —** After starting an AMP, during the Reporting Period following the first instance where a FldPt/MonPar pair transitions from Standard Status to Tracking Status, the Owner/Operator shall test all UnPars at the UnPar-Testing FldPts named above — see GTSO ¶E.1.b.(i).

7. **Responses Applicable During All Monitoring Programs —** For each of the following specific occurrences, the Owner/Operator shall notify the designated agency contact immediately (by phone or email), shall describe the occurrence in the Monitoring Report for that Reporting Period (including a note on that report’s summary page), shall note it in the Annual Summary Monitoring Report, and shall take the following additional actions, regardless of which monitoring program (DMP, AMP, or AMP&CAP) the landfill is in at the time.

a. **Event: A New COC is Found —** The Owner/Operator identifies a new COC via annual testing at a Non-COC Field Point, pursuant to GTSO ¶C.4, resulting in the initiation of a Concentration Limit Study meeting Fix-It Manual Subchapter 2.2 for that new COC at each FldPt. All of the Concentration Limit Studies for a given COC are integrated into a combined Study that is submitted as part of the Monitoring Report for the Reporting Period when the Study for the last FldPt/COC pair (for that new COC) is completed. For each group of such Studies that is approved, rejected, or approved with changes, that response is noted in the Monitoring Report for the Reporting Period when the response was received.

The new COC begins functioning as a MonPar at all FldPts, if a VOC, or as an UnPar otherwise at the subset of UnPar-testing FldPts listed in GTSO ¶C.6, during the Reporting Period following the date when these Studies are approved. The Owner/Operator reflects this change in the Compliance Spreadsheet for this first-use Reporting Period — i.e., the new FldPt/COC pairs begin to be included in the Spreadsheet.

After the start of an AMP, any new UnPar, undergoes its own UnPar test at the UnPar-Testing FldPts during that first-use Reporting Period (see GTSO ¶C.6.c).

b. **Event: An UnPar Becomes a MonPar Instead —** In preparation for beginning and AMP, or after having started an AMP, a groundwater UnPar converts to being a MonPar at all groundwater FldPts upon failing its UnPar test at any UnPar-testing FldPt (see GTSO ¶C.6). In the facility’s Compliance Spreadsheet for that Reporting Period, that COC’s MONPAR\_UNPAR column valid-value entry in the constituent’s record for each FldPt at that landfill changes from “UNPAR” to “MONPAR” and its entry in the STATUS column of each such record changes from none (blank) to “STANDARD.” This change affects all groundwater FldPts at that landfill, including those FldPts not subject to UnPar testing under GTSO ¶C.6. Each such new FldPt/MonPar pair begins being tested as such as of the next Reporting Period against a CONCLIM value (entered, for that Period, in the pair’s Compliance Spreadsheet record). Either**:**

(i) **Standard Status Testing Against Background —** The FldPt/MonPar pair not using an MCL-or-ACL Concentration Limit, so its CONCLIM value is determined by applying its pre-approved Standard Status data analysis method (proposed and approved as part of that pair’s Concentration Limit Study) to its reference background data set, or to its alternative background data set (for a FldPt/MonPar pair with an MCL-or-ACL Concentration Limit, that opts to test relative to its alternative background data set — see Subchapter 6.3 of the Fix-It Manual); or

(ii) **Standard Status Testing Against an MCL-or-ACL CONCLIM —** Where a Standard Status FldPt/MonPar pair has an MCL-or-ACL Concentration Limit and the Owner/Operator has chosen to use it for Standard Status testing, the pair uses that MCL-or-ACL as its CONCLIM.

