



Open Range
S O F T W A R E

CTS User Manual

Industrial Hygiene

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Introduction

The CTS Industrial Hygiene (IH) program provides a user-friendly system to record, manage, and report information on industrial hygiene personal and area sampling data, hazard assessment data, and various program inventory data. Using this software correctly can help ensure your company will:

- Comply with federal, state, local, and internal exposure assessment requirements
- Identify and prioritize potential risks in the workplace as part of a comprehensive hazard assessment program

With IH, your organization will be able to save time and money by reducing sampling data discrepancies, and providing fast, easy, and secure access to industrial hygiene records.

Chapter 1 – What is Industrial Hygiene?

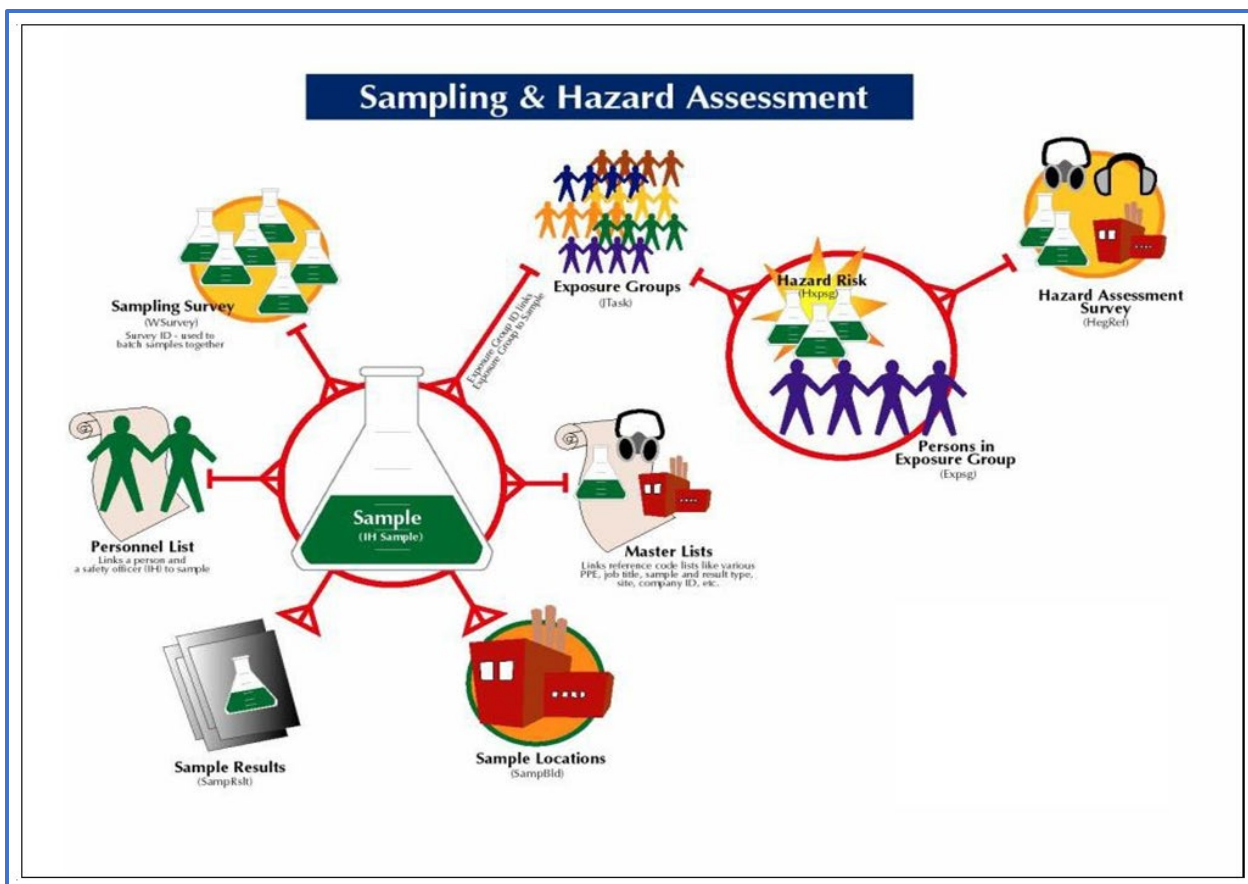
According to OSHA, industrial hygiene is defined as “that science and art devoted to the anticipation, recognition, evaluation, and control of those environmental factors or stresses arising in or from the workplace, which may cause sickness, impaired health and well-being, or significant discomfort among workers or among the citizens of the community”. (OSHA Office of Training and Education)

The CTS IH program harnesses the power to track these conditions and help eliminate or control them through appropriate measures.

Sampling and Hazard Assessment

Following standard survey protocol in conjunction with using other valuable CTS tools can provide a complete look at your company’s IH status.

Visual Concept for Sampling and Hazard Assessment



Sampling Types

The following table lists each of the core industrial hygiene sampling types supported by the CTS IH program. While each sampling type contains unique characteristics, they are all similar in appearance and function.

| Sampling Type | Typical Examples of Use |
|------------------------------|--|
| Area Air | Determine the effectiveness of engineering and/or administrative controls, evaluate the effectiveness of dilution ventilation, investigate bulk air contaminants, etc. |
| Area Biological | Document mold and bacteria counts. |
| Area Heat Stress | Direct reading WBGT data. |
| Area Noise | Direct reading noise data from a sound level meter. |
| Be-Facility Characterization | Typical use is for government and industry with many processes that involve the use of beryllium (historical and/or current). |

| | |
|---------------------------------|---|
| Be-Permanent/Fixed Air Sampling | Typical use is for government and industry with many processes that involve the use of beryllium (historical and/or current). |
| Be-Routine Wipe Sampling | Typical use is for government and industry with many processes that involve the use of beryllium (historical and/or current). |
| Bulk Sampling | Sample insulation on paint. |
| Direct Reading | Confined space entry O2LEL checks, colorimetric tubes, and other direct reading instruments not already handled by other sampling types. This sample type is used when no other sample type represents your direct reading sample. |
| EMF Monitoring | Direct reading electromagnetic field monitoring data. |
| Hood Surveys | Ventilation hood surveys. |
| Light Monitoring | Document workplace lighting conditions. |
| Personal Air | Quantify and qualify employee exposure to airborne contaminants, demonstrate compliance with applicable federal, state, and local regulations, and predict the health effects of exposure by comparing the sampling results with occupational health exposure standards (e.g., PELs, TLVs, etc.). |
| Personal Biological | Blood-Lead, Arsenic-Urine, Mercury-Urine, and other personal biological analyses. |
| Personal Noise | Direct reading personal noise monitoring data. |
| Water Sampling | Document Potable and Non-Potable water samples. |
| Wipe Sampling | Document where and when you take wipe samples for surface contamination review or control. |

Determining your Business Rules

Part of implementing any enterprise system for information management is determining your company specific guidelines and business rules around the sampling process. This task is very important to the field of Industrial Hygiene due to the extensive variability of sample methods and types as well as the generic nature of many requirements.

Below is a series of business rules you may want to consider for your organization. This list is intended only as a guideline.

Records Management Business Rule

Entry of data into CTS does not eliminate the need to maintain field notes or lab result sheets that are considered part of the sampling record. An alternative to maintaining hard copy data of this nature at your site is to scan these records as part of a CTS Sampling Survey.

Items that might be considered part of the 'record copy' sampling record include field sampling data collection forms that contain data not captured in CTS, signed employee notification reports, and lab result reports that describe the analytical methods and procedures used.

Any documentation that affects how a sample should be treated and that is not kept directly as part of the CTS sampling record.

Listed below for your review are some examples of business rules that may apply to your company for select data fields in the Industrial Hygiene Sampling and Hazard Assessment program.

Example Business Rules for IH Sampling Fields

Each personal sample must always be linked to an Exposure Group, Job Title, and Location Type unless a sample is not representative of potential exposures.

The following fields are required for each sample, even though the software does not require entry before leaving the sample form. Sample ID, Job Title, Monitored Agent and Result, Exposure Group, and Location type.

Assigning a **sample number** (CTS SAMPLE ID field) - For consistency of searching, queries, and data evaluation the following business rule must be used for assigning the Sample ID. The eleven (11) characters in this field are to be used as follows:

- | | |
|-------|--|
| 1 | Business Unit code |
| 2-3 | Numeric designation for the month the sample was taken (01-12) |
| 4-5 | Date in the month the sample was taken (01-31) |
| 6-7 | Year the sample was taken (00-99) |
| 8-9 | First and last initial of the person collecting the sample |
| 10-11 | Sequence number of this sample collected this day (01-99) |

Contract employees should be entered, if possible, as within the specific Business Unit (site) employee list, however, the word "contract employee" should appear in the Organization field with the name of the company in the Comments field.

Voided samples: Samples that are voided for one of the reasons below are to be indicated by typing "VOID" in the TWA Result field. Currently the Units field will also have to be populated.

Samples that are voided for one of the reasons below are to be indicated by typing "VOID" in the TWA Result field. The reason for voiding a sample should be entered in the Comments field in the 'Sample' tab.

- If a pre and post calibration on a sampling pump is not performed
- If the sampling drop pre to post calibration is greater than 20%
- If pump or noise dosimeter fails during sampling
- If the breakthrough between the front and back section is greater than 25%
- If an OVM membrane is ripped, significantly soiled, splashed with liquids
- If tampering is witnessed or confirmed
- If result is atypical and does not have a reasonable explanation
- Analytical problems due to wrong methodology, extremely long shipment time, or filter overloading

| |
|--|
| <p>The work location for transient employees should reflect a particular facility or unit whenever possible.</p> |
| <p>Sample Type Selection - Most of the sample type selections are self-explanatory apart from DIRECT READING. This should be used only as a second option when the data doesn't match another 'sampling type' and only when using direct reading instruments such as colorimetric tubes and other direct read instruments. For example, direct reading noise data from a Sound Level Meter must be entered as AREA NOISE; direct reading WBGT data should be entered as HEAT STRESS. BULK SAMPLING should be used only when sampling such items as insulation on paint.</p> |
| <p>The Survey ID is a generic but unique ID that helps batch samples together for consistency of searching, queries, and data evaluation. This section can be used to link common aspects from a group of samples that may make up one sampling 'survey'. The only design requirement of the ID in this field is that it be unique across the database. Pressing the icon next to the field can automatically generate the Survey ID assigning the value SID-1, SID-2, SID-3, etc. However, it is recommended that each Business Unit use the format outlined for the SAMPLE ID by beginning the Survey ID with the Business Unit Code, followed by the numeric designation for month of the survey (01-12), the day of the survey, the year of the survey, the initials of the survey person, and the sequence for the survey performed on this day as shown below.</p> <p>1 Business Unit code</p> <p>2-3 Numeric designation for month of sample (01-12) 4-5 Date of sample (01-31)</p> <p>6-7 Year of sample (00-99)</p> <p>8-9 Initials of person collecting sample</p> <p>10-11 Sequence number of this sample collected this day (01-99)</p> |
| <p>For the sample result type, enter one of the selections based on which exposure limit the result is to be compared with (i.e., if for a 30-minute asbestos sample use "Excursion", for a 15-minute benzene sample use "STEL"). This decision is critical since it determines how the actual sample result will be adjusted to determine the final calculated sample result. If less than 80% of the full shift was sampled (i.e., 7 hrs. for an 8-hr shift, 10 hrs. for a 12-hr. shift), select Task sample and the final calculated result (TWA Result) will not be adjusted from the sample result concentration. NOTE: The 8,10,12 hr. TWA selections adjust for the unsampled time when calculating the final exposure results.</p> |

Employee names, IDs and SSN will be pre-loaded and can be selected from this pick list. However, employees or contractors and their SSN numbers will not be pre-loaded. This is a pick list that is specific to each Business Unit. That is a user will not have access to employees from other business units unless they are given this permission. Employees/contractors who were sampled can only be selected or entered here. **Note:** Do not confuse the employee sampled with the supervisor and safety officer information from the 'employee tab' in 'sample add' window.

Contractors should be entered just as company employees by entering their SSN and other information. The Company ID and Site ID for the location where contractor is working should be used. Also, all contract employees should have the word 'contract employee' entered in the organization category field from the 'employee' tab. Then, the company name must be added into the comments field or a specific Organization ID assigned to the contractor across the corporation.

SURVEY TITLE: Should be standardized for each Business Unit to allow surveys to be categorized together. Consider starting with the Facility (unit or location) abbreviation or name, an abbreviation if the sample type such as PA for personal air, and possibly the initials of the sample person. As much description as you can give in this 65-character field the better. This is a 'quick look' brief description field to help find a sampling survey from a list.

SURVEY DATE: Typically, this is the same as the sample date, but if you have a survey that crosses multiple days use first day sample was collected.

Example Business Rules for Sampling Fields - continued

For sampled shift the following should be used:

- O Other
- G Graveyard (8, 10 or 12 hour)
- D Day (8, 10 or 12 hour)
- E Evening (8 hour)

Totaled sampled time versus Estimated Exposure Time: To be consistent and somewhat conservative, if the sample was collected for at least 80% of the full shift (i.e., 7 hrs. for an 8-hr shift, 10 hrs. for a 12-hr shift) and the exposure during the sample period is the same for the complete shift, follow these steps:

If the sample period is less than the full shift, enter the "full shift" time in the field called Estimated Exposure time. This means that the exposure over the sample period will be automatically assigned to the full shift. The Estimated Exposure time field can also be viewed from the **TWA Manger** button in the 'Results' Tab.

If the sample period is longer than the full shift, enter the "actual sample" time in the field called Estimated Exposure time. Again, this means that the actual exposure over the sample period (concen) will automatically be assigned to the full shift result (TWA result).

The actual exposure over the sampled period is called Concen (concentration). The calculated TWA result is calculated using variables of the actual sample period, the TWA shift selected, and the data entered in the estimated exposure time field.

