

SJC WATER QUALITY LABORATORY METHOD APPROVAL FORM

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Revisions by:

Stefan Szalkowski
Laboratory Technician
SJCWQL Biology

Reviewed by:

Misty Brown
Biologist II
SJCWQL Biology

Approved by:

Jay P. Bottomley
Laboratory Supervisor
SJCWQL Biology

Final Approval:

Shawn Thompson
Laboratory Supervisor
Biological Sciences
SJCWQL

INTRODUCTION

The Biology Department of the San Jose Creek Water Quality Laboratory (SJCWQL) is responsible for collecting samples from receiving water stations along the San Gabriel River, Coyote Creek, San Jose Creek, Santa Clara River, and the Rio Hondo River. Weekly, monthly, quarterly, semi-annual and annual samples are collected under various permits, including Long Beach, Los Coyotes, Whittier Narrows, Pomona, Valencia, Saugus, and San Jose Creek Water Reclamation Plants, to meet National Pollution Discharge Elimination System (NPDES) requirements. Physical and chemical field observations are conducted during regular monitoring, which are included in monthly reports to the California Regional Water Quality Control Board. A small portion of the receiving water is collected with the assumption that it will be a representation of the water body as a whole. Samples collected for monitoring purposes are transported back to the laboratory in an appropriate manner to accurately represent the integrity of the receiving water.

1. Scope and Application

- 1.1. Receiving water samples are collected weekly, monthly, quarterly, semi-annually and annually to meet NPDES monitoring requirements.
- 1.2. Collection of samples also includes various physical and chemical measurements to be taken at the time of sampling.
- 1.3. Receiving water samples are not collected until at least 48 hours after a rain event, which is intended to minimize influence from runoff sources. If storm water runoff is observed, a sample cannot be collected until 48 hours after the observance of storm water runoff.

2. Summary of Procedure

- 2.1. Obtain sampling equipment based on sampling needs (refer to sampling equipment checklist and river run preparation sheets).
- 2.2. Obtain appropriate sample containers from the storage shed.
- 2.3. Obtain appropriate paperwork and labels from LIMS for each location.
- 2.4. Samples are collected at various receiving water stations.
- 2.5. Some samples may require chemical preservation (e.g., ammonia samples need to be preserved with 5.0 ml H_2SO_4 for every 1000 ml of sample).
- 2.6. Some samples may require pH, temperature, dissolved oxygen, and salinity measurements along with a chlorine residual check immediately following collection. Total residual chlorine, pH, temperature, dissolved oxygen concentration and time of analysis must be documented on the chain of custody (refer to Section 7.5 for details).
- 2.7. Samples are preserved on ice and transported back to the laboratory for analysis.

3. Handling & Preservation

- 3.1. Latex gloves must be worn when working with acids, when working with the bomb sampler, and during CH/DH low level copper sampling (refer to section 8.4.1.4).
- 3.2. Some samples require chemical preservation.
 - 3.2.1. Ammonia samples must be preserved with 5.0 ml H_2SO_4 for every 1000 ml of sample (1 vial per 1 liter sample).
 - 3.2.2. Total phosphate samples must be preserved with 2.5 ml HNO_3 for every 500 ml of sample (1/2 a vial per 500 ml sample).
 - 3.2.3. Total Hardness must be preserved with 1.25 ml HNO_3 for every 250 ml of sample (1/4 vial per 250 ml sample).
 - 3.2.4. Cyanide samples must be preserved with 6 NaOH pellets for every 500 ml of sample.
 - 3.2.5. Metals samples must be preserved with 2.5 ml HNO_3 for every 500 ml of sample.
 - 3.2.6. Oil & Grease samples must be preserved with 5.0 ml HCl for every 1000 ml of sample.
 - 3.2.7. Volatiles samples must be sampled in 40 ml clear vials pre-acidified with HCl.
- 3.3. Leave headspace in the sample containers that require metals, TKN, Oil & Grease and/or microbiological analysis.

- 3.4. Samples are preserved on ice and transported back to the laboratory for analysis.
- 3.5. Upon returning to SJCWQL, the samples are taken directly from the coolers to Sample Receiving (SRC) to be logged-in.

4. Interferences

- 4.1. Unsafe conditions may result in the cancellation of sample collection.
- 4.2. Receiving water samples are not collected until 48 hours after a rain event, which is intended to minimize influence from runoff sources. If storm water runoff is observed, a sample cannot be collected until 48 hours after the observance of storm water runoff.
- 4.3. Used or tampered containers may result in contamination of the sample.
- 4.4. If the bomb sampler's plunger is opened to air before it is ready for sample collection, it is considered contaminated and a new, sterile sampler must be used.
- 4.5. The pH or DO may fall out of acceptable range resulting in an exceedance. Should there be a pH exceedance of the permitted limits (pH must be between 6.5-8.5), record results, and check the instrument drift with pH 10 buffer (drift must be $< \pm 0.20$ of the initial drift reading). Should there be an exceedance of the permitted dissolved oxygen limits (DO must not be less than 5.0 mg O₂/L) record the results. After the exceedance, the pH or DO of the final effluent of the WRP outfall directly upstream of the site or the upstream receiving water site closest to the site with the exceedance, must then be tested as soon as possible after the exceedance is detected and that information must be recorded. This does not apply to locations upstream of WRP outfalls. If the WRP pH exceeds the limit as well, call Operations of the associated WRP and determine if there are any problems at the plant. Upon returning to SJCWQL, an e-mail memo of the exceedance must be written which should include: the time, date, location of exceedance, the value recorded, and values of the upstream site or WRP. The memo must be sent to Misty Brown, Biologist II, in the SJC Biology Group.
- 4.6. Coliform samples have a six-hour holding time. These samples must be turned into Microbiology within six hours of the sample time and they must be turned in by 2:15 P.M. for SJC Microbiology, and 1:00 P.M. for Valencia. Microbiology will obtain LIMS ID#s upon receipt of the samples.
- 4.7. Receiving water station LB-RA2 should be sampled at mid-tide (2.7') ± 15 minutes. Station LB-R6 should be sampled ± 30 minutes from the time of mid-tide. The river survey must be scheduled accordingly.
- 4.8. Biology staff must wear clean (non-contaminated) waders to prevent the spread of the New Zealand Mud snail (Refer to *Treatment Methods to Prevent the Spread of Aquatic Invasive Species* SOP).
- 4.9. During Clean Hands /Dirty Hands (CH/DH) low level copper sampling, samplers must take every precaution not to contaminate any of the sampling equipment especially the ends of the tube that go into the sample bottle and into the water. Samplers should help remind one another to change gloves once they have been potentially contaminated.