In a case where a COC is an UnPar at two landfills at the same facility, the UnPar-to-MonPar transition occurs at both landfills simultaneously only if the verified UnPar test indication occurs at a FldPt that both landfills use as a designated UnPar-testing FldPt.

c. **Event: A New Compliance-Testing Field Point is Established —** The Owner/Operator establishes a new compliance-testing Field Point, either on his/her own motion or as directed by the agency. As a result, the Owner/Operator begins a Concentration Limit Study (meeting Fix-It Manual Subchapter 2.2) there for each of the landfill’s COCs. Upon these Concentration Limit Studies being approved, the COCs begin functioning at that new FldPt as of the next scheduled Reporting Period, implementing the separation of MonPar COCs versus UnPar COCs that is then in effect at that landfill. The UnPars, at that new FldPt, are first tested by themselves that next Reporting Period, as indicated in GTSO ¶C.6, even if the other UnPars are not scheduled for testing.

d. **Event: A Preliminary Indication Results in Retesting —** An initial test results in a preliminary indication**:** **1)**for a non-COC Appendix II constituent; **2)**for a FldPt/UnPar pair; or **3)**for a FldPt/MonPar pair in Standard Status or Tracking Status. In addition to any other event-specific responses (in this GTSO), the Owner/Operator follows the applicable retesting approach, establishes a test conclusion, includes that conclusion in the Monitoring Report for that Reporting Period, enters the initial-test-and-retest event in the Retesting Table [see GTSO ¶A.4.d(iii)] for that year’s Annual Summary Monitoring Report, and proceeds in accordance with the results of that test.

e. **Event: There is an Untoward Increase at a Groundwater Background FldPt —** The current data point for a COC from a given background Field Point well exceeds the maximum value of all previous data for that COC from that background Field Point, not including any datum that initiated this check during any prior Reporting Period. As a result of this occurrence, the Owner/Operator resamples that background Field Point for that COC at mid-Period. If the retest datum does not exceed that highest prior concentration, then there is no change.

However, if the retest datum also exceeds that highest prior concentration, then the Owner/Operator initiates a Source Study, automatically, that identifies whether that sustained concentration increase is caused by a release from the landfill. Unless the agency allows a later submittal date, that Source Study is due as part of the Monitoring Report for the Reporting Period following the one when the condition was confirmed. In response to this submittal**:**

(i) **The Landfill is not the Source —** If the Source Study convinces the agency that the COC’s concentration increase comes from a source other than the landfill (e.g., the constituent is a VOC whose concentration increases, in soil-pore gas or groundwater samples, as one proceeds further upgradient from the background well), then the agency switches all well FldPt/COC pairs, for that COC, to the use of an Int**er**well background data set (to derive its Concentration Limit) that is based upon the current and newly acquired data from that background well, and establishes an appropriate statistical or nonstatistical data analysis method to apply to this new Interwell background data set in the testing of each downgradient FldPt well; or

(ii) **The Landfill is Likely the Source —** If the Source Study fails to convince the agency that the increase results from a source other than the landfill, then the agency**:** **1)** declares that this background well shall cease functioning as a source of new Interwell background data, for that COC**;** **2)** if the constituent is a groundwater UnPar for that landfill, converts it to being a groundwater MonPar (here and at each compliance-testing Field Point)**;** **3)** makes that background-well/COC pair into a new Standard Status FldPt/MonPar pair with a CONCLIM value derived from an Intrawell background data set consisting of at least eight data points from that background-well/COC pair taken prior to the indication event (testing for that MonPar is abated until this reference background data set is obtained)**;** **4)** requires any other suitable changes to the landfill’s background well system**;** and **5)** as of the next Reporting Period following the establishment of the Interwell background data set, that new Standard Status FldPt/MonPar pair begins being tested, has a new record in the Compliance Spreadsheet, is reflected in that Monitoring Year’s Annual Summary Monitoring Report’s three tables (see GTSO ¶A.4.d), and each FldPt for that new MonPar begins being tested relative to a new CONCLIM value based upon the new Interwell background data set.

f. **Event: The Agency Approves A Background Data Set Revision —** The agency approves a background data set revision, proposed under GTSO ¶ C.8. In this case, the background-based CONCLIM value for that FldPt/COC pair (or, for a Standard Status pair with an MCL-or-ACL Concentration Limit, the CONCLIM derived from its revised alternative background data set) becomes effective during the Reporting Period following its approval, with the result that the value entered in the CONCLIM column for that pair, in the Compliance Spreadsheet for that first-use Period, is revised, if needed[[5]](#footnote-5), to reflect the application of the approved data analysis method to its revised background data set. Likewise, in the Annual Summary Monitoring Report for that Monitoring Year, the Background Data Set Table [see GTSO ¶ A.4.d(i)] presents that FldPt/COC pair’s revised background data set, and that report’s Data Analysis Method Table [see GTSO ¶ A.4.d(ii)] is revised to reflect any approved change to the data analysis method applicable under that revised reference background data set.