TWA Manager button: This button is used to calculate a TWA if there are multiple samples on the same person for the same agent on the same day or if you want to calculate Upper and Lower confidence limits for the sample. If you perform a full shift sample the TWA will be calculated during the Add Agent process. If you have multiple samples for one person on the same day, you will not see the TWA result field in the Add Agent screen. You must go through the **TWA Manager** button.

Exposure Group ID & Sub ID: This tab is used to link the specific sample to an Exposure Group. Since this is a Site list, creation of Exposure groups will be left up to a Site or Business Unit, however each exposure group name **MUST** be preceded with the Business Units Site code to allow for multiple sites to use the same exposure group name. CTS requires that all exposure group names be unique across sites, even though this is a Site list. By adding the Site prefix to the beginning of your exposure groups this will support this requirement.

Routine Equipment/Machine ID: This field is to be used for entering major pieces of equipment. Since this is a Site list, creation of the Routine equipment ID will be left up to a Site or Business Unit, however each ID **MUST** be preceded with the Business Units Site code to allow for multiple sites to use the same ID. CTS require that all Routine equipment IDs be unique across sites, even though this is a Site list. By adding the Site prefix to the beginning of your exposure groups this will support this requirement.

Facility: This field is used to designate the specific location, processing unit, or the specific facility location where the sample was taken. The focus on this field should be on the actual location, not arbitrary administrative groupings that may change over time. Therefore, emphasis is placed on the individual facility or processing unit rather than a region or group of units that may be managed by one supervisor. Each Site or Business unit will create their own facility names; however, the Site or Business Unit code must precede the facility name used. CTS requires that all facility names be unique across sites, even though this is a Site list. By adding the BU's Site prefix to the beginning of your exposure groups this will support this need.

Example Business Rules for Sampling Fields - continued

OPERATIONAL STATUS CODE: The following options are available in this Corporate list. Additional options may appear in the field from historical data but will not be available for new samples.

| | |
|-----|-----------------------------------|
| NOR | Normal operation of unit/facility |
| SD | Shutting down of unit/facility |
| SU | Startup of unit/facility |
| US | Upset, spill or leak |

Personal Protective Equipment (PPE) - The basic assumption for completing this section of the record is to record all PPE that might influence the level of exposure received by a person as compared to the quantitative measurement picked up by the sample. Keep PPE item descriptions to 25 characters or less.

Reference Lists

There are many types of data used in validation reference lists associated with Industrial Hygiene data. The consistency of these lists is critical to your ability to pull data out for trending and review. Below are some examples of data for several such lists. Once your company has agreed on the items for a reference list you can add them into the Master Code Table to ensure they are always input correctly.

Task Category

| TASK CATEGORY | |
|---------------|-------------------------------------|
| Code | Description |
| AB | Abrasive Blasting |
| ASB | Asbestos Insulation Job |
| CS | Confined Space Work |
| ER | Emergency Response / Spill Clean-Up |
| FC | Filling Containers / Drums / Pails |
| FW | Foundry Worker |
| GT | Gauging Storage Tank |
| HS | Health And Safety Support |
| LSB | Loading Ship Or Barge |
| P | Painting |
| PIG | Pigging Pipeline / Product Line |
| QC | Quality Control Sampling |
| ROU | Routine Operations |
| SA | Sample Analysis |
| VENT | Steaming, Venting Or Draining |
| INSP | Tank / Equipment Inspection |
| USB | Unloading Ship Or Barge |
| UTC | Unloading Tank Car |
| UT | Unloading Tank Trailer |
| W | Welding |

PPE

| PPE - EYE / FACE | |
|------------------|-------------------------|
| Code | Description |
| F | Face Shield |
| G | Goggles |
| GF | Goggles and Face Shield |
| IR | Infrared Shield |
| SG | Safety Glasses |
| WG | Welding Goggles |
| WH | Welding Hood |
| NW | Not Worn |

| PPE - CLOTHING / BODY | |
|-----------------------|-----------------------|
| Code | Description |
| AC | Anti-C Coveralls |
| BG | Bunker Gear |
| BS | Body Suit |
| CD | Coveralls, Disposable |
| CCH | Coveralls, Chemical |
| CC | Company Clothing |
| CO | Coveralls |

| | |
|------|------------------------|
| DLC | Disposable Lab Coat |
| LC | Lab Coat |
| SS | Slicker Suit |
| SC | Slicker Suit, Chemical |
| FBC | Full Body, Chemical |
| FBAL | Full Body, Aluminized |
| NW | Not Worn |

PPE – HEARING

| Code | Description |
|-------|---------------------|
| EP | Ear Plugs |
| EPO | Ear Plugs, Other |
| EPWM | Ear Plugs and Muffs |
| EPF | Ear Plugs, Foam |
| MUFFS | Muffs |
| NW | Not Worn |

PPE-HAND/ARM

| Code | Description |
|------|------------------------|
| VIB | Anti-Vibration Gloves |
| BG | Butyl Gloves |
| COT | Cotton Gloves |
| CL | Cotton Liners |
| HOT | Hot Gloves, Electrical |
| LEG | Leather Gloves |
| NP | Neoprene Gloves |
| NPVC | Nitrile Coated PVC |
| NG | Nitrile Gloves |
| PVA | Polyvinyl Alcohol |
| PVC | Polyvinyl Chloride |
| SIL | Silver Shields |
| VIT | Viton Gloves |
| WG | Welders Gloves |
| NW | Not Worn |

PPE-RESPIRATORY PROTECTION

| Code | Description |
|------|-------------------------|
| SCBA | SCBA |
| GM | Gas Mask (Blocked Out) |
| SARF | Supplied-Air, Full Face |
| SARH | Supplied-Air, Half Mask |
| SAH | Supplied-Air Hood |
| SARE | Supplied-Air W/ Egress |
| FF | Full Face-APR |
| HF | Half Face-APR |
| PARF | Particulate Filter |
| PAPR | Powered Air Purifying |

| | |
|----|----------|
| NW | Not Worn |
|----|----------|

| PPE-RESPIRATORY CARTRIDGE | |
|---------------------------|-------------------------|
| Code | Description |
| C | Chemical Cartridge |
| H | HEPA Cartridge |
| PART | Particulate Cartridge |
| O | Organic Vapor Cartridge |
| COMBO | Combination Cartridge |
| NW | Not Worn |

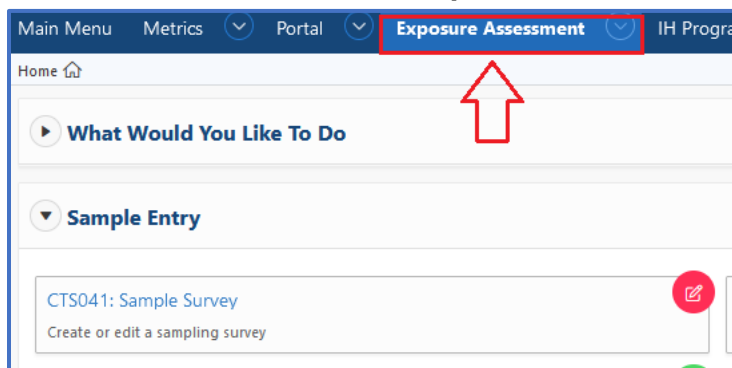
Chapter 2 – Sampling Surveys

The sample survey is typically a collection of one or more samples represented by a one day, or few days’ project. This can be thought of as a set of samples representing a chain-of-custody. The sample survey is intended to be opened, performed, peer reviewed, and locked within a fairly short period of time. If there is a need to associate a long-term project, use the project/study field.

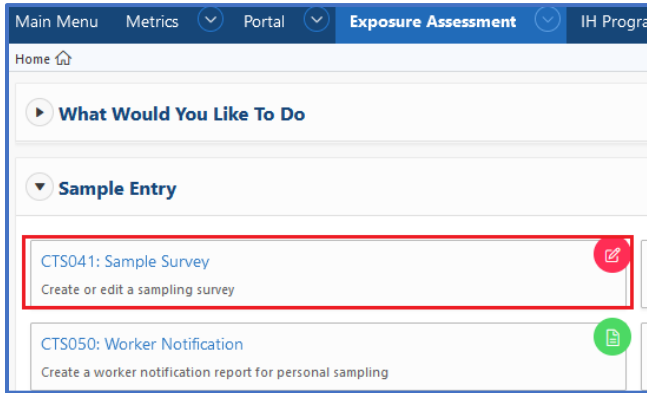
CTS041: Sample Survey

Create New Survey

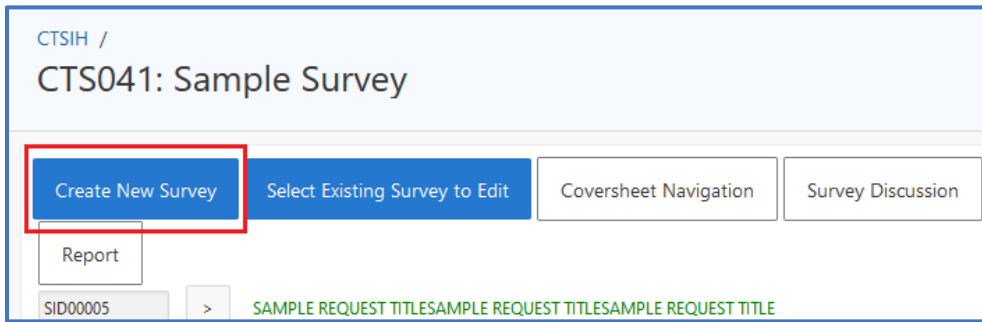
From CTS Main Menu, click **Exposure Assessment** button.



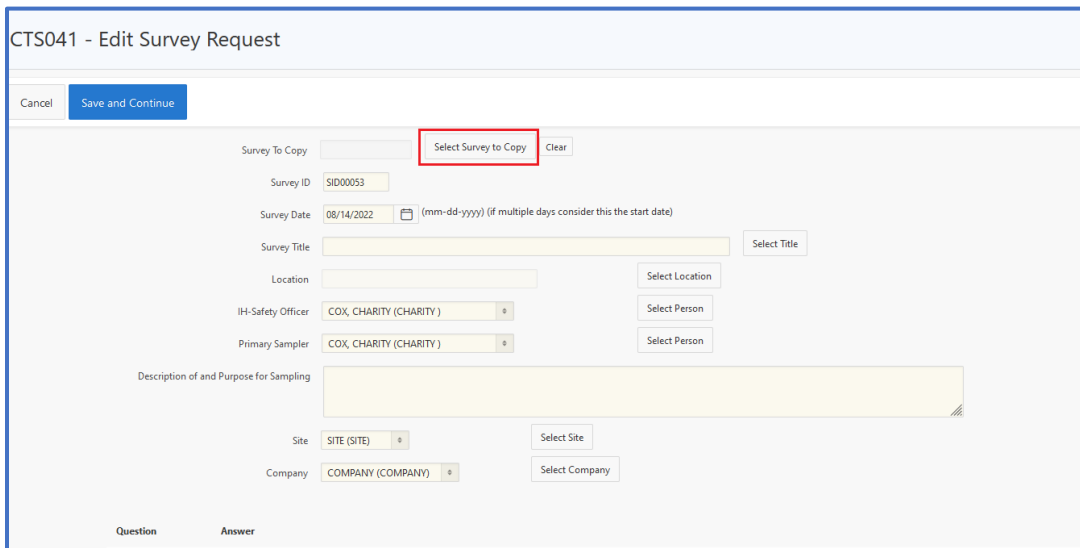
Click **CTS041: Sample Survey** button.



Click **Create New Survey** button.



To save time, a survey can be copied by clicking **Select Survey to Copy** button.



Use pulldown menu to toggle between **All Surveys** and **Open Surveys**. Then, click purple **Select Survey to Copy** text. Fields will be auto populated.

| | Survey ID | Sample Date | Status | # Samples | Title | Location | Type | Sample Plan | IH-Safety Officer | Primary Sampler | Flagged For Peer Review | Site | Company |
|-----------------------|-----------|-------------|--------|-----------|--------------------------------------|--------------------------|------|-------------|-------------------|-----------------|-------------------------|------|---------|
| Select Survey to Copy | SID00031 | 05/25/2022 | OPEN | 8 | FFFF | AREA 1 BUILDING 1 ROOM 1 | - | - | SYSTEM,I | SYSTEM,I | Yes | SITE | COMPANY |
| Select Survey to Copy | SID00033 | 05/25/2022 | OPEN | 1 | RTYU | AREA 1 BUILDING 1 ROOM 2 | - | - | SYSTEM,I | SYSTEM,I | | SITE | COMPANY |
| Select Survey to Copy | SID00030 | 05/24/2022 | OPEN | 1 | TTT | AREA 1 BUILDING 1 ROOM 3 | - | - | SYSTEM,I | SYSTEM,I | | SITE | COMPANY |
| Select Survey to Copy | SID00013 | 04/15/2022 | OPEN | 15 | TEST2 | AREA 1 BUILDING 1 ROOM 1 | - | - | SYSTEM,I | SYSTEM,I | Yes | SITE | COMPANY |
| Select Survey to Copy | SID00016 | 04/15/2022 | OPEN | 11 | SITE AREA 1 SYSTEM,INITIAL (ITBADGE) | AREA 1 | - | - | SYSTEM,I | SYSTEM,I | | SITE | COMPANY |

Alternatively, create a new survey from scratch. Click **Create New Survey** button. Verify *Survey ID, Survey Date, IH-Safety Officer, Primary Sampler, Site, and Company* are auto populated. Choose a *Survey Date* using the calendar button.

Click **Select Title** button.