5. Apparatus & Equipment

5.1. Obtain the following equipment and supplies as necessary (refer to Appendix 2 for river run equipment and for CH/DH low level copper river equipment):

- 5.1.1. Fultz pump and hose reel (pump head, batteries, connector hose)
- 5.1.2. Stainless steel bucket
- 5.1.3. Safety Vest
- 5.1.4. Rope
- 5.1.5. Hardhat
- 5.1.6. Stop watch
- 5.1.7. Thermometer
- 5.1.8. Phone and blue-tooth headset
- 5.1.9. Coolers with ice
- 5.1.10. Safety glasses
- 5.1.11. Waders
- 5.1.12. Refractometer
- 5.1.13. Tape measure
- 5.1.14. Compass
- 5.1.15. G.P.S. unit
- 5.1.16. Boat, oars, flotation vest, anchor, pump, safety line
- 5.1.17. Bomb sampler with thin and thick ropes, lead weight
- 5.1.18. Funnel
- 5.1.19. Camera
- 5.1.20. Plastic Caddy
- 5.1.21. Newhall Land permits and rear-view mirror placard (for VA-RE)
- 5.1.22. Sigma sampler, battery, hose with pump head, pickle jar
- 5.1.23. Flowtracker, stadia rod, tagline, metal rods (rebar)
- 5.1.24. Calibrated pH meter and DO meter with log books

6. Reagents & Consumable Materials

6.1. Sample containers (Refer to river run prep binder).

6.2. Data sheets (Refer to river run prep binder).

- 6.2.1. Observation sheet forms can be found using the following pathway:
L:\WP51\SAMPLING_RIVER RUN\River Run Forms\River_Sampling_Guide.xls.
- 6.2.2. Weekly SJC Chlorine Run survey sheets can be found using the following pathway: L:\WP51\SAMPLING_RIVER RUN\Sampling Forms\Chlorine Run.xls.
- 6.2.3. Sample log-in forms are generated using LIMS for all receiving waters. To generate paperwork, sign into LIMS and go to *Systems* → *Run Reports*. Using the List of Values button (↓) select the “Login Form”. In the Parameters field, enter the collect date and Profile number. Click Submit. Download the paperwork and then print the log-in forms.

6.3. Labels

6.3.1 Labels are generated using LIMS for all receiving waters. To generate labels, sign into LIMS and go to *Samples* → *Labels*. Close the “Advanced Find” and “Labels” windows and then click “Auto Create” on the right-hand side of the menu button bar. Click the “Pre-Login” button and enter the profile number in the “Profile” field and the scheduled collect date in the “Sch Collected Date From” and “To” fields. Select “Labels for each container” on the right hand side of the “Create Labels” window and enter Biology’s printer number (105) into the “Printer” window. Click “Ok”. Click “Print” and click “Ok” to print the labels.

6.4. 1:1 Sulfuric acid vials

6.5. 1:1 Nitric acid vials

6.6. 1:1 HCL acid vials

6.7. NaOH pellets

6.8. Buffers (pH 4, 7, & 10), for standards and calibration

6.9. Chlorine residual kit (pH 4 buffer, starch, potassium iodide)

6.10. Pens/Markers (waterproof)

6.11. Disposable latex gloves

6.12. DI Water bottle

7. Preparation Procedures

7.1. Paperwork and bottle kits are typically prepared the day before a sampling event.

7.1.1. Print out paperwork and labels for the river run (refer to section 6.2).

7.1.1.1. Obtain the necessary bottles the bottle list found in the river run prep binder.

7.1.1.2. Bottle labels are printed using LIMS and can be cross-referenced with the bottle list found in the river run prep binder.

7.1.1.3. Write the initials of the samplers on each bottle label and write the sample site abbreviation on each bottles lid.

7.2. Santa Clara River chloride sample set-up:

7.2.1. Set sigma samplers 24-hours prior to the Santa Clara monthly, quarterly, semi-annual, and annual river runs (for chloride collection).

7.2.2. Equipment needed:

7.2.2.1. Sigma sampler

7.2.2.2. 10-L glass pickle jar

7.2.2.3. Lead-acid based battery

7.2.2.4. Clean silicon hose

7.2.2.5. Clean Teflon lined hose with strainer

7.2.3. Sampling Procedures

- 7.2.3.1. Before leaving the lab, check the battery life by: attaching the battery to the sampler, pressing the Power button, pressing the Status button and then checking that the voltage is above 12V.
- 7.2.3.2. Once in the field, assemble the sampler by: placing the pickle jar into the base of the sampler, placing the middle of the sampler onto the base, attaching the hose to the sampler, attaching the battery to the sampler and placing the sampling hose into the water (do not allow any part of the hose to be elevated above the pump of the sampler).
- 7.2.3.3. To begin sampling, press the Power button and wait for the Main Menu to appear. Go to System Set-up and select Time/Date Set-up. Set the current time and date. Go back to the Main Menu and select Program Set-up. Select Presets → “SCR CI Comp” and Load Program. Press the Run/Halt Program button and select Yes. Once the first sample is collected, check the pickle jar to ensure the sample is filling the jar.
- 7.2.3.4. Upon sample collection on the next day, check the pickle jar to ensure sample was collected and check the Sample History by selecting Status and scrolling down.
- 7.2.3.5. To collect the sample from the pickle jar, swirl the pickle jar and then pour off the sample into the bottle. Discard the rest of the sample in the pickle jar.