8. **Three-Yearly Background Data Set Updating Process —** Beginning in the Second Reporting Period of the Monitoring Year that occurs three full years after the date when the GTSO Phase-In Period ends, and repeating every three years thereafter, the Owner/Operator shall propose and substantiate updates to the background data set (or alternative background data set, for a Standard Status FldPt/MonPar pair having an MCL-or-ACL Concentration Limit) for each FldPt/COC pair having at least four prospective new background data points. For each such FldPt/COC pair, the updating effort shall be done as described in Subchapter 5.6 of the Fix-It Manual. If need be, each such proposal shall include proposed updates to that pair’s data analysis method and a revised CONCLIM value for use in the event the data-addition proposal is approved.

In a case where the oldest background data points for a given FldPt/COC pair are compromised by their reliance upon elevated MDL and PQL values (compared to those used on more recently acquired data points), the Owner/Operator’s proposed update shall call not only for the addition of the proposed new data points but also for the same number of the oldest data points.

9. Beginning with the first Reporting Period following Phase-In and extending until all GTSO elements are formally adopted into the permit M&RP, each Monitoring Report shall include an appropriately named section that presents an ever-accruing list of all portions of the M&RP that have been superseded by any portion of this GTSO. In each instance, the Owner/Operator shall name the paragraph number of the superseded M&RP standard, shall name the GTSO paragraph number of the standard that has taken its place, shall provide a brief explanation of the logic behind that supersedure, and shall include a brief announcement of this change in the body of the Monitoring Report (for that Reporting Period) and shall note it in the report’s summary pages.

**D. ADDITIONAL GTSO REQUIREMENTS APPLICABLE PRIOR TO MOVING INTO AN AMP**

1. **Event: For the First Time, a Preliminary Release Indication Is Verified By Retesting During a DMP —** The first time, during a Detection Monitoring Program (DMP), that a FldPt/MonPar pair transitions from Standard Status to Tracking Status at the landfill, the Owner/Operator shall notify their agency contact immediately (by phone or email), shall describe the occurrence in that Reporting Period’s Monitoring Report (including a note on that report’s summary page), shall note it in the Annual Summary Monitoring Report, and shall take the following additional actions**:**

a. subject each UnPar pair to testing at each UnPat-testing FldPt named in GTSO ¶ C.6, using the data analysis method therein named. Any UnPar COC that fails this test enters the AMP as a Standard Status MonPar at each groundwater FldPt and will use the Standard Status data analysis method pre-approved in its Concentration Limit Study. This pre-AMP UnPar test is not repeated in response to any additional FldPt/MonPar pairs that provide a verified release indication prior to the start of the AMP; and

b. Prepare to begin complying with GTSO Section E at the start of the Reporting Period following the one during which the release was discovered. If the Owner/Operator chooses to invoke the option to make a demonstration that the landfill is not undergoing a release, in spite of the verified release indication, the Owner/Operator shall notify the agency of that intent within a week of the precipitating indication, shall submit that demonstration to the agency no later than 80 days following the date the release indication was verified by retesting, and shall include a copy of the demonstration in the Monitoring Report for the Reporting Period when it was submitted. Upon receiving this demonstration, the agency will complete its review within the next 10 days. If the agency is persuaded by the demonstration, then the agency will notify the Owner/Operator that landfill shall remain in a DMP.

2. **GTSO Section D Stops Applying Upon Entering AMP —** In a case where the Owner/Operator has met GTSO ¶D.1 and either does not invoke the optional demonstration or the agency is not persuaded by that demonstration, then GTSO Section E begins to apply and this Section D ceases to apply as of the Reporting Period following the verified release indication. Given a successful completion of the Corrective Action, GTSO Section C remains inapplicable unless/until the landfill has completed its AMP and moved back to a Detection Monitoring Program, pursuant to GTSO ¶E.3.