CTS041 - Edit Survey Request

Cancel Save and Continue

Survey To Copy: Select Survey to Copy Clear

Survey ID: SID00053

Survey Date: 08/14/2022 mm-dd-yyyy (if multiple days consider this the start date)

Survey Title: **Select Title**

Location: Select Location

IH-Safety Officer: COX, CHARITY (CHARITY) Select Person

Primary Sampler: COX, CHARITY (CHARITY) Select Person

Description of and Purpose for Sampling:

Site: SITE (SITE) Select Site

Company: COMPANY (COMPANY) Select Company

Click blue **Select** text to choose a title.

New Item

Search: Go

Rows: 100 Actions

1 - 1 of 1

| | Survey Title |
|---------------|---------------|
| Select | TITLE EXAMPLE |

1 - 1 of 1

Click **Select Location** button.

Survey Title: TITLE EXAMPLE [Select Title]

Location: [Select Location]

IH-Safety Officer: COX, CHARITY (CHARITY) [Select Person]

Click blue **Select** text to choose a location.

| | Location ↑ | Loc-2 | Loc-3 | Location Name | Location Category | Code | Site | Company |
|--------|------------|------------|--------|---------------|-------------------|---------|------|---------|
| Select | AREA 1 | - | - | - | OFFICE AREA | F000004 | SITE | COMPANY |
| Select | AREA 1 | BUILDING 1 | - | - | OFFICE AREA | F000003 | SITE | COMPANY |
| Select | AREA 1 | BUILDING 1 | ROOM 1 | - | OFFICE AREA | F000002 | SITE | COMPANY |
| Select | AREA 1 | BUILDING 1 | ROOM 2 | - | OFFICE AREA | F000005 | SITE | COMPANY |
| Select | AREA 1 | BUILDING 1 | ROOM 3 | - | OFFICE AREA | F000006 | SITE | COMPANY |

Use pulldown menus to select *IH-Safety Officer*, *Primary Sampler*, *Site*, and *Company* options.

Enter text into *Description of and Purpose for Sampling* textbox.

IH-Safety Officer: COX, CHARITY (CHARITY) [Select Person]

Primary Sampler: COX, CHARITY (CHARITY) [Select Person]

Description of and Purpose for Sampling: [Text Area]

Site: SITE (SITE) [Select Site]

Company: COMPANY (COMPANY) [Select Company]

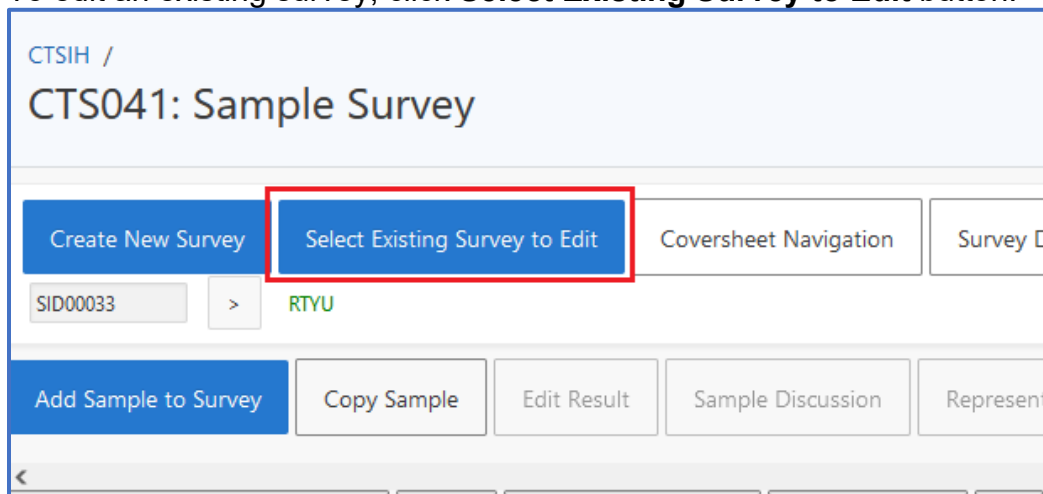
Click **Save and Continue** button.

| Field | Description |
|---------------------|-------------------------------------|
| <i>Survey ID</i> | Auto assigned identification number |
| <i>Survey Date</i> | Date of sample survey |
| <i>Survey Title</i> | Title of sample survey |
| <i>Location</i> | Location of sample survey |

| | |
|---|--|
| <i>IH-Safety Officer</i> | Officer assigned to sample survey |
| <i>Primary Sampler</i> | Sampler assigned to sample survey |
| <i>Description/Purpose for Sampling</i> | Notes about sampling |
| <i>Site</i> | Site where sample survey is created |
| <i>Company</i> | Company where sample survey is created |

Edit Existing Survey

To edit an existing survey, click **Select Existing Survey to Edit** button.



Use pulldown menu to toggle between *All Surveys*, *Locked Surveys*, and *Open Surveys*. Click blue **Select** text to choose a survey to edit.

Open Surveys

1 - 50 of 250

| | Sample Date | Survey ID | Plan Type | Sample Plan | Title | Assessment Type | Location | Loc-2 | IH-Safety Officer | Primary Sampler | Flagged for Peer Review | Status | Total # Samples | Attachments | Site |
|--------|-------------|-----------|-----------|-------------|--------------------------------------|-----------------|----------|------------|-------------------|-----------------|-------------------------|--------|-----------------|-------------|------|
| Select | 25-MAY-2022 | SID00031 | - | - | FFFF | MULTIPLE TYPES | AREA 1 | BUILDING 1 | SYSTEM | SYSTEM | Yes | OPEN | 8 | 1 | SITE |
| Select | 25-MAY-2022 | SID00033 | - | - | RIVU | PERSONAL NOISE | AREA 1 | BUILDING 1 | SYSTEM | SYSTEM | | OPEN | 1 | - | SITE |
| Select | 24-MAY-2022 | SID00030 | - | - | TTT | PERSONAL NOISE | AREA 1 | BUILDING 1 | SYSTEM | SYSTEM | | OPEN | 1 | - | SITE |
| Select | 15-APR-2022 | SID00013 | - | - | TEST2 | MULTIPLE TYPES | AREA 1 | BUILDING 1 | SYSTEM | SYSTEM | Yes | OPEN | 15 | - | SITE |
| Select | 15-APR-2022 | SID00016 | - | - | SITE AREA 1 SYSTEM,INITIAL (TBADIGE) | WIPE SAMPLING | AREA 1 | - | SYSTEM | SYSTEM | | OPEN | 11 | - | SITE |

Click **Edit Keys** button to edit survey details.

CTSIH / CTS041: Sample Survey

SID00005 > SAMPLE REQUEST TITLESAMPLE REQUEST TITLESAMPLE REQUEST TITLE

Buttons: Create New Survey, Select Existing Survey to Edit, Coversheet Navigation, Survey Discussion, Notify, Blank-Control, Survey Attachments, Flag Peer Review, Survey Tracking, **Edit Keys**, Report, Delete Survey

Buttons: Add Sample to Survey, Copy Sample, Edit Result, Sample Discussion, Represented Workers, Note, Sample Attachments, Upload Sample, Upload Result, Edit Keys, Delete Checked

Edit survey information. Click **Save and Continue** button.

Edit Sample Survey

Buttons: Cancel, **Save and Continue**

Sample Plan: 0000003 [Select Sample Plan Template] [Clear]

Survey ID: SID00005

Survey Date: 03/21/2022 (mm-dd-yyyy) (if multiple days consider this the start date)

Check to update date into ALL samples associated with this survey (caution-not automatically reversible)

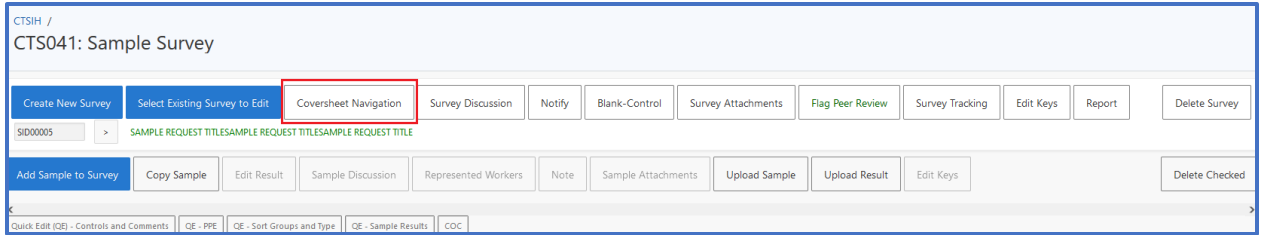
Survey Title: SAMPLE REQUEST TITLESAMPLE REQUEST TITLESAMPLE REQUEST TITLE [Select Title]

Location: AREA 1 [Select Location]

BUILDING 1

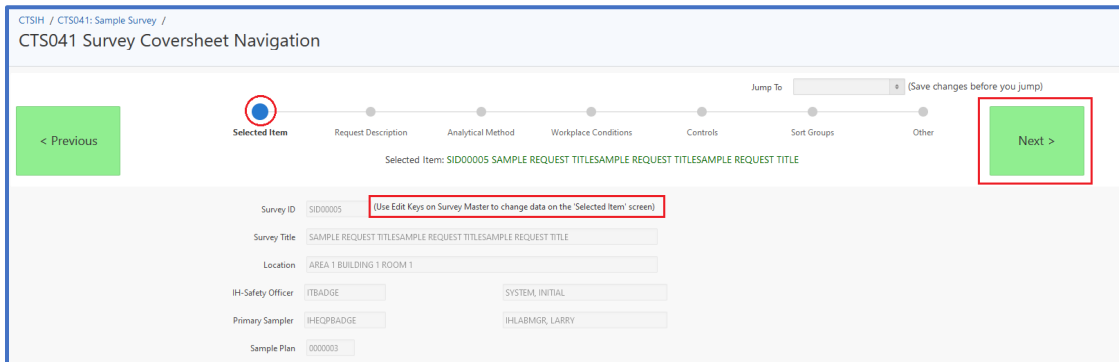
Coversheet Navigation

Select an existing survey to edit. Click **Coversheet Navigation Detail** button.



Note: To change data displayed on *Selected Item* screen, use **Edit Keys** button on main **CTS041: Sample Survey** screen.

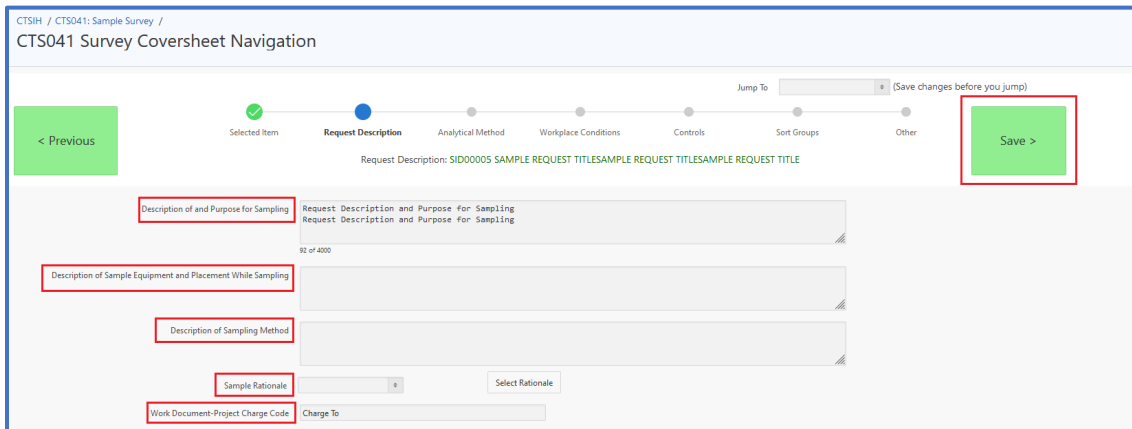
Click **Next** button.



Enter text into *Description...* and *Work Document-Project Charge Code* textboxes.

Use pulldown menu to select *Sample Rationale*.

Click **Save** button.



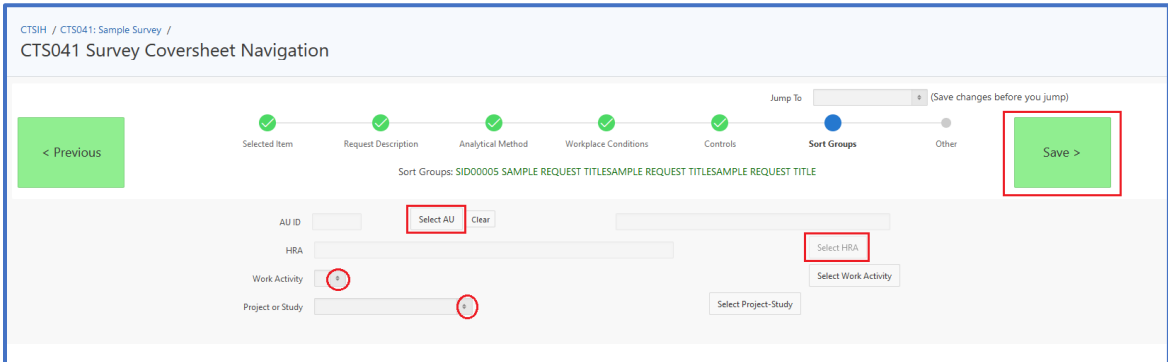
Use pulldown menus to select *Sampling Media-Device*, *Sampling Method*, *Lab to Analyze Samples*, and *Requested Turn-Around-Time* options.

Click **Save** button.

Enter text into Description textboxes. Click checkboxes to select location and condition options. Click **Save** button.