8. Sampling Procedures

- 8.1. See Appendix 1 of the “Sample Collection Methods for Acute and Chronic Bioassay Testing” SOP for sampling location details and directions.
- 8.2. Rinse sampling equipment (sampling pump, bucket, funnel, etc.) with receiving water prior to sampling.
- 8.3. Label all containers, with a minimum of sample location, date and time of collection, sample type (grab or composite), and initials of the sampler.
- 8.4. Collect the sample using the appropriate method.
 - 8.4.1. Grab: Samples from receiving water stations are collected using one of the following grab techniques. *Note: grab sampling time cannot exceed twenty minutes from start to finish.*
 - 8.4.1.1. Immersion grab: Facing upstream of flow, immerse suitable container in receiving water and lift out when filled.
 - 8.4.1.2. Field submersible sampling pump: Completely submerge pump head into sample water and purge sampler for approximately one minute or until the pump has been sufficiently purged. After purging is complete immediately collect samples.

- 8.4.1.3. Stainless steel bucket: Rinse bucket at least three times prior to filling bucket with sample. Face upstream and partially immerse bucket in stream and lift out when filled. Pour sample into containers.
- 8.4.1.4. CH/DH low level copper sampling: Collect low level copper samples at LB-R6, LB-R7, LB-R8 and LB-RA2. Assign one individual to be clean hands (CH), one individual to be dirty hands (DH) and one individual to assist both CH and DH when possible.

8.4.1.4.1 CH/DH sampling at LB-R6, LB-R7 and LB-R8 (bridge locations)

8.4.1.4.1.1 Upon arriving at the sample site, the assistant will determine the mid-depth by measuring the distance to the surface of the water from the top of the bridge railing, subtracting this value from the known distance to the bottom of the sampling site from the top of the bridge railing, and dividing this value by two.

8.4.1.4.1.2 The CH and DH individuals will complete an equipment blank at one of the sampling sites.

8.4.1.4.1.2.1 The DH individual will remove the top of the sigma sampler.

8.4.1.4.1.2.2 The DH individual will obtain a sterile bottle (double-bagged and sealed) and will open the outer bag. The CH individual will open the inner bag and unscrew the cap. The DH individual will place the bottle into the PVC holder in the sigma sampler's base ensuring that the bags are not blocking the bottle's opening.

8.4.1.4.1.2.3 The DH individual will open the outer bag of the sterile tubing and the CH individual will open the inner bag and remove the silicon (soft) tubing from the bag but will keep the rest of the tubing inside the bag. The CH individual will feed the silicon end into the hole on the sigma sampler and then into the bottle's opening to just below the neck of the bottle.

8.4.1.4.1.2.4 The DH individual will feed the silicon tubing through the pump of the sigma sampler.

8.4.1.4.1.2.5 The CH individual will place the hard (FEP-lined) end of the tubing into the sterile bottle (double-bagged and sealed) filled with DI water supplied by Weck Labs.

8.4.1.4.1.2.6 The CH individual will then carefully remove the silicon tubing from the empty bottle in order to pre-rinse the tubing before collecting the equipment blank.

8.4.1.4.1.2.7 The DH individual will then rinse the tubing by pressing the "Run/Halt" button, selecting "Yes," and allowing the water pass out of the tubing without entering the empty sample bottle.

- 8.4.1.4.1.2.8 The CH individual will then remove the hard FEP-lined end of the tubing from the bottle and place it back into its bag.
- 8.4.1.4.1.2.9 The DH individual will then obtain another sterile bottle (double-bagged and sealed) pre-filled with DI water from Weck Labs and will open the outer bag.
- 8.4.1.4.1.2.10 The CH individual will then open the inner bag, unscrew the cap, and place the hard FEP-lined end of the tubing into the bottle. The CH individual will then carefully replace the silicone tubing into the neck of the empty sample bottle in the Sigma sampler.
- 8.4.1.4.1.2.11 The DH individual will sample the water from the bottle by pressing the “Run/Halt” button and selecting “Yes”.
- 8.4.1.4.1.2.12 The CH individual will screw the cap onto the now filled sterile bottle and will seal the inner bag. The DH individual will seal the outer bag, place the label with the time written on it and will place the bottle into the cooler filled with bagged ice.
- 8.4.1.4.1.2.13 The tubing used to conduct the equipment blank can be used again at the sample site where the blank was conducted as long as it is not contaminated.

8.4.1.4.1.3 The CH and DH individuals will collect a sample from the sample site.

- 8.4.1.4.1.3.1 As with the equipment blank, the CH and DH individuals will place a sample bottle into the base and feed the tubing through the sigma sampler.
- 8.4.1.4.1.3.2 The CH individual will hold the tubing so that the DH individual can attach a weight to the hard FEP-lined end of the tubing using a 3-inch section of silicone tubing (spliced lengthwise) and two zip ties. The weight should be near the end of the tubing but should not interfere with the opening of the tubing. The DH individual will wrap the spliced silicone tubing around the hard FEP-lined tubing and use the zip ties to attach the weight over the silicone tubing to prevent slippage.
- 8.4.1.4.1.3.3 The DH individual will zip tie a glove around the tubing. The glove is tied onto the tubing at mid-depth. For example, if the total depth of water is eight feet, then the mid-depth is four feet; the glove is tied to the tubing four feet from the tip.
- 8.4.1.4.1.3.4 The DH individual will program the sigma sampler by: pressing the Power button, waiting for the Main Menu to appear, selecting System Set-Up → time/date set-up and then setting the current time and date. Then go back to the