**E. ADDITIONAL GTSO RESPONSES APPLICABLE UNDER AN AMP** —The following actions/responses are in addition to those listed under GTSO ¶ C.7 and apply only during an Assessment Monitoring Program (AMP).

1. **Critical Event Responses —** For each of the following specific occurrences, the Owner/Operator shall notify their agency contact immediately (by phone or email), shall describe the occurrence in that Reporting Period’s Monitoring Report (including a note on that report’s summary page), shall note it in the Annual Summary Monitoring Report, and shall take the following additional actions, if listed. The specific occurrences include**:**

a. **Event: The AMP begins —** When the landfill transitions from a DMP to an Assessment Monitoring Program (AMP)**:**

(i) **Reset Release-affected Pairs —** The Owner/Operator shall revise the facility’s Compliance Spreadsheet, during the landfill’s first Reporting Period in the AMP, to reset all of that landfill’s FldPt/MonPar pairs to Standard Status prior to conducting the Standard Status testing for that Reporting Period;

(ii) **Each Pair’s Concentration Limit Begins Applying —** Throughout the AMP, including any time when an AMP is running concurrently with a Corrective Action Program (CAP), the Concentration Limit for each FldPt/COC pair shall be its MCL-or-ACL or, in the absence of such an applicable reference concentration, its Concentration Limit shall be derived from its background data set via the application of an approved data analysis method.

Nevertheless, for any FldPt/MonPar pair having an MCL-or-ACL Concentration Limit, the Owner/Operator can make use of its alternative background data set on an interim basis to facilitate Standard Status testing for that pair, if that use was proposed in that FldPt/COC pair’s Concentration Limit Study, in which case the reference concentration derived from that alternative background data set shall be the CONCLIM value shown in the record for that Standard Status FldPt/MonPar pair in the facility Compliance Spreadsheet.

In a case where the Owner/Operator did not so propose (the use of the pair’s alternative background data set in that pair’s Concentration Limit Study), they can propose such use, including a suitable statistical or nonstatistical background-based data analysis method, as part of any post-DMP Monitoring Report and the resulting alternative-background-based reference concentration shall take the place of the MCL-or-ACL Concentration Limit for that pair, for Standard Status testing only, beginning with the Reporting Period following the one when it was approved;

b. **Event: First Retest-Verified CONCLIM Exceedance in an AMP —** Following the reset of all release-indicating FldPt/MonPar pairs from Tracking Status to Standard Status at the start of the AMP [see GTSO ¶ E.1.a.(i)], the first time thereafter that a FldPt/MonPar pair transitions from Standard Status to Tracking Status, the Owner/Operator**:**

(i) shall test all UnPars, pursuant to GTSO ¶C.6.c, at the FldPts named for that purpose under GTSO ¶C.6. Any UnPars that transition to being MonPars at all FldPts, as a result of this test, begin to function in that capacity as of the Reporting Period following the test; and

(ii) immediately shall initiate preparation for a Corrective Action Program (CAP) — pursuant to Federal Rule §258.55(g), §258.56, and §258.57 — even if the MonPar involved is not an Appendix II constituent, in preparation for the agency to adopt a CAP meeting Federal Rule §258.58. As part of the Monitoring Report for the second Reporting Period following this CONCLIM exceedance, unless the agency allows a later due date, the Owner/Operator shall submit a proposal containing all information necessary for the agency to adopt a CAP, including, but not limited to**:** a delineation of the nature and extent of the release; a proposed suite of Corrective Action Measures (CAMs); and a proposed timeline of effectiveness-validation milestones for each such CAM. In the interval prior to adoption of the CAP, the Owner/Operator shall implement any interim CAMs that the agency imposes or approves;