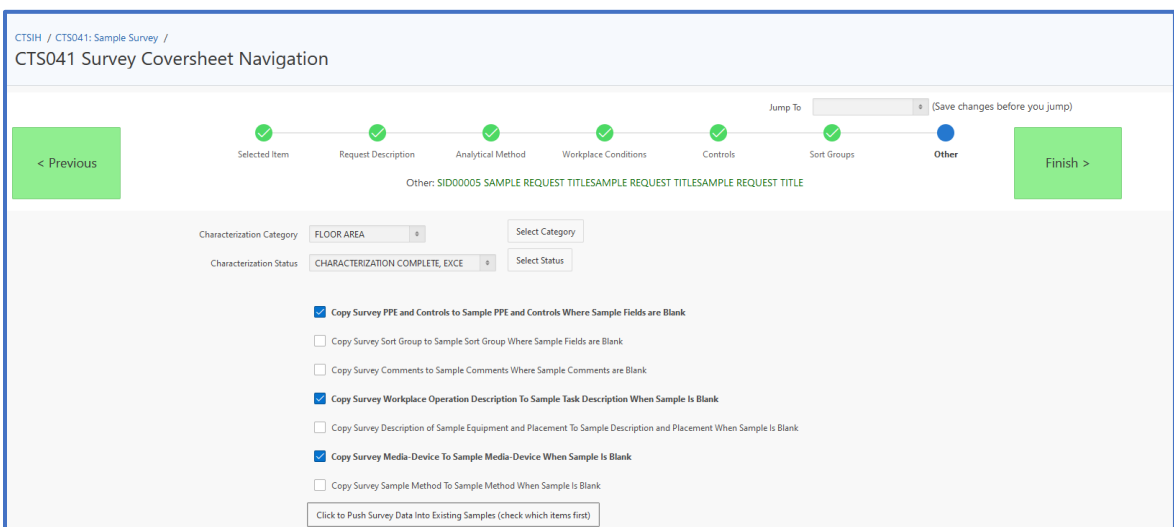
Enter text into Description textboxes. Click checkboxes to select location and condition options. Click **Save** button.

Click **Select AU** button to select Assessment Unit.
 Click **Select HRA** to select Hazard Risk Assessment.
 Use pulldown menus to select *Work Activity* and *Project or Study* options.
 Click **Save** button.



Use pulldown menus to select *Characterization Category* and *Characterization Status*.
 Click checkbox(es) to select copy options.
 Click the **Click to Push Survey Data Into Existing Samples (check which items first)** button.

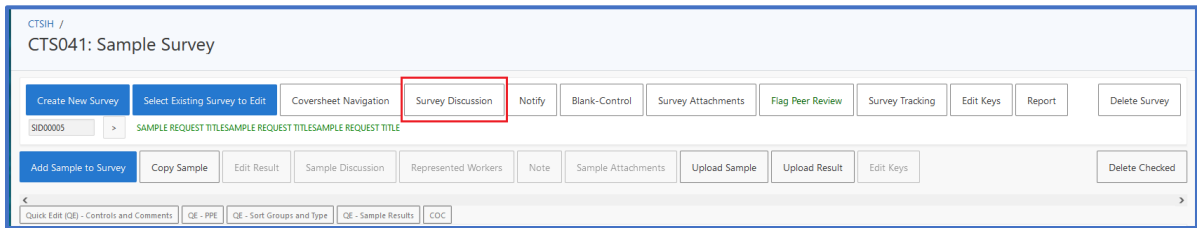
Click **Finish** button.



Survey Discussion

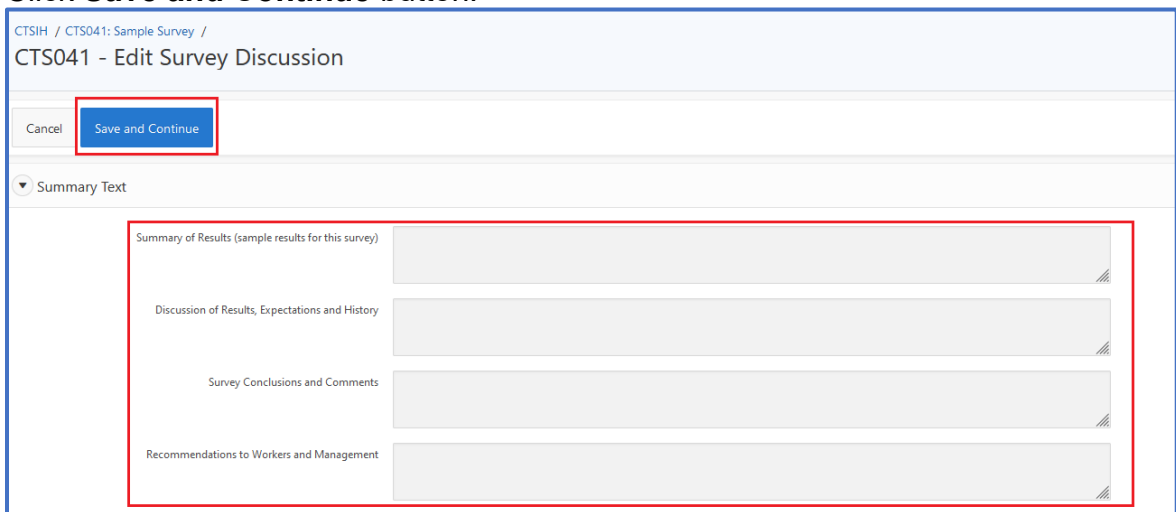
Select an existing survey to edit.

Click **Survey Discussion** button.



Enter text into textboxes under *Summary Text* submenu.

Click **Save and Continue** button.



At the bottom of the survey discussion screen click on the **Create Recommendation or Action to Track** button. Enter details on *Sample Survey Action Tracking Detail* screen.

Click **Save and Continue** button.

CTSIH / CTS041: Sample Survey / CTS041 - Edit Survey Discussion /
Sample Survey Action Tracking Detail

Cancel Save and Continue

Action Item Title

Description of Action

Line Manager or Requester > Select Person

Person to Complete the Action > Select Person

IH-Safety Contact IHLABMGR, LARRY (IHEQPBADGE) Select Person

Target Date 11/13/2022 (mm/dd/yyyy)

Date Completed

Completion Statement

Action is logged below Track button. Note each action has a **Track ID** hotlink.

Create Recommendation or Action to Track Edit Action

1 - 1 of 1

| <input type="checkbox"/> | Edit Action | Track ID | Target Date | Recommendation Description | Date Completed | Closed Comment | Line Manager or Requestor | Person to Complete The Action | IH-Safety Contact |
|-------------------------------------|-------------|----------|-------------|----------------------------|----------------|----------------|----------------------------|-------------------------------|-----------------------------|
| <input checked="" type="checkbox"/> | | 0000008 | 13-NOV-2022 | TESTING | - | - | GRINER,CARLEENA (CARLEENA) | COX,CHARITY (CHARITY) | IHLABMGR,LARRY (IHEQPBADGE) |

1 - 1 of 1

Clicking this link displays a **Safety and Health Action Item Report** specific to this action (displayed in a new browser tab).

Safety and Health Action Item Report

Title: FOLLOW UP EXAMPLE

Description: TESTING

Sampling Survey: SID00005 SAMPLE REQUEST TITLESAMPLE REQUEST TITLESAMPLE REQUEST TITLE

Target/follow-up date: 13-NOV-2022

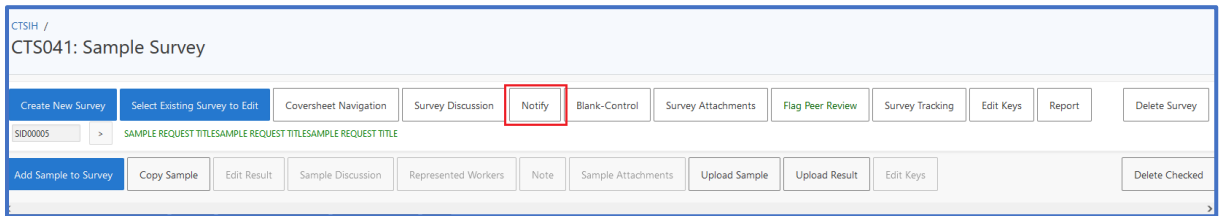
Person to Complete the Action: COX, CHARITY (CHARITY)

Line Manager or Requestor: GRINER, CARLEENA (CARLEENA)

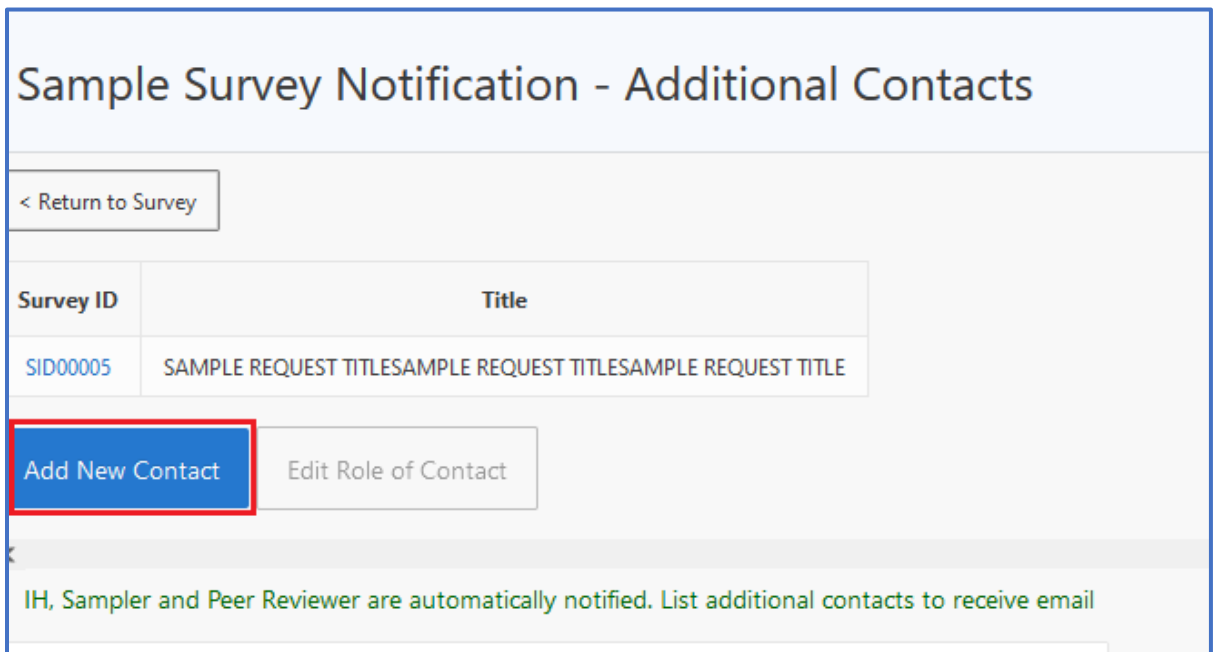
IH-Safety Contact: IHLABMGR, LARRY (IHEQPBADGE)

Notify List

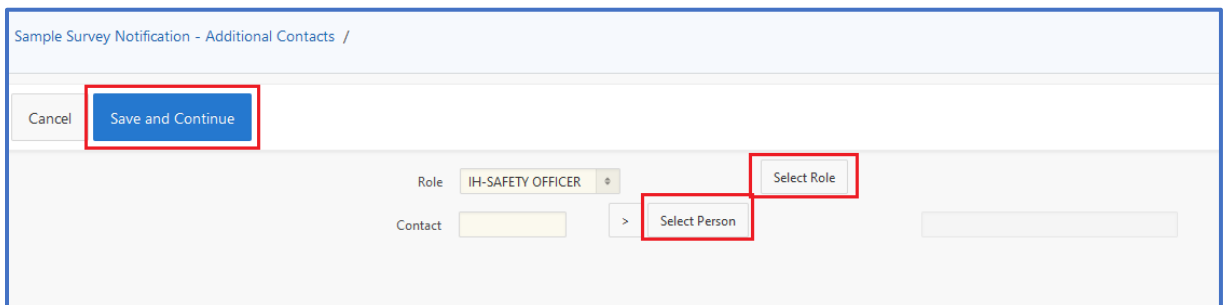
Select an existing survey. Click **Notify** button.



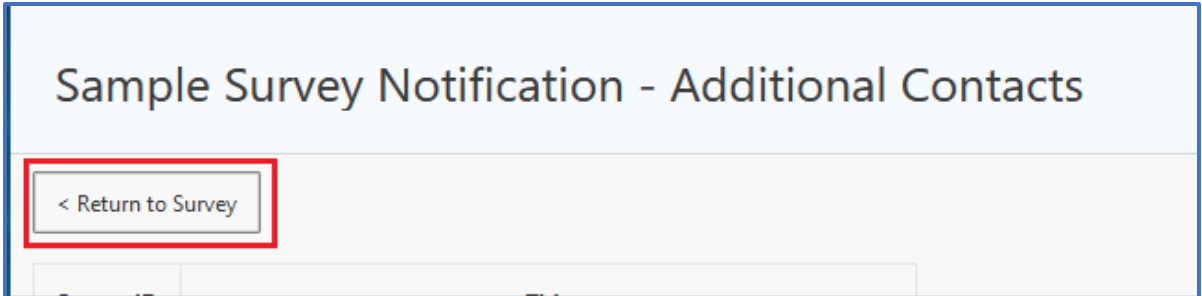
Click **Add New Contact** button.



Enter *Role* and *Contact* options using **Select Role** and **Select Person** buttons. Click **Save and Continue** button.

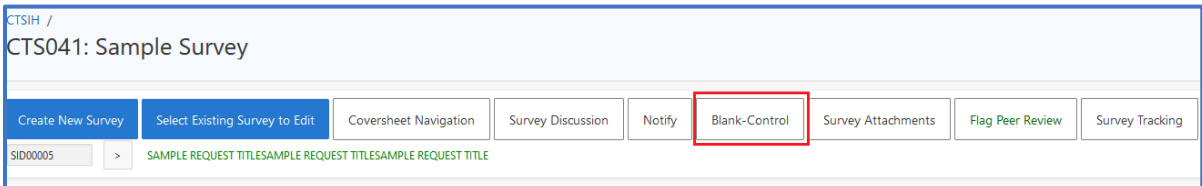


When finished adding contacts, click **< Return to Survey** button.