- Main Menu and select Program Set-up → Presets → “CH DH 1LITER” → Load Program. Then Press Program Setup → Modify Selected → Program Delay → Enable and then set an appropriate sampling time that is a few minutes into the future. Press the Run/Halt button and select Yes. Place the top of the sigma sampler onto the sigma sampler.
- 8.4.1.4.1.3.5 While the CH and DH individuals are getting the sigma sampler ready, the assistant should be preparing the sigma sampler for lowering by tying one end of the rope to the railing of the bridge, feeding the rope through the ABS (black) pipe and the pulley of the sampler harness, tying off the other end of the rope to the bridge, and attaching the harness to the sigma sampler’s eye hooks.
- 8.4.1.4.1.3.6 Once the sigma sampler is programmed and the harness is attached, the assistant can carefully lift the sampler up and over the railing. The DH individual will securely hold onto the untied end of the rope while the CH individual holds the tubing. The assistant will slowly lower the sampler over the edge and then CH individual will release the tubing and the DH individual will lower the sigma sampler to the water’s surface.
- 8.4.1.4.1.3.7 Once the sampler has sampled, the DH individual will raise the sampler (Note: the CH individual should grab and hold the probe end of the sample tubing to prevent contamination in case the sampler needs to be lowered for a second collection or re-sampling for a missed sample or low sample volume) and the assistant will lift the sampler back over the railing and will gently place the sampler on to the ground.
- 8.4.1.4.1.3.8 The assistant will undo the harness and latches on the sigma sampler while the CH and DH individuals put on new gloves.
- 8.4.1.4.1.3.9 The CH individual will remove the sample bottle. If collecting a duplicate sample, proceed directly to section 8.4.1.4.1.3.9.1. Otherwise, the CH individual will pour less than half of the collected sample into the 500ml plastic bottle. Proceed to section 8.4.1.4.1.3.10.
- 8.4.1.4.1.3.9.1 When collecting a duplicate, the CH individual will pour less than half of the sample into another empty double-bagged pre-cleaned sample bottle.
- 8.4.1.4.1.3.9.1.1 For monthly runs, the DH individual will place the inner bottle platform with the rectangular sleeve on the bottle holding arm and insert a 500mL plastic bottle. For quarterly and semi-annual river runs, place a 1L clear glass bottle (to pour off into the in-house sample bottles)

without the platform and sleeve into the sampler's PVC bottle holding arm.

- 8.4.1.4.1.3.9.1.2 The DH individual will re-program the sigma sampler by: pressing the Main Menu button and select Program Set-up → Presets → CH DH 500mL → Load Program. Then Press Program Setup → Modify Selected → Program Delay → Enable. Then set an appropriate sampling time that is a few minutes into the future. Press the Run/Halt button and select Yes. Place the top of the sigma sampler onto the sigma sampler.
- 8.4.1.4.1.3.9.1.3 The sampler will be lowered again to the water to collect a sample for the total and soluble metals samples.
- 8.4.1.4.1.3.9.1.4 Once finished sampling, the DH individual will raise the sampler and the assistant will help lift it over the bridge railing while the CH individual holds the sampling line as in section 8.4.1.4.1.3.7.
- 8.4.1.4.1.3.9.1.5 The CH individual will then remove and pour from the 500mL bottle (monthly runs) or 1L clear glass bottle (quarterly and semi-annual runs) into the sample bottles.
- 8.4.1.4.1.3.10 The CH individual will screw the cap on the sterile bottle(s) and seal the inner bag(s). The DH individual will seal the outer bag(s), write the sample time on the label, and place the bottle(s) into the cooler filled with bagged ice.

8.4.1.4.2 LB-RA2 remote controlled boat sampling

8.4.1.4.2.1 The procedures for preparing the boat and sampler at LB-RA2 are similar to the procedures for preparing the sigma sampler unit at the bridge sample sites.

- 8.4.1.4.2.1.1 The DH individual will obtain a sterile bottle, double bagged and sealed, and will open the outer bag. The CH individual will open the inner bag and unscrew the cap. The DH individual will place the bottle into the foam holder ensuring that the bags are not blocking the bottle's opening.
- 8.4.1.4.2.1.2 The DH individual will open the outer bag of the sterile tubing and the CH individual will open the inner bag and remove the silicon tubing from the bag but will keep the rest of the tubing inside the bag. The CH individual will place the silicon end of the hose into the bottle's opening without placing too much of the tubing into the bottle.

- 8.4.1.4.2.1.3 The DH individual will feed the silicon tubing through the pump of the sigma sampler.
- 8.4.1.4.2.1.4 The CH individual will attach the weight to the hard FEP-lined end of the tubing using two zip ties. The weight should be near the end of the tubing but should not interfere with the opening of the tubing.
- 8.4.1.4.2.1.5 The CH individual will zip tie the tubing to one of the boat's eyehooks according to the desired mid-depth measurement.
- 8.4.1.4.2.1.6 The DH individual will program the sigma sampler by: pressing the Power button, waiting for the Main Menu to appear, selecting System Set-Up → time/date set-up and then setting the current time and date. Then go back to the Main Menu and select Program Set-up → Presets → CH DH Boat → Load Program. Then Press Program Setup → Modify Selected → Program Delay → Enable and then set an appropriate sampling time that is a few minutes into the future. Press the Run/Halt button and select Yes.
- 8.4.1.4.2.1.7 While the CH and DH individuals are getting the sigma sampler ready, the assistant should be preparing the boat for launch by unwinding the boat rope, attaching the fan to the boat with bungee cords and attaching the boat battery to the wire connectors. The assistant can then turn on the remote control and make sure that the fan functions properly. Once the sigma sampler is programmed, the assistant can secure the sigma sampler to the boat with bungee cords.
- 8.4.1.4.2.1.8 Once the sigma sampler is programmed and the boat is ready, the DH individual can carefully carry the boat and place it into the water. The DH individual will hold onto the boat rope and feed out more rope after the boat is launched. The DH individual will push the boat upstream of the sample site, the CH individual will let go of the sampling tubing and the assistant will motor the boat towards the sample site.
- 8.4.1.4.2.1.9 Once the sampler has sampled, the DH individual will pull the boat back to the shore using the boat rope. The assistant will carefully lift the boat out of the water and place it on land.
- 8.4.1.4.2.1.10 The CH and DH individuals will want to put on new gloves before handling the sample bottle.
- 8.4.1.4.2.1.11 If collecting for a duplicate, refer to steps in section 8.4.1.4.1.3.9.1.
- 8.4.1.4.2.1.12 The CH individual will remove the sample bottle and will carefully pour less than half of the collected sample into the 500ml plastic bottle held by the DH individual. The CH

individual will screw the cap on the sterile bottle and seal the inner bag. The DH individual will seal the outer bag, write the sample time on the label, and place the bottle into the cooler filled with bagged ice.