c. **AMP-Only Event: New Constituent Involved —** For a landfill that has undergone its first retest-verified CONCLIM exceedance in an AMP, but is not yet implementing a CAP, any time an additional MonPar becomes part of the release (by transitioning from Standard Status to Tracking Status for the first time since the start of the AMP), the Owner/Operator**:** shall update that pair’s STATUS entry accordingly in the facility’s Compliance Spreadsheet and shall review the proposed CAMs to assure that they will prove effective in remediating all released constituents, including this new one**;** shall include that analysis, together with any proposed CAMs revision, in the Monitoring Report for the Reporting Period following the pair’s transition to Tracking Status**;** and shall include that change in the Monitoring Year Retesting Declaration Table in the Annual Summary Monitoring Report; and

d. **Event: Groundwater Plume Change For A Known Release Constituent —** Each time another FldPt/MonPar pair changes from Standard Status to Tracking Status for a MonPar that entered Tracking Status at any other FldPt during a prior Reporting Period, the response includes noting that change via an update to that pair’s STATUS entry in the Compliance Spreadsheet and including it in the Monitoring Year Retesting Declaration Table in the Annual Summary Monitoring Report.

2. **Monitoring Report Includes Plots —** Beginning with the inception of the AMP, the Owner/Operator shall include in each Monitoring Report an up-to-date concentration-versus-time plot (see Fix-It Manual Appendix 2) for each FldPt/MonPar pair that left Standard Status after the start of the AMP. Each such plot shall have its vertical (concentration) scale adjusted to show both its concentration variation throughout its history effectively, and whether that concentration plot line is trending down toward the pair’s cleanup goal, which goal is plotted as a horizontal line and is listed as that pair’s current CONCLIM in its record in the facility Compliance Spreadsheet. During a combined AMP and Corrective Action Program (CAP), this requirement is satisfied for the Monitoring Year’s Second Reporting Period by including these plots in the CAMs Effectiveness Report that is part of the Annual Summary Monitoring Report, pursuant to GTSO ¶F.3.

3. **After the Landfill Successfully Completes a CAP —** Following completion of the CAP, the Owner/Operator shall submit a proposal, as part of the Monitoring Report for the Reporting Period when the agency declares the landfill’s CAP to be complete**:** **1)**that affirms the continued use, for the time being, of all MonPars that were serving in that capacity at the end of the CAP; **2)**that proposes a plan for affirming that the landfill has met the requirements of Federal Rule §258.55(e) and can return to a Detection Monitoring Program (DMP); and **3)**that proposes which release-affected groundwater MonPars should remain MonPars, once the agency determines that the landfill has met Federal Rule §258.55(e) and returns it to a DMP. The groundwater MonPars, under this DMP, shall include all VOC COCs, all COCs having an MCL-or-ACL Concentration Limit, and the nonhazardous inorganic COCs that will serve as metals surrogates; whereas, all other COCs shall become UnPars.

The Owner/Operator shall begin implementing the plan [to meet §258.55(e)] upon approval by the agency. The Owner/Operator shall note the agency’s response to this proposal in the Monitoring Report for the Reporting Period in which the response was received. Likewise, the Owner/Operator’s eventual declaration of having meet §258.55(e), together with the agency’s response to that declaration, shall be included, respectively, in the Monitoring Report for the Reporting Period(s) in which they occur.

Upon receiving notice of the agency’s determination that the landfill has met §258.55(e), the Owner/Operator shall implement this revised DMP pursuant to GTSO Section C, beginning at the start of the next Reporting Period, at which point this section (GTSO Section E) shall cease to apply to the landfill.

**F. ADDITIONAL GTSO REQUIREMENTS APPLICABLE ONLY UNDER A CORRECTIVE ACTION PROGRAM (CAP) —** The following actions and responses are in addition to those listed under GTSO ¶¶ C.7 and E, and address events that can occur only during, or just prior to, a Corrective Action Program (CAP).

1. **CAP Beginning —** In a case where the Owner/Operator has proposed a CAP, that program shall begin at the start of the Reporting Period following the agency’s approval of that proposal and adoption of the elements in GTSO ¶F.4. That CAP can include a time schedule for addressing any components of the proposed CAP that the agency has determined were either missing from, or inadequate in, the Owner/Operator’s CAP proposal.