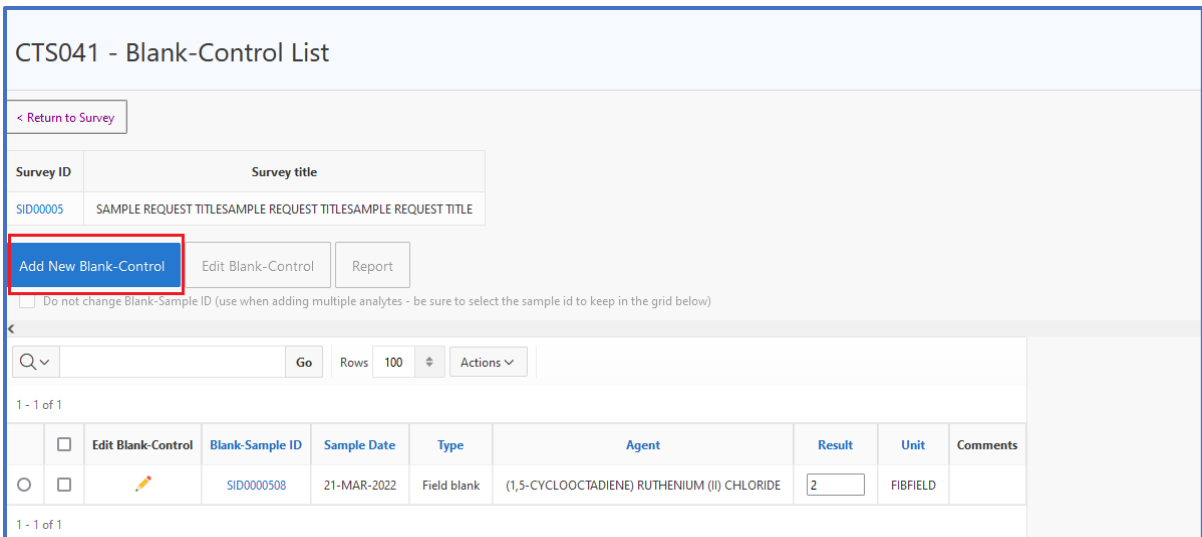


Blank Control

Select an existing survey. Click **Blank-Control** button.



Click **Add New Blank-Control** button.



Use calendar button to select *Sample Date*. Use pulldown menus to select *Blank Type, Agent, and Unit* options. Enter text into *Lab Result* text box.


Enter *Comments* in text area.


Click **Save and Continue** button.

CTS041 - Blank-Control List /
 CTS041 - Blank-Control Detail

Cancel **Save and Continue**


Blank-Sample ID: SID0000509

Sample Date: 03/21/2022  For single date surveys this is the same as the survey date. For multi-date surveys choose the date the field blank was used with real samples)

Blank Type: Field blank 

Agent-Analyte: **Select Agent**

Lab Result (raw value)

Unit: 

Comments

Click **< Return to Survey** button.

CTS041 - Blank-Control List

< Return to Survey

Survey Attachments

Click **Survey Attachments** button.

CTSIH /
 CTS041: Sample Survey

Create New Survey Select Existing Survey to Edit Coversheet Navigation Survey Discussion Notify Blank-Control **Survey Attachments** Flag Peer Review Survey Tracking

SID00005 > SAMPLE REQUEST TITLESAMPLE REQUEST TITLESAMPLE REQUEST TITLE

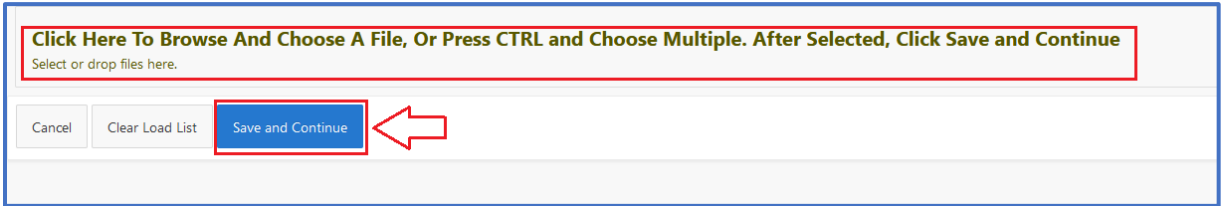
Click **Add Attachment** button.

CTSIH / CTS041: Sample Survey /
 CTS041 Survey Attachments

| Survey ID | Survey title | Primary Sampler | IH/Safety Officer |
|-----------|--|-----------------|-------------------|
| SID00005 | SAMPLE REQUEST TITLESAMPLE REQUEST TITLESAMPLE REQUEST TITLE | IHLABMGR | SYSTEM |

Add Attachment Edit Description

Click to browse local machine for a file to upload or drag and drop.
Click **Save and Continue** button.

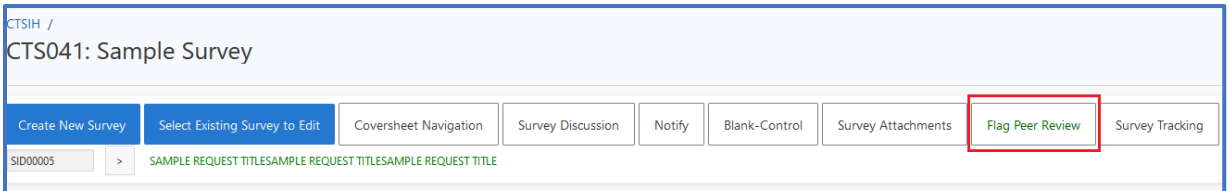


Click **CTS041: Sample Survey** / breadcrumb to return to main survey screen.



Flag Peer Review

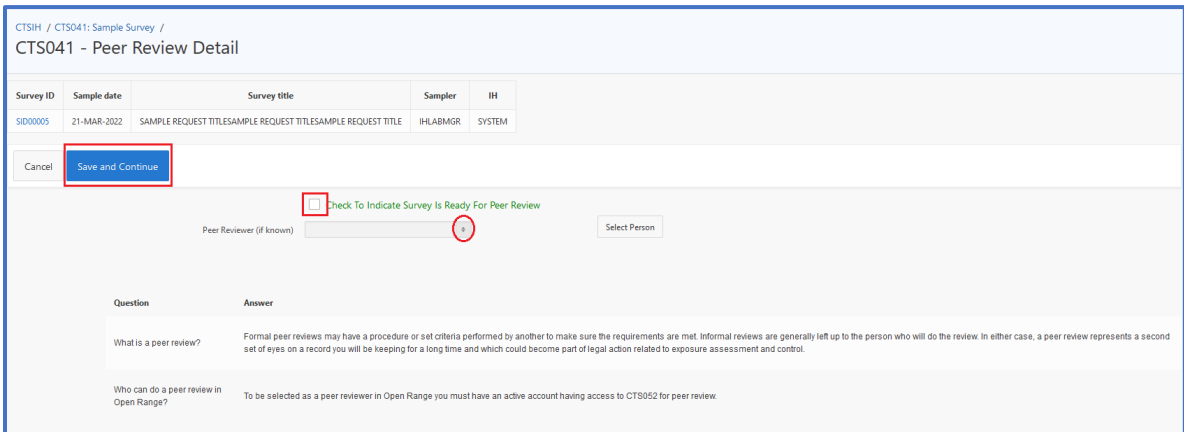
Click **Flag Peer Review** button.



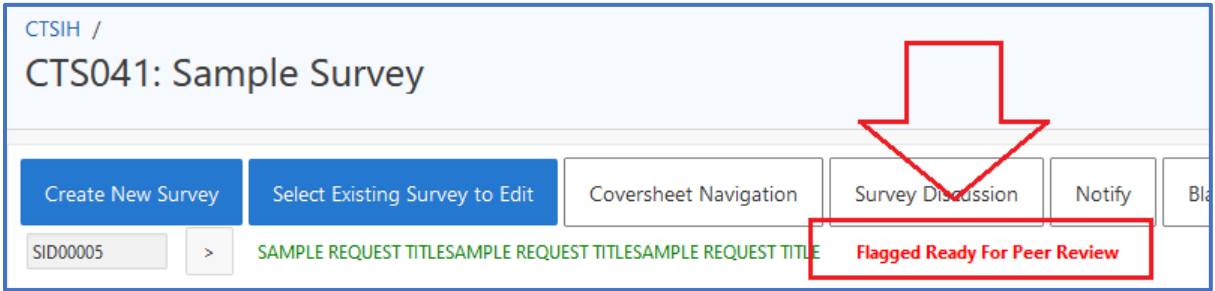
Click the checkbox to the left of *Check To Indicate Survey Is Ready For Peer Review* text.

Use pulldown menu to select *Peer Reviewer (if known)*.

Click **Save and Continue** button.

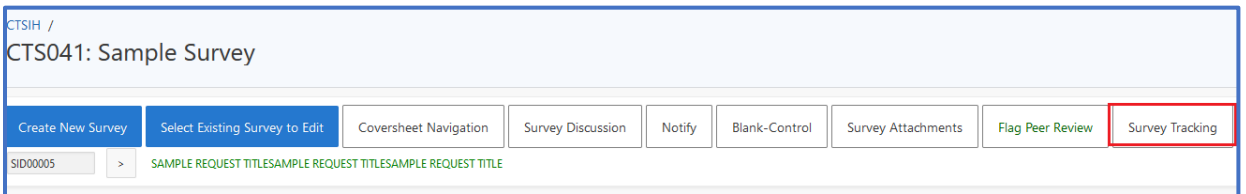


On main Sample Survey screen, red text is visible that reads “Flagged Ready For Peer Review”.



Survey Tracking

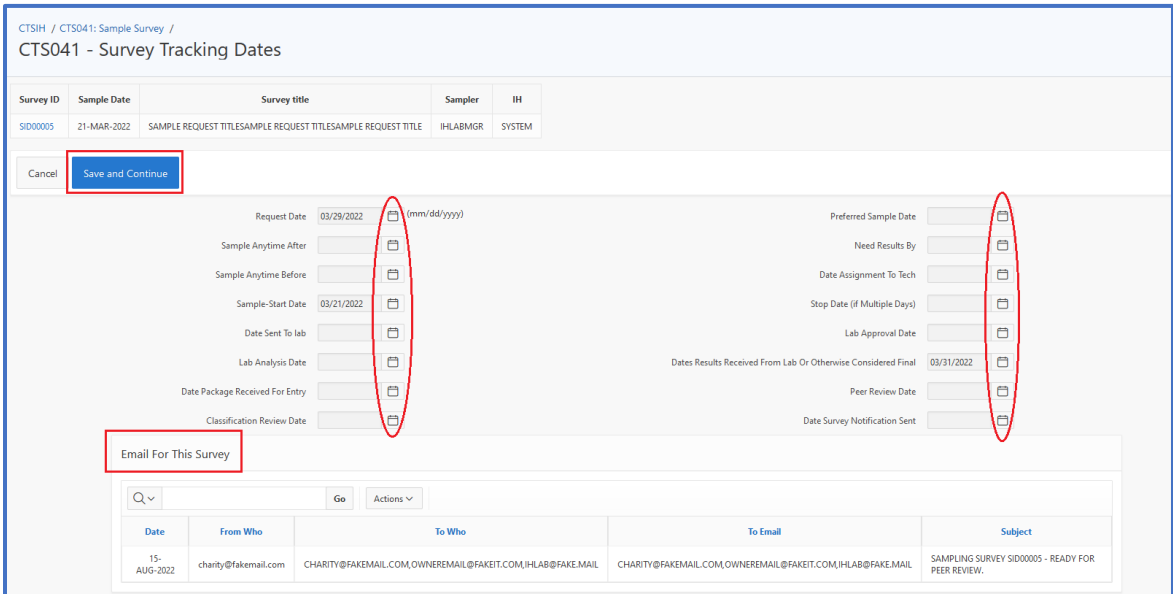
Select an existing survey. Click **Survey Tracking** button.



Use calendar buttons to select important dates.

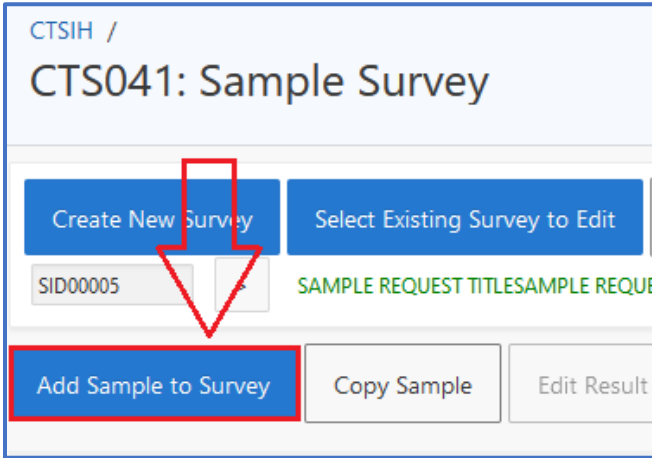
Note the email log for the current survey at bottom of screen.

Click **Save and Continue** button.



Add Personal Air Sample and Result

Select an existing survey. Click **Add Sample to Survey** button.