8.4.1.4.3 Field Blank

8.4.1.4.3.1 At one of the sample sites, a field blank will be conducted using the double-bagged, sterile bottle filled with water from WECK laboratory.

8.4.1.4.3.2 After the CH/DH individuals have placed the opened sample bottle into the sigma sampler, the CH/DH individuals will open the bags containing the sterile field blank bottle and will open the bottle. The field blank and sample bottle should be opened at the same time. The bottle should be placed in a safe place and will remain open until the sample bottle from that sample site has been closed. The field blank bottle should then be closed along with the bags, and placed into the cooler.

8.4.1.5. Bomb sampler: *(Used on a monthly basis for collection of coliform and volatile samples at estuary stations)*

8.4.1.5.1. Before the bomb sampler is used, it must be cleaned with warm tap water and liquinox, rinsed with de-ionized water, and autoclaved by the microbiology group.

8.4.1.5.2. Use a bomb sampler for each estuary station. Bring additional samplers for backup in case one becomes contaminated prior to use. Do not re-use the bomb sampler after the plunger has been opened.

8.4.1.5.3. To set the bomb sampler at mid-depth, first use the lead weight with the thicker of the two ropes to find the depth to the bottom. Mark or hold onto the place on the rope when the weight hits bottom and then retrieve the weight to the water surface. Mark or hold the place on the rope when the weight is at the surface. Now find the midpoint between the bottom mark and surface mark on the rope and this will be the mid-depth. Retrieve the weight.

8.4.1.5.4. Disconnect the lead weight from the thick rope and connect the bomb sampler. Gloves must be worn to avoid contamination of the sampler.

8.4.1.5.5. Connect the thinner rope to the plunger on the bomb sampler. Be careful not to open the plunger until the sampler is set at mid-depth. Allow yourself plenty of slack in the thinner rope.

8.4.1.5.6. Before lowering, remove the aluminum foil. Lower the sampler by the thicker rope to the previously found mid-depth.

8.4.1.5.7. Once at mid-depth, pull the thinner plunger rope to allow water to enter into the sampler. You should see some bubbles rise to the surface.

- 8.4.1.5.8. Retrieve the sampler by the thicker rope. Avoid any tension on the thinner plunger line because this will release the sample.
 - 8.4.1.5.9. Once retrieved, the sample can be expelled out the bottom of the sampler and into a sample bottle by slowly pulling the plunger.
- 8.4.2. Coliform and volatile samples must be collected using a sterile sampling technique.
- 8.4.2.1. Freshwater samples must be collected using the immersion grab technique.
 - 8.4.2.2. Estuary stations must be collected using the bomb sampler.
 - 8.4.2.3. Coliform samples must be returned to the microbiology lab within six hours of the time in which they were collected. They must also arrive at the SJC microbiology lab by 2:15 P.M. to allow for analysis time. If the samples are collected along the Santa Clara River, they must be delivered to the Valencia TPL by 1:00 P.M. to allow for analysis time. The laboratory responsible for the analysis will log in the samples.
- 8.5. Make on-site observations and take water quality readings as necessary.
- 8.5.1. Fill out the field observation sheet with the required information for all receiving water samples and stations.
 - 8.5.2. Receiving water samples must be tested quantitatively for pH, temperature, and dissolved oxygen immediately upon collection.
 - 8.5.2.1. Temperature and pH are assessed using a Beckman 350 pH/Temp/mV meter (see appropriate instrumentation SOP for maintenance and calibration procedures).
 - 8.5.2.2. Water temperatures recorded with the field pH meter must have the appropriate correction factors applied.
 - 8.5.2.3. Record results in appropriate place on the Observation Sheet along with the time and analyst's initials.
 - 8.5.2.4. Temperature is recorded in degrees Fahrenheit (°F).
 - 8.5.2.5. Should there be an exceedance of the permitted pH limits, refer to Section 4.5.
 - 8.5.2.6. Dissolved oxygen is assessed using an YSI Model 58 dissolved oxygen meter (see appropriate instrumentation SOP for maintenance and calibration procedures).
 - 8.5.2.7. Record results in appropriate place on the Observation Sheet.
 - 8.5.2.8. Should there be an exceedance of the permitted dissolved oxygen limits, refer to Section 4.5.
 - 8.5.3. Those receiving water samples, which require a chlorine residual check, must be tested qualitatively immediately upon collection.
 - 8.5.3.1. A chlorine residual is performed on a 100 ml subsample of receiving water. In an Erlenmeyer flask containing the 100 ml subsample, add approximately

4 ml of sodium acetate (pH 4 buffer) to flask. Next, add approximately 1 g of potassium iodide crystals and mix. Add approximately 1 ml of starch. If the sample turns a blue color, chlorine is present.