The essential goal of the suite of Corrective Action Measures (CAMs) adopted for, and applied during, the CAP is to bring all groundwater at and surrounding the release-affected FldPt wells back into compliance, as indicated by each release-affected FldPt/MonPar pair having returned to Standard Status.

2. **Additional Event Responses During a CAP —** For each of the following specific occurrences, during a CAP, the Owner/Operator shall notify their agency contact immediately (by phone or email), shall describe the occurrence in that Reporting Period’s Monitoring Report (including a note on that report’s summary page), shall note it in the Annual Summary Monitoring Report, shall make all suitable changes to the facility’s Compliance Spreadsheet, and shall take the following additional actions, if listed. The specific occurrences include**:**

a. **Event: The Groundwater Plume Expands —** In addition to the response listed under GTSO ¶E.1.d, each time during a CAP when a FldPt/MonPar pair changes from Standard Status to Tracking Status for any FldPt well that, prior to that point, had all of its MonPars in Standard Status, the Owner/Operator shall identify that occurrence, in the Monitoring Report for that Reporting Period, as an expansion of the groundwater plume into portions of the aquifer previously unaffected by the release;

b. **Event: A New Release Constituent Becomes Involved —** Each time, during a CAP, that a MonPar that was in Standard Status at all FldPts transitions to Tracking Status at one or more FldPts, the Owner/Operator shall submit an evaluation of the existing CAMs to determine whether they will address the remediation of that new release constituent effectively. This analysis shall be included in the following Reporting Period’s Monitoring Report. Unless the Owner/Operator’s CAMs evaluation can make a convincing argument that the existing CAMs are adequate, the proposal shall propose a revised suite of CAMs that, once applied, will result in a notable remedial response for all COCs involved in the release. Any proposed revised CAMs become effective upon approval.

The Owner/Operator shall summarize the agency’s response to this proposal in the Monitoring Report for the Reporting Period when the response is received;

c. **Event: A Release-affected FldPt/MonPar Pair Enters Phase‑1 Proof Status —** During a CAP, whenever a release-affected FldPt/MonPar pair transitions from Tracking Status to Phase‑1 Proof Status, under the Concentration-Versus-Time-Plotting nonstatistical data analysis method [see Fix-It Manual Appendix 2], in addition to the responses listed under GTSO ¶C.2.d, the Owner/Operator shall note this change in theCAMs Report for that year, under GTSO ¶F.3;

d. **Event: A Suitable Group of Phase‑1 Proof Status Pairs is Ready to Demonstrate Having Returned to Compliance —** Whenever the Owner/Operator determines that there are enough release-affected FldPt/MonPar pairs in Phase‑1 Proof Status to warrant a formal compliance demonstration, the Owner/Operator shall propose that change to the agency. If the agency agrees, then the Owner/Operator shall transition the selected Phase‑1 Proof Status FldPt/MonPar pairs to Phase‑2 Proof Status, beginning with the start of the next Reporting Period;

e. **Event: A Group of Release-affected Pairs Enters Phase‑2 Proof Status —** Upon transitioning the selected release-affected FldPt/MonPar pairs to Phase‑2 Proof Status, the Owner/Operator shall**:**

(i) **Update the Spreadsheet —** change the STATUS valid-value entry, in the facility Compliance Spreadsheet for that Reporting Period, from “PHASE1” to “PHASE2,” for each Phase‑2 Proof Status FldPt/MonPar pair;

(ii) **Start the Proof Period —** begin a three-year-long Proof Period of quarterly monitoring for each Phase‑2 Proof Status FldPt/MonPar pair. Each such new datum is entered on the concentration-versus-time plot for that pair; and

(iii) **Propose the Data-Collection Start Date and Test Methods —** well prior to the end of the Proof Period, the Owner/Operator shall include in the then-current Monitoring Report a proposal addressing all of the below-listed points for each Phase‑2 Proof Status FldPt/MonPar pair separately [see GTSO ¶ C.2.e, and the Fix-It Manual’s Figure 5 and Subchapter 3.5]. The proposal becomes effective upon approval, so long as that approval is noted in the Monitoring Report for the Reporting Period during which the approval was received. The proposal shall include, for each release-affected FldPt/MonPar pair, respectively**:**