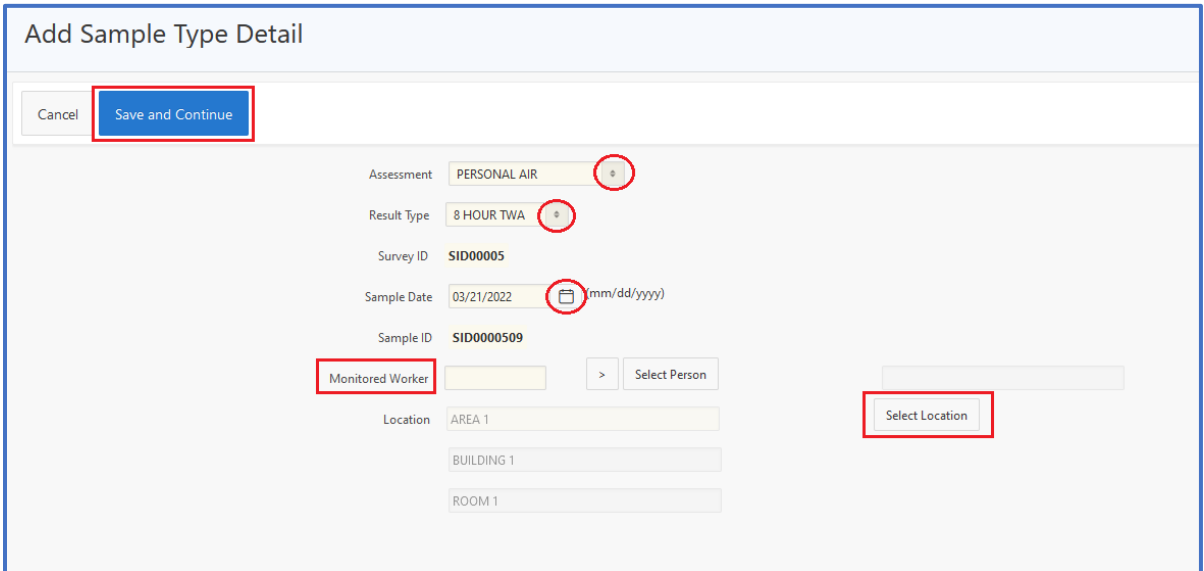
Use pulldown menus to select *Personal Air* as *Assessment* type and *8 HOUR TWA* as *Result Type*.

Use calendar button to select *Sample Date*.

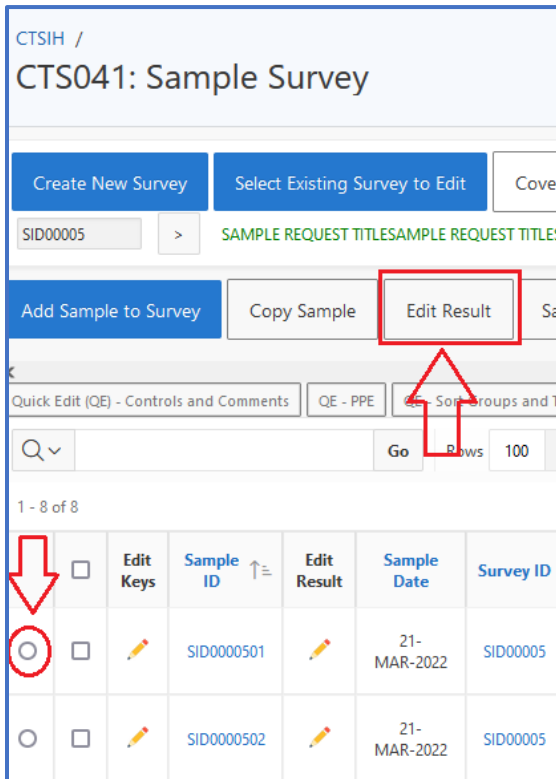
Click **Select Person** button to choose *Monitored Worker*.

Click **Select Location** button to change default location.

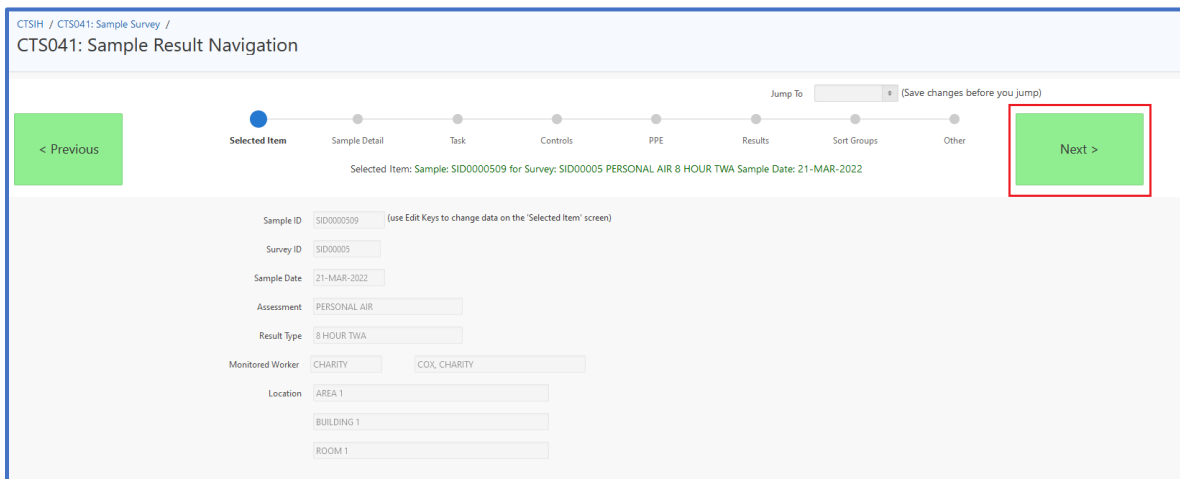
Click **Save and Continue** button.



Select a sample by clicking its radio button. Click **Edit Result** button.



Click **Next** button.



On the Sample Detail screen, select the *Monitoring Device ID* using the **Select Monitoring Device** button to the right of the pull-down menu.
Select the *Calibration* using the **Select Cal Equipment** button to the right of the Calibration pull-down menu.
Enter *Pre-Cal* and *Post-Cal* information.
Enter *Start Time* and *Stop Time* in military format (i.e., 0800).

Enter *Downtime* in minutes.

Enter text into the *Description of Sample Equipment and Placement While Sampling* text box.

Enter *Sampled Shift*.

Use pulldown menus to select *Sample Media-Device* and *Sample Method*.

Click **Save** button.

CTS041: Sample Result Navigation

Jump To (Save changes before you jump)

< Previous Selected Item **Sample Detail** Task Controls PPE Results Sort Groups Other Save >

Sample Detail: Sample: SID0000509 for Survey: SID00005 PERSONAL AIR 8 HOUR TWA Sample Date: 21-MAR-2022

Monitoring Device ID: SSSSSSSSSS [DDDDDD 0] Select Monitoring Device

Calibration: TEST2 [AAAA (AAAAAAA)] Select Cal Equipment

Pre-Cal: 10 (l/m) Post-Cal: 5 (l/m) Average Flow: 7.5 (l/m)

Start Time: 0800 Stop Time: 0830 Total Collection Time: 26 (minutes)

Downtime: 4 (minutes) Estimated Exposure: 26 (minutes)

Air Volume: 195 (liters)

Description of Sample Equipment and Placement While Sampling

Sampled Shift:

Sample Media-Device: CASSETTE Select Media-Device

Sample Method: NIOSH 7400 Select Method

Enter *Description of Work and Activities Happening at Time of Sampling* into text area.

Click **Save** button.

CTS041: Sample Result Navigation

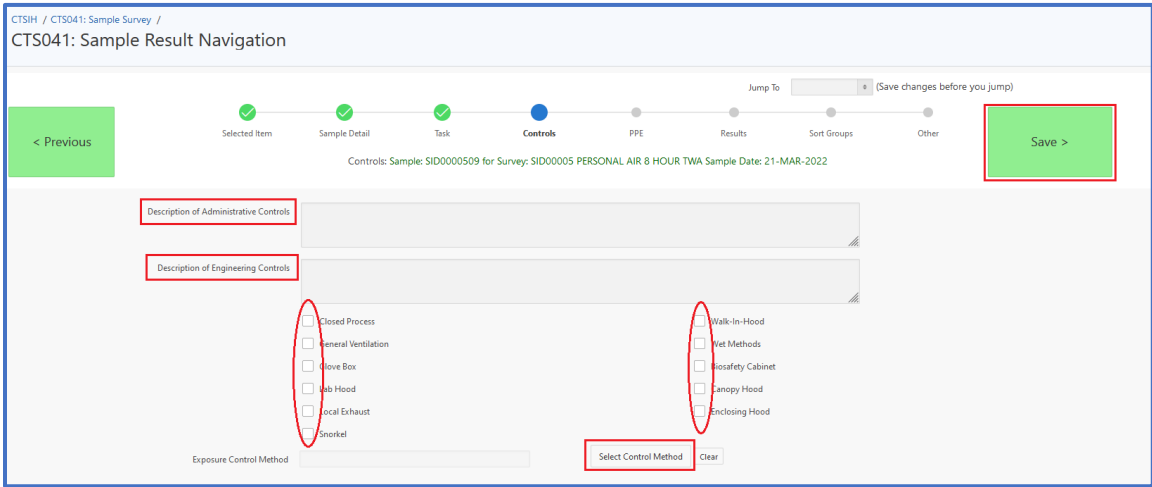
Jump To (Save changes before you jump)

< Previous Selected Item Sample Detail **Task** Controls PPE Results Sort Groups Other Save >

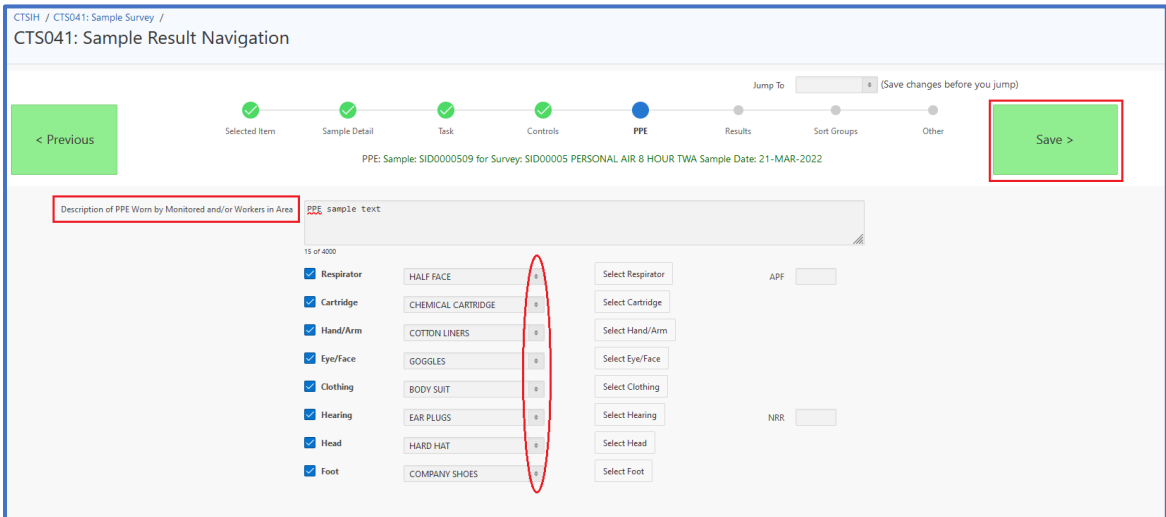
Task: Sample: SID0000509 for Survey: SID00005 PERSONAL AIR 8 HOUR TWA Sample Date: 21-MAR-2022

Description of Work and Activities Happening at Time of Sampling

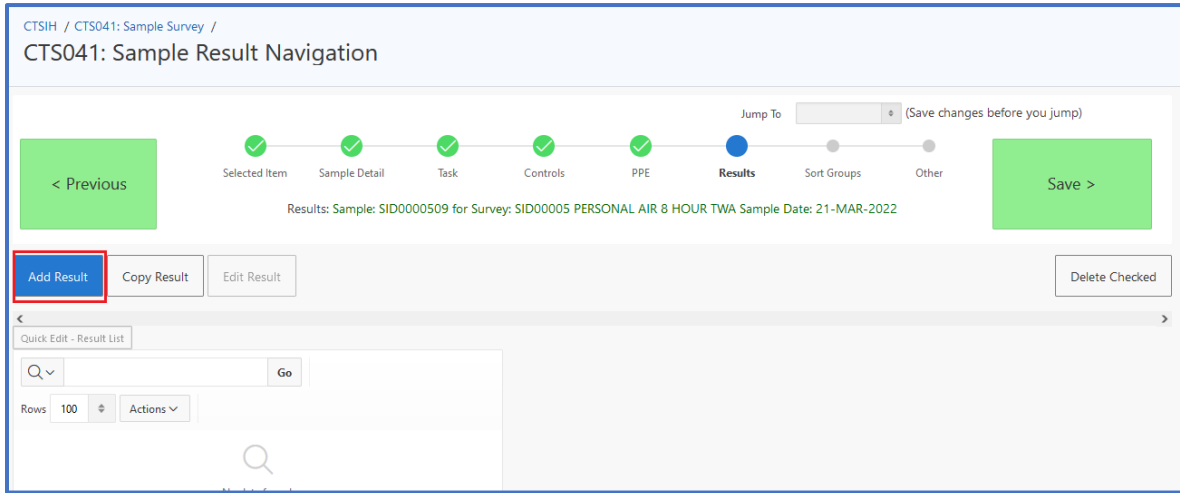
Enter text into *Description...* text areas. Click checkbox(es) to select controls. Click **Exposure Control Method** button to select a method. Click **Save** button.



Enter *Description of PPE...* in text area. Use pulldown menus to select PPE options. Click **Save** button.



Click **Add Result** button.