- 8.5.3.2. If chlorine is present, the residual chlorine of the sample remaining in the bucket must be quantified immediately at the nearest treatment plant laboratory (TPL). Call Misty Brown at extension 3035 before leaving the location. Quantify the chlorine according to Test 302 in the Laboratory Procedures Manual. Notify the Supervisor of Treatment Plant Operations for the appropriate plant. Upon returning to SJCWQL, an e-mail memo of the violation must be written which should include the time, date, and location of the violation, any significant observations, and residual chlorine values determined at the TPL, along with any other chlorine data taken from other location(s). The memo must be addressed to Misty Brown and Carlita Barton.
- 8.5.4. Flow measurements must be taken at each receiving water station. Refer to “Current Flow Measurements” in Appendix 1 to determine which flow method is used for each station.
 - 8.5.4.1. Flow at LB-RA-1 on Coyote Creek is estimated by measuring the distance from the water line to the mark (nail with painted “X”) at the top of the low flow channel. The distance is then converted to flow utilizing the excel spreadsheet for river observations.
 - 8.5.4.2. Flow at station LC-R31 on the San Gabriel River is estimated by measuring the distance from the water line to the mark (nail with painted “X”) at the top of the low flow channel. The distance is then converted to flow utilizing the excel spreadsheet for river observations.
 - 8.5.4.3. Flow at station WN-RD1 on the Rio Hondo River is estimated by measuring the distance from the top of the concrete to the surface of the water. Next, measure the time that it takes for a floating object to travel 10 feet. These two values are used to determine flow by utilizing the excel spreadsheet for river observations.
 - 8.5.4.4. Flow at station WN-RB on the Rio Hondo is estimated by measuring the distance from the top of the concrete bridge to the surface of the water. Next, measure the time that it takes for a floating object to travel 10 feet. These two values are used to determine flow by utilizing the excel spreadsheet for river observations.
 - 8.5.4.5. Flow for the Whittier Narrows, San Jose Creek and Pomona WRPs are obtained from Mike Creel, Superintendent of Water Reclamation Plant Operations. Contact Misty Brown for the flow values from the Long Beach, Los Coyotes, Valencia and Saugus WRPs. An email with all applicable plant discharge points and sampling times is sent at the end of each month. All flow values should be obtained ASAP in order to record the river observations into LIMS within 1 week of collection.

- 8.5.4.6. Flow at POM-RC, POM-RD, VA-RC and VA-RE is determined by using the flow meter. Refer to L:\WP51\SAMPLING_RIVER RUN\SOP\Steam Gauging Flowtracker.
 - 8.5.4.7. If it is not possible to collect a sample at a receiving water station indicate why a sample was not collected in the notes section. If the site is dry, for example, enter “No water present; Dry” on the observation sheet and the LIMS paperwork. Obtain a LIMS ID# and then give the paperwork to Misty immediately so that she can cancel the record.
- 8.5.5. There are specific instructions to follow when sampling SJC-R10 and SJC-R12.
- 8.5.5.1. SJC-R10 is only sampled if flow is observed coming over the dam.
 - 8.5.5.2. SJC-R12 is only sampled if SJCWRP is discharging from SJC outfall 001A and the discharge is flowing into the river, not into the spreading grounds.
- 8.5.6. Some stations require the WRP to be discharging to the receiving water before a sample can be collected. WRP operations must be called to verify that discharge is present and a backwashing cycle is not in affect.
- 8.5.6.1. Before sampling at LB-RA and LB-RA1, call LB operations at (562) 421-8612 to ensure that discharge is present.
 - 8.5.6.2. Before sampling at Pom-RA, call Pomona operations at (909) 622-3623 to ensure that discharge is present.
 - 8.5.6.3. Only sample at SJC-C2 when discharge is present (typically after 10:00 a.m.). If discharge is not present, call operations at (562) 699-7411 (X3005 or X3007) to determine when, or if, discharge can be expected.
- 8.6. Collect subsamples for chemical analysis.
- 8.6.1. Collect samples for analysis from receiving water stations. Chemical and field analyses will vary depending on the particular run.
 - 8.6.2. Refer to section 3 for sample handling and preservation.
- 8.7. Rain
- 8.7.1. No sampling of receiving waters can occur within 48 hours of any significant rain event, which is considered to be approximately a tenth of an inch or enough rain to cause storm water runoff. This is intended to minimize influence from runoff sources. Refer to “Steps to Take after Rainfall” in Appendix 3.
 - 8.7.2. If a river run was cancelled due to rain in any given week, it will be rescheduled. If a weekly run cannot be made up due to continuous rainfall, make a note on the observations sheet that sampling could not be conducted for the week due to rain.
- 8.8. Sample processing upon arrival to SJCWQL.
- 8.8.1. Log in samples to SRC.

- 8.8.2. Fill out the "RELINQUISHED BY" section, including signature and printed name of person relinquishing the samples, date and time.
- 8.8.3. The "RECEIVED BY" section is to be filled out by the person that receives the samples (i.e. SRC personnel).
- 8.8.4. Keep the photocopied login forms and write in LIMS ID#s on the river run observation sheet.
- 8.8.5. Coliform samples are submitted to the appropriate lab (SJC microbiology or VA TPL) for bacterial analysis.
- 8.8.6. Enter the data from the Ambient Observation Sheets into the appropriate EXCEL spreadsheet (L/WP51/Sampling_River Run/Reports "year"/River Runs/RiverRun(LIMS-TP).xls).
- 8.8.6.1 Transfer and post data in LIMS.
- 8.9. Enter the results of the field analyses from the Ambient Observation Sheets and Weekly SJC Chlorine Monitoring sheets into LIMS immediately.
 - 8.9.1. Enter LIMS by choosing "Horizon" icon on computer desktop.
 - 8.9.2. Login to LIMS.
 - 8.9.3. Select *Batching* → *New Batch* from the menu bar.
 - 8.9.4. The queue for field data entry is "FLDI". Type this in the Queue field.
 - 8.9.5. Double click the "FLDI" queue in the New Batch window to bring up the list of available samples.
 - 8.9.6. Un-check any samples you do not want to enter data for, and click "Build Batch."
 - 8.9.7. Enter "2" ("Change by Job Number") under Test Result Processing. Save the batch and close the pop-up report window. Write the Batch number on the observation sheet. Select *Operations* → *Posting* → *By Batch* from the menu bar.
 - 8.9.8. For each sample in the batch:
 - 8.9.8.1. Double-click the CC field next to the Type field.
 - 8.9.8.2. Enter the date and time of the measurements in the Run Date field.
 - 8.9.8.3. Enter results next to each parameter.
 - 8.9.8.4. Click "Save" and repeat for every sample in the batch.
 - 8.9.8.5. Close all windows when finished.
9. Report Verification and Transfer
 - 9.1. All river run (Long Beach, Los Coyotes, Whittier Narrows, Saugus, Valencia, Pomona, and San Jose Creek) observation sheets must be verified by Misty Brown. Data must be verified in LIMS within 7 days of the sample date.
 - 9.2. Once verified and signed, the observation sheets go into the River Run binder.
10. Calculations
 - 10.1 For flow calculations refer to the "Current Flow Measurements" form (Refer to Appendix 1).
11. Quality Control