(a) **Propose a Data-Accrual Start Date —** the date on-and-following-which all data collected, for that release-affected FldPt/MonPar pair, is to be included as part of that pair’s Proof Period data set (e.g., the beginning date of the Reporting Period when that pair changed from Tracking Status to Phase‑1 Proof Status);

(b) **Propose an End-of-Proof-Period Test Method —** a detailed description of proposed end-of-Proof-Period test method for each respective release-affected pair. For a data analysis method that will be used by two or more such pairs, the proposal can list the pairs to be included under that method, rather than repeating the proposal for each pair, so long as the proposal identifies all relevant pair-specific considerations and data analysis parameter settings and validates the appropriateness of that method individually for each pair to which it is to be applied. The method shall be a statistical method if that pair would use a statistical method for Standard Status testing, shall be configured as a one-tailed test looking to identify a significant increase (over the background data set, MCL, or ACL, as appropriate) for that pair and, for a statistical method, shall be done at an alpha (false-positive error rate) of no less than 0.01 (i.e., a confidence level no less than 99%); and

(c) **Propose a Standard Status Test Method —** a detailed description of an appropriate test method [see GTSO ¶ C.2.c] proposed for use on that FldPt/MonPar pair should it complete its end-of-Proof-Period test successfully and return to being tested as a Standard Status FldPt/MonPar pair. Just as with the end-of-proof-period test method proposals, groups of pairs can share a proposed Standard Status data analysis method description so long as all relevant pair-specific considerations and settings are addressed.

In a case where a FldPt/MonPar pair having an MCL-or-ACL Concentration Limit will be using the pair’s Proof Period data set as a surrogate Intrawell alternative background data set for subsequent Standard Status testing (see Fix-It Manual Subchapter 6.3), the proposal shall state this, and shall begin listing that Proof Period data set as the pair’s alternative background data set in the Background Data Set Table, shall list the resulting reference concentration as the CONCLIM value for that pair (in the Spreadsheet), and shall list that method for the pair in the Data Analysis Method Table included in the Annual Summary Monitoring Report for that Monitoring Year;

f. **Event: A Proof-Period Ends —** When the Proof Period ends, the Owner/Operator implements the approved end-of-Proof-Period data analysis approach for each release-affected FldPt/MonPar pair, respectively. Pairs for which the clean-water Null Hypothesis is not rejected pass the test and transition to Standard Status; whereas, pairs for which this Null Hypothesis is rejected fail the test and return to Phase‑1 Proof Status, but can re-enter Phase‑2 Proof Status with a later group of release-affected pairs when the Owner/Operator deems such a retest appropriate.

The Monitoring Report for that Reporting Period shall include an End-Of-Proof-Period Test Results table as described in the Fix-It Manual’s Subchapter 3.5 and shown in its Figure 5. Likewise, the facility’s Compliance Spreadsheet for that Reporting Period shall reflect the revised compliance status of each FldPt/MonPar pair subjected to this testing — i.e., the STATUS valid-value for each pair so tested changes either to “PHASE1,” for a pair that failed its test, or to “STANDARD,” for each pair that passed its test;

g. **Event: A FldPt/MonPar Pair Enters Tracking Status After the Other Release-affected Pairs Have Entered Phase‑2 Proof Status —** In a case where all remaining release-affected FldPt/MonPar pairs are in Phase‑2 Proof Status when a new release-affected pair is identified (i.e., it changes from Standard Status to Tracking Status), the Phase‑2 Proof Status work continues. However, after the end-of-Proof-Period testing is completed, the landfill’s Corrective Action Program (CAP) continues; and

h. **Event: There Are No More Release-affected FldPt/MonPar Pairs —** Once all release-affected FldPt/MonPar pairs have passed their end-of-Proof-Period test and transitioned back to Standard Status, the Owner/Operator shall request the agency to terminate the CAP, together with all active CAMs except for those that the agency determines need to be converted to ongoing operational measures in order to avoid the development of a new release [see Fix-It Manual Subchapter 12.5]. This petition shall be included in the Monitoring Report(s) for the Reporting Period(s) in which the last release-affected FldPt/MonPar pair transitions back to Standard Status.