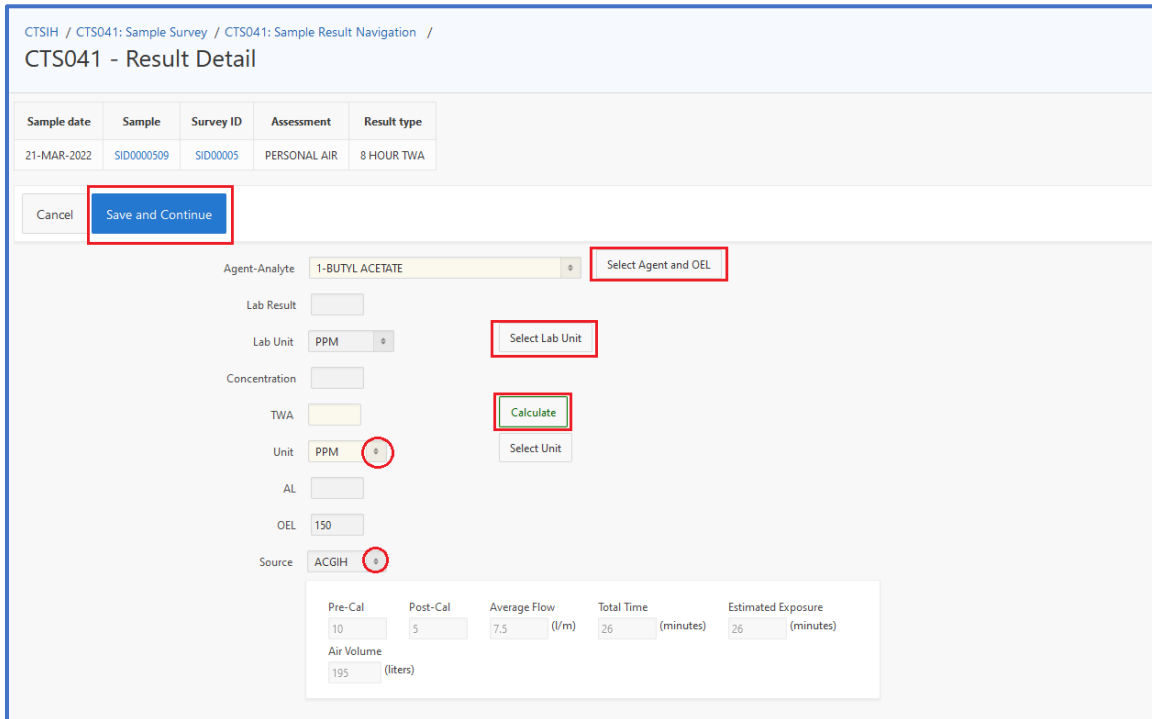
Click on the **Select Agent and OEL** button and select an agent.

Enter a *Lab Result* value. Then click the **Select Lab Unit** button to display the unit list.

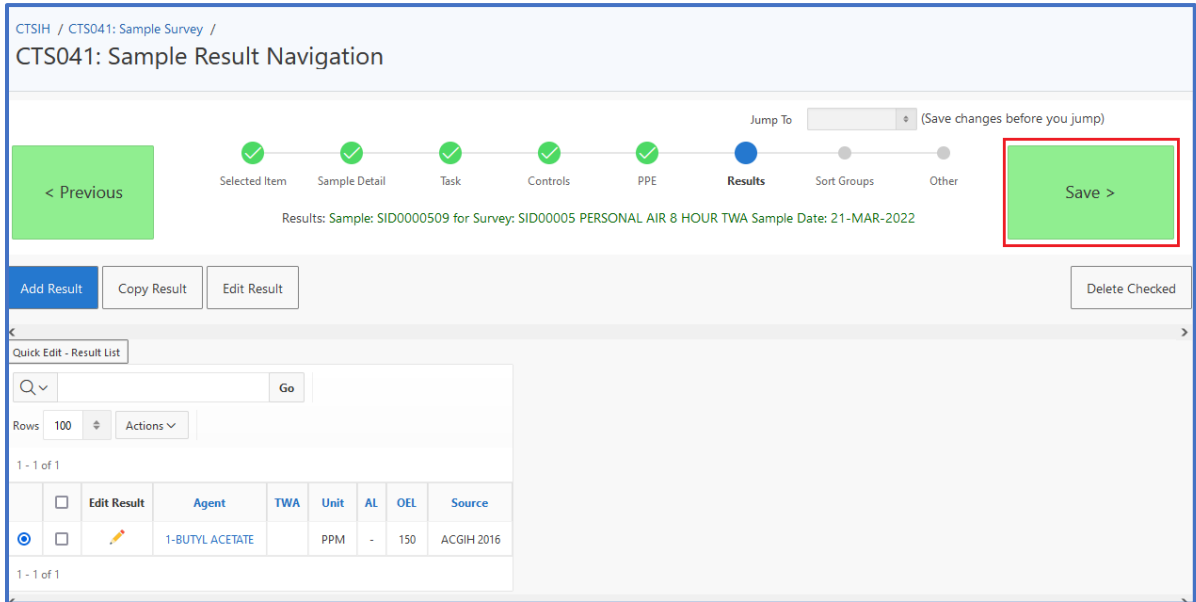
Click the **Calculate** button.

Enter an *OEL* if not already present. Use pulldown menus to select *Unit* and *Source*.

Click **Save and Continue** button.



Click **Save** button.



Select an *AU* using the **Select AU** button.

Select an *HRA* using the **Select HRA** button.

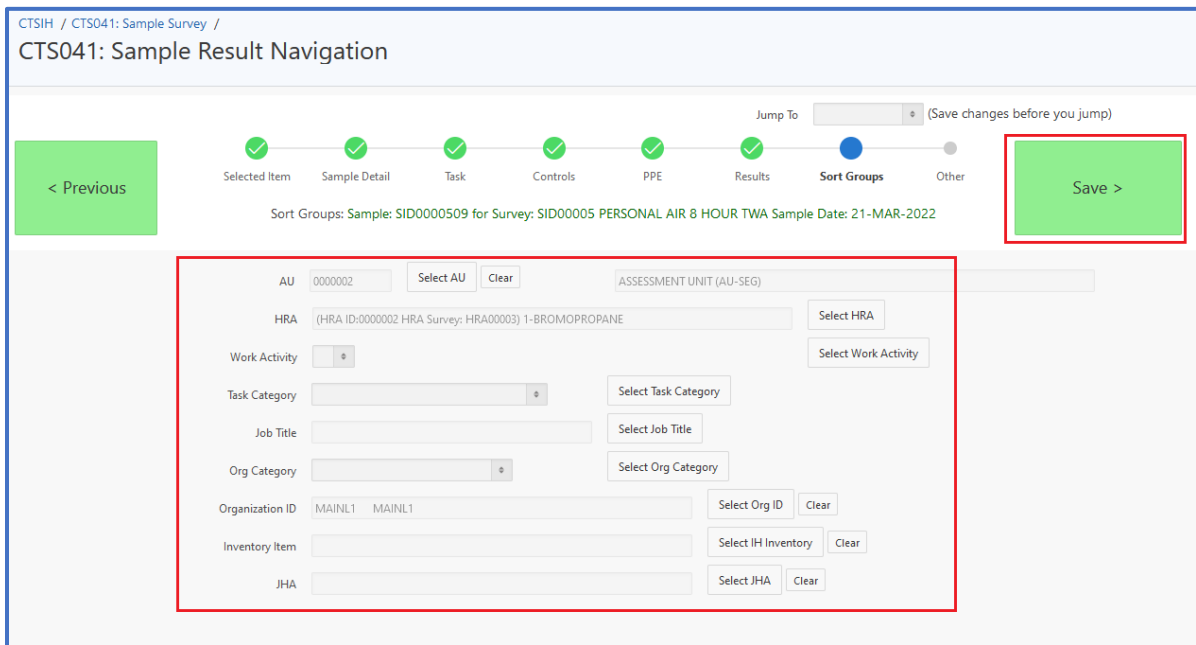
Select a *Work Activity* using the **Select Work Activity** button.

Select an *Organization ID* using the **Select Org ID** button.

Select an *Inventory Item* using the **Select IH Inventory** button.

Select a *JHA* using the **Select JHA** button.

Click **Save** button.



Select items from picklist using the buttons next to *Operation Status*, *Area Category*, and *Supervisor*.

Use pulldown menu to select *Worker Status When Monitored* option.

Enter text into *Sample...* text areas.

Click **Finish** button.

CTS041: Sample Result Navigation

Jump To [dropdown] (Save changes before you jump)

< Previous Selected Item Sample Detail Task Controls PPE Results Sort Groups Other Finish >

Other: Sample: SID0000509 for Survey: SID00005 PERSONAL AIR 8 HOUR TWA Sample Date: 21-MAR-2022

Operation Status [dropdown] Select Status

Area Category OFFICE AREA [dropdown] Select Category

Worker Status When Monitored [dropdown]

Supervisor [dropdown] > Select Person

Sample And Result Discussion [text area]

Sample Comments [text area]

Delete Existing Survey

Select an existing survey.

Click **Delete Survey** button.

Click **OK** in alert box to confirm.

CTS041: Sample Survey

Create New Survey Select Existing Survey to Edit Coversheet Navigation Survey Discussion Notify Blank-Control Survey Attachments Flag Peer Review Survey Tracking Edit Keys Report Delete Survey

SID00005 > SAMPLE REQUEST TITLESAMPLE REQUEST TITLESAMPLE REQUEST TITLE

Chapter 3 – Personal and Area Sampling

Understanding and Interpreting TWA Results

Time-Weighted Average (TWA) is the time-weighted average concentration for a normal workday or workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. TWAs may be for either 8, 10, or 12-hour workdays (8-hour TWA, 10-hour TWA, and 12-hour TWA result types, respectively), Excursions, and STELs.

Automatically Calculating TWAs

The Comprehensive Tracking System (CTS) can automatically calculate the time-weighted average (TWA) result of an agent monitored for a sample based on the sample data and lab results. Most common unit conversions are automatically performed as a part of this calculation.

This calculation uses the "standard" TWA formula:

$$\text{TWA Concentration} = (\text{Sample Concentration}) * (\text{Estimated Exposure Time}) / \text{TWA Time}$$

NOTE: When you initially calculate the Sample Time using the **Calculate** button on the sample screen, the Estimated Exposure time is set to exactly the sample time. The CTS TWA manager uses the Estimated Exposure Time to perform TWA calculations. Unsampled time by default is non-exposed time. You can manually adjust as appropriate the Estimated Exposure time to reflect a truer TWA calculation based on your knowledge of the sample period. See the business rules section of this chapter to see an example of how you might implement this model.

CTS currently supports automatic calculations for the following types of TWAs:

| Result Type | TWA Minutes |
|-------------|-------------|
| 8 Hour TWA | 480 |
| 10 Hour TWA | 600 |
| 12 Hour TWA | 720 |
| Excursion | 30 |
| STEL | 15 |

TWA Calculation Details

When performing the TWA calculation for the agent(s) analyzed with the sample the combination of lab units and TWA result units determine the formula used. The following table lists the combinations of lab units and TWA result units that are currently supported.

| Lab Unit | Description | TWA Result Unit | Description |
|----------|-------------------|-----------------|-----------------------------|
| UG | Micrograms | MG/M3 | Milligrams Per Cubic Meter |
| UG | Micrograms | UG/M3 | Micrograms Per Cubic Meter |
| UG | Micrograms | PPM | Parts Per Million |
| PPM | Parts Per Million | MG/M3 | Milligrams Per Cubic Meter |
| PPM | Parts Per Million | UG/M3 | Micrograms Per Cubic Meter |
| PPM | Parts Per Million | PPM | Parts Per Million |
| FF | Fibers Per Field | F/CC | Fibers Per Cubic Centimeter |

WARNING: Some labs perform TWA calculations for you. The lab units for this calculation refers to the raw sample value and NOT a TWA calculated value.

When converting TWAs in PPM to MG/M3, the equation used is based on 760 torr barometric pressure at 25 degrees Celsius (77 degrees Fahrenheit) where 24.45 is the molar volume in liters, giving a conversion equation of:

TWA in MG/M3 = (TWA in PPM) * (gram molecular weight of substance) /

24.45. Similarly, the equation used for converting TWAs in MG/M3 to PPM is:

TWA in MG/M3 = (TWA in PPM) * 24.45 / gram molecular weight of substance.

When the calculation is performed you will be prompted to enter / validate the molecular of the substance if the units require a conversion from parts per million (PPM) to weight volume (MG/M3 or UG/M3), or the reverse. Once you have entered the molecular weight of a substance that value will be remembered, and you will simply be prompted to verify the value when the calculation is performed.

How Do I Enter Multiple Samples For The Same TWA?

Many samples are continuous – that is to say, there is no break between the time you start sampling and the time you stop sampling. As such, the total sample time is the time between the start time and the stop time for the sample. This is the most common type of sample.

Some personal air samples, however, are non-continuous – they have multiple start and stop times, each with its own flow rates and lab result. Each of these are “pieces” of the same time-weighted average (TWA) – the same person is being monitored on the same day for the same agent and each of these non-continuous pieces must be combined to obtain the actual TWA result.

CTS provides for multiple start/stop times but only one start flow rate, stop flow rate, etc., for each sample. To handle multiple samples for the same TWA there are two suggested methods:

Option #1: Create a separate TWA sample record for each non-continuous sample that is part of the same TWA.

This has the advantage of allowing you to enter details for each sample that is part of the TWA using the standard sampling tools. You can calculate and synchronize the TWA result for two or more samples that are part of the same TWA by creating a link between the samples using the TWA Manager. This requires that the sample records be for the same person on the same date. Only 8 Hour TWA, 10 Hour TWA, 12 Hour TWA, Excursion, and STEL samples can be combined using the TWA Manager into a single TWA.