- 11.1 All NPDES samples collected require a chain of custody/log-in sheet to track the sample. Observations are also documented to record the current conditions at the time of sample collection.
- 11.2 All samples are checked when they are relinquished to ensure that they meet the temperature requirements and are in the same condition as they were upon sample collection.
- 11.3 If a pH exceedance occurs, the pH 10 buffer is checked to ensure that the meter is within the acceptable range. If the meter is out of range, the meter must be recalibrated and a new reading must be taken.
- 11.4 All chemical analyses are verified to ensure accuracy.

12. Method Performance

- 12.1 The sampler (e.g. bucket, pump, etc.) must be thoroughly rinsed with receiving water before the sample is collected to avoid contamination among receiving water samples.
- 12.2 Sample containers must be new and clean to avoid contamination.
- 12.3 Bomb samplers must be autoclaved and sterile to avoid contamination.
- 12.4 All samples must be transported to the SJCWQL in ice, and upon arrival, samples should be $<5.0^{\circ}\text{C}$.
- 12.5 Sample bottles that are leaking or damaged will not be submitted for chemical analysis.

Appendix 1:

Flow Requirements

CURRENT FLOW MEASUREMENTS (apply to river runs & bioassay sample collections)

LONG BEACH	
Station	Current Flow Measurements (flow units = cfs)
LB-RA1	Measurement of water height, conversion using Manning's Table (tape measure)
LB-RA	LB-RA-1 + LBWPR discharge
LB-RA2	Qualitative estimates (Above normal, Normal, Below normal)
LB-R6	Qualitative estimates (Above normal, Normal, Below normal)
LB-R7	Qualitative estimates (Above normal, Normal, Below normal)
LB-R8	Qualitative estimates (Above normal, Normal, Below normal)

LOS COYOTES	
Station	Current Flow Measurements (flow units = cfs)
LC-R31	Measurement of water height, conversion using Manning's Table (tape measure)
LC-R4	LC-R31 + LCWRP discharge
LC-R9W	Qualitative estimates (Above normal, Normal, Below normal)

WHITTIER NARROWS	
Station	Current Flow Measurements (flow units = cfs)
WN-RD1	Use of table providing for area and surface velocity.
WN-RD	WN-RD-1 + WNWRP discharge flow (004)
WN-RC	Currently not in use
WN-RB	Use of table providing for area and surface velocity.
WN-RA	Flow rate from WNWRP discharge 001. Indicate if flow is coming from upstream of WNWRP discharge 001 in which case the flow will be >WNWRP discharge. If there is no discharge, use a qualitative measurement.
WN-R11	Qualitative estimates (Above normal, Normal, Below normal)

POMONA	
Station	Current Flow Measurements (flow units = cfs)
Pom-RA	Pomona WRP discharge.
Pom-RC	Quantitative measurements using Flow Meter (FlowTracker). If a quantitative measurement is not possible use qualitative estimates (Above normal, Normal, Below normal)
Pom-RD	Quantitative measurements using Flow Meter (FlowTracker). If a quantitative measurement is not possible use qualitative estimates (Above normal, Normal, Below normal)

SAUGUS	
Station	Current Flow Measurements (flow units = mgd)
SA-RA	Quantitative measurements using Flow Meter (Flow Tracker)
SA-RB	Saugus WRP discharge

VALENCIA	
Station	Current Flow Measurements (flow units = mgd)
VA-RC	Quantitative measurements using Flow Meter (Flow Tracker)
VA-RD	VA-RC + VAWRP discharge
VA-RE	Quantitative measurements using Flow Meter (Flow Tracker)

SAN JOSE CREEK	
Station	Current Flow Measurements (Qualitative excluding R2)
SJC-C1	Qualitative estimates (Above normal, Normal, Below normal)
SJC-C2	Qualitative estimates (Above normal, Normal, Below normal)
SJC-R2	SJC-E + SJC-W discharge (subtract 1 hour & 45 minutes from the sampling time when requesting flow)
SJC-R10	Qualitative estimates (Above normal, Normal, Below normal)
SJC-R11	Qualitative estimates (Above normal, Normal, Below normal)
SJC-R12	Qualitative estimates (Above normal, Normal, Below normal)

*100-ft locations ("B locations") are calculated the same way as the compliance location except WN-RDB, which uses Whittier Narrows WRP discharge.