Upon termination of the CAP, the Owner/Operator shall begin implementing GTSO Subparagraph E.3 and this section (GTSO Section F) ceases to apply.

3. **CAMs Effectiveness Report —** Throughout the duration of the CAP, the updated suite of concentration-versus-time plots [for each release-affected FldPt/MonPar pair that is included in the Monitoring Report, pursuant to GTSO ¶ C.2.d], shall instead, for the Second Reporting Period of each Monitoring Year, be included in a CAMs Effectiveness Report in the Annual Summary Monitoring Report (that is attached to that Period’s Monitoring Report). The CAMs Effectiveness Report, in addition to those plots, shall include a discussion of the effectiveness with which the Corrective Action Measures (CAMs) are bringing each of the landfill’s release-affected FldPt/MonPar pairs back into compliance.

That discussion, in addition to identifying release-affected FldPt/MonPar pairs that have responded favorably to the CAMs, or are in the process of doing so, shall identify all FldPt/MonPar pairs that are not providing such a response.

Given any FldPt/MonPar pair(s) exhibiting a poor ongoing response to the existing CAMs, the discussion shall propose additional and/or replacement CAMs designed to bring about a observable remediation response by all release-affected FldPt/MonPar pairs. Proposed changes to the CAMs become effective upon approval. The agency’s response to the proposed CAMs changes shall be described in the Monitoring Report for the Reporting Period in which the response was received and that response shall be noted in the next Annual Summary Monitoring Report.

4. **Additional Adopted Components of the CAP** — The following new GTSO requirements were duly and regularly adopted as components of the landfill’s CAP by the [####During-CAP-Adoption:-replace-with-agency- name] at a public meeting held on [####During-CAP-Adoption:-replace-with-CAP-adoption-date] at [####During-CAP-Adoption:-replace-with-meeting-location] to meet the remedy selection and public process requirements of Federal Rule §258.57 and establish a CAP meeting Federal Rule §258.58*.*

a. [####During-CAP-Adoption:-list-here-and-below-the-CAP-components-not-included-in-GTSO-¶¶F.1-to-F.3,-above,-such-as-the-list-of-CAMs-and-a-schedule-for-their-milestones,-plus-an-item-and-deadline-schedule,-if-needed,-for-making-up-any-defficiencies-in -the-Owner/Operator’s-CAP-proposal]

b. . . . .

c. . . . .

1. The ***Sanitas*** software can make these plots for the user for methods included in the **Unified Guidance**, but cannot yet do so for the Gamma 95% Upper Prediction Limit (Gamma 95% UPL) presented in the two Gibbons/Bhaumik technical papers referenced in the footnote to the table in Figure 3 of the ***Fix-It Manual***. The Gamma 95% UPL is a powerful Standard Status test method deserving consideration. So, until such time as ***Sanitas*** can make power curve analyses for this new method, it is reasonable to assume that it exhibits adequate statistical power (with no power curve) so long as the background sample size is at least eight, and a 95% confidence limit is used under a pass-1-of-3 retesting approach, with the reference concentration (CONCLIM) calculated using the approach described for “Table 4” of both these papers. [↑](#footnote-ref-1)
2. The addendum at the end of that appendix describes a helpful tool for conducting this test. [↑](#footnote-ref-2)
3. See Appendix 2 of the **Fix-It Manual**. [↑](#footnote-ref-3)
4. Note that a comparable allowance for a nonparametric method to test against the median of three new data points for each Reporting Period is not feasible because taking such an approach, during a given six-monthly Reporting Period, would preclude obtaining three new data points the following Reporting Period because the first new sample that could be taken for that pair (during that next Period) would be mid-Period, resulting in only two new data points. This precludes doing this sort of test because one needs at least three new data points to test their median value. [↑](#footnote-ref-4)
5. Clearly, the CONCLIM declared for a given pair in the Spreadsheet would not change in a case where the alternative background data set for the pair is updated but that pair is, at that point, using its MCL-or-ACL value as its Concentration Limit (GWPS). [↑](#footnote-ref-5)