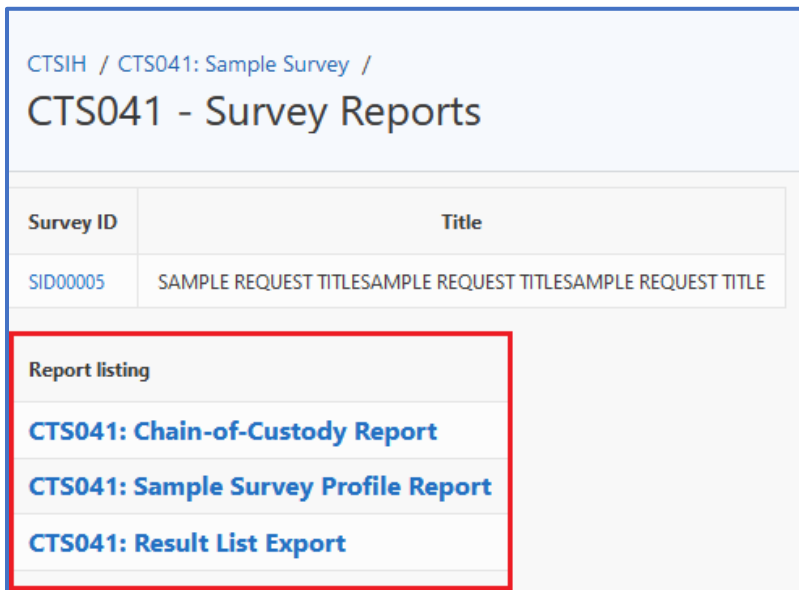
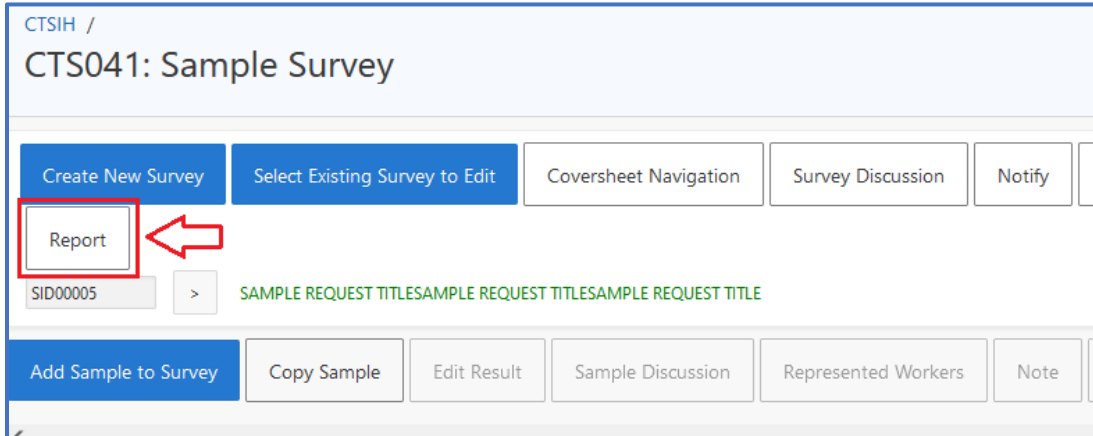
Option #2: Create a single TWA sample record.

Using this method, the details (start times, stop times, flow rates, lab results, etc.) for each part of the TWA are stored in the sample’s Comments field. This has the advantage of being relatively straightforward and easy to implement, but it doesn’t allow for the detail that many users prefer.

Chapter 4 – Industrial Hygiene Reporting

Sample Survey Reports

From **CTS041: Sample Survey**, click **Report** button.



Chain-of-Custody Report

Chain of Custody Report

Choose Report: 1 LANL FORMAT COC AIR SAMPLE 2 LANL COC WIPE SAMPLE 3 LANL COC BULK SAMPLES

Q Go Rows 100 Actions

1 - 7 of 7

| <input type="checkbox"/> | Survey ID | Sample ID | Assessment | Type | Sample Date | Total Minutes | Volume (liters) | Flow (liters/min) | Edit Comment | Comments To Analytical Lab | Edit Media | Sample Media | Sample Method |
|-------------------------------------|-----------|------------|-----------------|-------------------|-------------|---------------|-----------------|-------------------|--------------|----------------------------|------------|--------------|---------------|
| <input checked="" type="checkbox"/> | SID00005 | SID0000502 | PERSONAL AIR | 8 HOUR TWA | 21-MAR-2022 | - | - | 3.5 | | | | CASSETTE | NIOSH 7400 |
| <input checked="" type="checkbox"/> | SID00005 | SID0000503 | BULK SAMPLING | DUCT WORK | 21-MAR-2022 | - | - | 1 | | | | < > | NIOSH 7400 |
| <input checked="" type="checkbox"/> | SID00005 | SID0000504 | WATER SAMPLING | NON-POTABLE WATER | 21-MAR-2022 | - | - | 2 | | | | < > | NIOSH 7400 |
| <input checked="" type="checkbox"/> | SID00005 | SID0000505 | WIPE SAMPLING | CLOTHING | 21-MAR-2022 | - | - | - | | | | < > | NIOSH 7400 |
| <input checked="" type="checkbox"/> | SID00005 | SID0000506 | AREA AIR | BACKGROUND | 21-MAR-2022 | - | - | - | | | | WHATMAN 41 | NIOSH 7300 |
| <input checked="" type="checkbox"/> | SID00005 | SID0000507 | AREA BIOLOGICAL | AIROCELL-INDOORS | 21-MAR-2022 | - | - | - | | | | < > | NIOSH 7400 |
| <input type="checkbox"/> | SID00005 | SID0000508 | BLANK/CONTROL | BLANK/CONTROL | 21-MAR-2022 | - | - | - | | | | - | NIOSH 7400 |

Sample Survey Profile Report

Sample Survey Profile Report

Survey Profile Report - Survey Coversheet

Survey ID: SID00005
 Status: OPEN
 Survey Title: SAMPLE REQUEST TITLESAMPLE REQUEST TITLESAMPLE REQUEST TITLE
 Survey Date: 21-MAR-2022
 Location: AREA 1 BUILDING 1 ROOM 1
 IH-Safety officer: SYSTEM,INITIAL (ITBADGE)
 Primary Sampler: IHLABMGR,LARRY (IHEQPBADGE)
 Pre-Sample Plan: 000003

Request Description

Description of and Purpose for Sampling:
*Request Description and Purpose for Sampling
 *Request Description and Purpose for Sampling

Work Document Project Code: Charge To

Analytical Method

Sampling Method: NIOSH 7400
 Job to Analyze Samples: LIBERTY MUTUAL
 Description of Analysis Requested (for lab personnel)
 Description of analysis being requested

| Blanks/Controls | | | | |
|-----------------|--|--------|----------|----------|
| Sample | Analyzed agent | Result | Unit | Comments |
| SID0000508 | (1,5-CYCLOOCTADIENE) RUTHENIUM (II) CHLORIDE | 2 | FIBFIELD | |

Tracking

Request Date: 29-MAR-2022
 Sample Date (or start): 21-MAR-2022
 Dates Results Received from Lab: 31-MAR-2022

| Sample ID | Date | Assessment | Result Type | AU ID | Location | Agent | Result | Unit | OEL |
|------------|-------------|-----------------|-------------------|---------|--------------------------|----------------|--------|------|-----|
| SID0000501 | 21-MAR-2022 | DIRECT READING | GENERAL AREA | | AREA 1 BUILDING 1 ROOM 1 | | | | |
| SID0000502 | 21-MAR-2022 | PERSONAL AIR | 8 HOUR TWA | 0000002 | AREA 1 BUILDING 1 ROOM 1 | 1-BROMOPROPANE | 1 | PPM | 0.1 |
| SID0000503 | 21-MAR-2022 | BULK SAMPLING | DUCT WORK | | AREA 1 BUILDING 1 ROOM 1 | | | | |
| SID0000504 | 21-MAR-2022 | WATER SAMPLING | NON-POTABLE WATER | | AREA 1 BUILDING 1 ROOM 1 | | | | |
| SID0000505 | 21-MAR-2022 | WIPE SAMPLING | CLOTHING | | AREA 1 BUILDING 1 ROOM 1 | | | | |
| SID0000506 | 21-MAR-2022 | AREA AIR | BACKGROUND | | AREA 1 BUILDING 1 ROOM 1 | | | | |
| SID0000507 | 21-MAR-2022 | AREA BIOLOGICAL | AIROCELL-INDOORS | | AREA 1 BUILDING 1 ROOM 1 | | | | |

SAMPLE DETAIL
Sample ID: SID0000501 **Survey ID:** SID00005
Sample ID: SID0000501
Survey ID: SID00005
Sample Date: 21-MAR-2022
Assessment: DIRECT READING
Result Type: GENERAL AREA
Location: AREA 1 BUILDING 1 ROOM 1

Sample Detail
Monitoring Device: SSSSSSSSSSS DDDDDDD
Pre-Cal (l/m): 1 **Post-Cal (l/m):** 2 **Average Flow (l/m):** 1.5

Other
Operation Status: ACTIVE
Area Category: OFFICE AREA
Sample Method: NIOSH 7400

| Agent | Lab result | Lab unit | Concentration | Result | Unit | AL | OEL | Source |
|------------------------------------|------------|----------|---------------|--------|------|----|-----|--------|
| No sample results for this sample. | | | | | | | | |

Sample Discussion
Sample Comments
 Sample Comments
Sample And Result Discussion
 Sample And Result Discussion

SAMPLE DETAIL
Sample ID: SID0000502 **Survey ID:** SID00005
Sample ID: SID0000502
Survey ID: SID00005
Sample Date: 21-MAR-2022
Assessment: PERSONAL AIR
Result Type: 8 HOUR TWA
Location: AREA 1 BUILDING 1 ROOM 1

Sample Detail
Monitoring Device: SSSSSSSSSSS DDDDDDD
Pre-Cal (l/m): 3 **Post-Cal (l/m):** 4 **Average Flow (l/m):** 3.5

| Agent | Lab result | Lab unit | Concentration | Result | Unit | AL | OEL | Source |
|------------------------------------|------------|----------|---------------|--------|------|----|-----|--------|
| No sample results for this sample. | | | | | | | | |

SAMPLE DETAIL
Sample ID: SID0000505 **Survey ID:** SID00005
Sample ID: SID0000505
Survey ID: SID00005
Sample Date: 21-MAR-2022
Assessment: WIPE SAMPLING
Result Type: CLOTHING
Location: AREA 1 BUILDING 1 ROOM 1

Other
Area Category: OFFICE AREA
Sample Method: NIOSH 7400
Sample Media-Device: < >

| Agent | Lab result | Lab unit | Concentration | Result | Unit | AL | OEL | Source |
|------------------------------------|------------|----------|---------------|--------|------|----|-----|--------|
| No sample results for this sample. | | | | | | | | |

SAMPLE DETAIL
Sample ID: SID0000506 **Survey ID:** SID00005
Sample ID: SID0000506
Survey ID: SID00005
Sample Date: 21-MAR-2022
Assessment: AREA AIR
Result Type: BACKGROUND
Location: AREA 1 BUILDING 1 ROOM 1

Other
Area Category: OFFICE AREA
Sample Method: NIOSH 7300
Sample Media-Device: WHATMAN 41

| Agent | Lab result | Lab unit | Concentration | Result | Unit | AL | OEL | Source |
|------------------------------------|------------|----------|---------------|--------|------|----|-----|--------|
| No sample results for this sample. | | | | | | | | |

SAMPLE DETAIL
Sample ID: SID0000507 **Survey ID:** SID00005
Sample ID: SID0000507
Survey ID: SID00005
Sample Date: 21-MAR-2022
Assessment: AREA BIOLOGICAL
Result Type: AIROCELL-INDOORS
Location: AREA 1 BUILDING 1 ROOM 1

Other
Area Category: OFFICE AREA
Sample Method: NIOSH 7400
Sample Media-Device: < >

| Agent | Lab result | Lab unit | Concentration | Result | Unit | AL | OEL | Source |
|------------------------------------|------------|----------|---------------|--------|------|----|-----|--------|
| No sample results for this sample. | | | | | | | | |

Result List Export

| Survey ID | Sample ID | Sample Date | Assessment | Result Type | Survey Status | Monitored Worker | Wkr Badge | Air Volume | Total Time | Agent | CAS # | Lab Result | Lab Unit | Job Conc (Personal Air) | Result | OEL | Unit |
|-----------|------------|-------------|-----------------|-------------------|---------------|------------------|-----------|------------|------------|----------------|----------|------------|----------|-------------------------|--------|-----|------|
| SID00005 | SID0000501 | 03/21/2022 | DIRECT READING | GENERAL AREA | OPEN | - | - | - | - | - | - | - | - | - | - | - | - |
| SID00005 | SID0000502 | 03/21/2022 | PERSONAL AIR | 8 HOUR TWA | OPEN | SUPERVISOR, S S | SUPBADGE | - | - | 1-BROMOPROPANE | 106-94-5 | 1 | FIBFIELD | 1 | 1 | 0.1 | PPM |
| SID00005 | SID0000503 | 03/21/2022 | BULK SAMPLING | DUCT WORK | OPEN | - | - | - | - | - | - | - | - | - | - | - | - |
| SID00005 | SID0000507 | 03/21/2022 | AREA BIOLOGICAL | AIR/CELL-INDOORS | OPEN | - | - | - | - | - | - | - | - | - | - | - | - |
| SID00005 | SID0000505 | 03/21/2022 | WIPE SAMPLING | CLOTHING | OPEN | - | - | - | - | - | - | - | - | - | - | - | - |
| SID00005 | SID0000506 | 03/21/2022 | AREA AIR | BACKGROUND | OPEN | - | - | - | - | - | - | - | - | - | - | - | - |
| SID00005 | SID0000504 | 03/21/2022 | WATER SAMPLING | NON-POTABLE WATER | OPEN | - | - | - | - | - | - | - | - | - | - | - | - |

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References

OSHA Office of Training and Education. "Industrial Hygiene." n.d. *OSHA Office of Training and Education Library*. PDF. August 2022.
<https://www.osha.gov/sites/default/files/training-library_industrial_hygiene.pdf>.