Appendix 2:

Sampling Equipment Checklists

Sampling Checklist for River Surveys

SGR Survey	
Log-in/Observation Sheet	Digital Camera
Sample Bottles	Keys (SGR)
Acid Vials	Cell Phone
Stainless Steel Bucket	PH Meter (calibrated)
Sampling Pump	DO Meter (calibrated)
Battery (2)	Chlorine Residual Kit
Portable Pump (boat)	Refractometer (calibrated)
Waders	Thermometers
Coolers with Ice	Inflatable Boat
Tape Measure	Boat Kit - Rope
Gloves	- Air Pump
Full Tank of Gas	- Anchor
Food/Money	Life Vests (2)
Bomb samplers (~5)	Sharpies/Pens
Ropes for bomb samplers (2)	
Weight for bomb samplers	
Safety Vest for bridges	

SCR Survey	
Log-in /Observation Sheet	Digital Camera
Sample Bottles	Keys (Green monster)
Acid Vials	Cell Phone
Stainless Steel Bucket	PH Meter (calibrated)
Sigma samplers (2)	DO Meter (calibrated)
Sigma Battery (2)	Chlorine Residual Kit
Sigma sampler tubing (2)	Full Tank of Gas
Sigma sampler pickle jars (2)	Food/Money
Thermometer	Waders
Flow Meter	Tag line for flow meter
Backpacks (not required)	Sharpies/Pens

Rio Hondo/SJC River Survey	
Log-in /Observation Sheet	Digital Camera
CI Residual Sheet (Wed. only)	Cell Phone
Acid Vials	PH Meter (calibrated)
Stainless Steel Bucket	DO Meter (calibrated)
Tape Measure	Chlorine Residual Kit
Sample bottles	Keys (R12/SGR)
Stop Watch	Gloves
Waders	Sharpies/Pens
Thermometer	Full Tank of Gas
Coolers with Ice	Food/Money

Pomona River Survey	
Log-in /Observation Sheet	Digital Camera
Stainless Steel Bucket	Cell Phone
Gloves	Keys (SGR)
Waders	Chlorine Residual Kit
Coolers with Ice	Full Tank of Gas
Thermometer	Food/Money
Sharpies/Pens	
Flow Meter	
Acid Vials	
Sampling Pump	
Battery (2) for sampling pump	

Last Update: 2/10/2010

CH/DH SAMPLING SUPPLY LIST

All Stations

Battery for Sigma sampler

Sample bottles

1L pre-cleaned and double-bagged for

- Stations RA2, R6, R7 & R8
- Duplicate sample
- Field Blank
- Equipment blank

500mL plastic bottle for

- Stations RA2, R6, R7 & R8

Pre-cleaned & double-bagged sampler tubing (6' and 8' lengths)

Latex gloves

Plastic zip-lock bags for ice

Cooler for sample bottles

Cooler for latex gloves

Cooler for bagged Ice and sample Bottles

Pliers/wire cutters

Zip ties

RA-2

RC Boat

Remote control

Boat rope

Boat battery

Wire connectors for boat battery

Bungee cords (tie-downs)

Sigma sampler head unit for boat

Foam for holding sample bottle

Waders

R6, R7 & R8

CH/DH Sigma sampler w/ foam inserts

Cored rubber stopper for holding sampler tubing

Marked rope for finding mid-depth

Lead weight for finding mid-depth

Weight for sampler tubing

Pulley w/ cables and hooks

Rope for lowering Sigma sampler

ABS (black) pipe for bridge railing

Work gloves for handling rope

Appendix 3:

Steps to Take After Rainfall & LIMS Profile Reference

Steps to Take After Rainfall

Significant rainfall is considered a tenth of an inch, although a better way to judge whether there was significant rainfall is to determine if the rain caused runoff. To determine if the rainfall was significant there are several things to consider that can help you make the decision including checking weather websites, talking to operations, talking to staff who live in the area in question, talking to sample receiving, or visiting the river in question to observe unusual conditions. It is basically a judgment call. If the rain is significant, all receiving water sampling in the river should be canceled for at least 48 hours of storm runoff.

- 1.) Check various websites to get rainfall estimates. Not all websites will list precipitation levels (NOAA/Weather.com). Check Weather Underground and Accu Weather for precipitation estimates. The precipitation levels will be based on the levels at closest gauging station.
 - a. www.accuweather.com
 - b. www.weatherunderground.com
- 2.) Call Sharon at extension 3500. She can find out the precipitation level at the WRPs. If she isn't available, call and talk to an operator at the nearest WRP to see if they can give you the rainfall that was recorded. Feel free to ask the person if they consider the rain significant and ask about the conditions in the river (especially if the Santa Clara River is in question).
- 3.) Talk to staff living in the area where the rainfall occurred. Often times they can tell you whether it was enough rainfall to cause storm runoff.
- 4.) Check out the conditions in the river in question (mainly applies to local rivers). Drive to San Jose Creek and make observations of unusual conditions including increase flow, discoloration of surface water, etc.

Biology Group LIMS Profiles

JWPCP

1. WRP Bioassays- **649**

Lancaster

1. WRP Bioassays- **509**
2. Receiving Water Bioassays- **588**

Long Beach

1. WRP Bioassays- **641**
2. Receiving Water Bioassays- **108**
3. River Runs- **98**

Los Coyotes

1. WRP Bioassays- **642**
2. Receiving Water Bioassays- **485**
3. River Runs- **289**

Pomona

1. WRP Chronic Bioassays- **643**
2. WRP Acute Bioassays- **392**
3. Receiving Water Bioassays- **296**
4. River Runs- **380**

SJC

1. SJC East WRP Chronic Bioassays- **645**
2. SJC East WRP Acute Bioassays- **285**
3. SJC West WRP Chronic Bioassays- **644**
4. SJC West WRP Acute Bioassays- **286**
5. Receiving Water Bioassays- **297**
6. River Runs- **479**

Saugus

1. WRP Chronic Bioassays- **646**
2. WRP Acute Bioassays- **410**
3. Receiving Water Bioassays- **299**
4. River Runs- **331**

Valencia

1. WRP Chronic Bioassays- **647**
2. WRP Acute Bioassays- **69**
3. Receiving Water Bioassays- **109**
4. River Runs- **494**

Whittier Narrows

1. WRP Chronic Bioassays- **648**
2. WRP Acute Bioassays- **586**
3. Receiving Water Bioassays- **493**
4. River Runs- **298**

Biology QA

1. SJC Biology Group QA Program- **766**
 - a. Includes Hard Dilution Water submittals, copper stock, zinc stock, etc.)

