

***CCWD
SAFE PRACTICES HANDBOOK
2011-12***



CCWD SAFE PRACTICES HANDBOOK

Contra Costa Water District's (District's) goal is to provide every employee with the benefits of a safe and healthy work environment. The District is committed to maintain a workplace free from work-related injuries and illnesses, and to comply with applicable laws and regulations governing workplace safety.

To help achieve these goals, the District has developed a Safe Practices Handbook. The safe practices outlined in this handbook as well as the cross-referenced safety manuals and Administrative Procedures are intended to foster a safe and healthy work environment.

It is the responsibility of every District employee to work together to identify and eliminate conditions and practices that reduce the benefits of a safe and healthy work environment. Every employee shall report unsafe work conditions, practices, or policies by communicating to their respective Site Safety Committee Members, District Safety Committee Members and/or immediate supervisor.

The District's Health and Safety Program's objectives are to:

- maximize the safety of employees and the general public
- establish safety as a priority in conjunction with efficiency and productivity
- maintain a safe and healthy work environment as free as possible from threat of injury or illness due to unsafe practices or conditions
- provide appropriate safety training programs for employees
- comply with all federal, state, city, and District safety requirements and guidelines, to follow industry practices and, where necessary, to implement additional policies to ensure the safety of District employees

CONTRA COSTA WATER DISTRICT
Interoffice Memorandum

DATE: January 28, 2011

TO: All Employees

FROM: Jerry Brown



SUBJECT: Safety Commitment

I am committed to creating a world-class safety culture here at the District. The foundation of such a culture must include mutual trust and respect. This organization needs to continue developing our workplace culture so every employee feels comfortable bringing up safety concerns and suggestions with confidence those concerns will be addressed. To achieve this:

1. Giving safety feedback is all about caring for people, not criticizing people. Ensure your care and concern comes through in your communication. Likewise, don't react defensively when receiving constructive safety feedback. Welcome the opportunity to learn and grow. Recognize that the person providing you with that feedback is looking out for you.
2. Hold each other accountable and be persistent in communicating valid safety concerns and constructive suggestions. If the concerns are not reviewed adequately or not acted upon timely or responsibly, continue raising the issue through other channels, such as the Safety Committees, the Safety Officer or a higher level of management.
3. Managers, supervisors and other workplace leaders must be committed to listening and being open, receptive to concerns and suggestions raised by employees; following through on every concern and suggestion to closure.
4. The District will continue to expend resources to improve treatment plants, pump stations, reservoirs, canal facilities and office space to ensure our work places continue to be safe for employees and the public. The District also will continue to dedicate labor resources to support the District Safety Program and Safety Committees.

My vision is for our organization to have an injury and severity rating of zero, meaning employees would not suffer workplace accidents and there would be no lost-time injuries. The ability to make this vision a reality rests on the commitment of each and every one of us to work safely and look out for one another. I welcome your ideas and suggestions on how we can continue to work together towards our common goal of achieving a world-class safety culture at the District.

JB/sz:kc

Please keep this handbook with you at your place of work or in your District-assigned vehicle.

Table of Contents

<u>Safe Practices</u>	<u>Page</u>
General Safety Practices	5
Driving Safety	7
Electrical Safety	9
Fire Safety	11
Hand Tools	13
Ladder Safety	14
Office Safety	16
Personal Protective Equipment (Head, Eye, Face, Hand, and Hearing)	17
Site Safety and Security	20
Construction and Operations & Maintenance Work	22
Excavation Work	22
Tools & Equipment	22
Traffic Safety	26
Canal and Grounds Maintenance	29
Plant Operations & Maintenance	29
Welding, Cutting and Other Hot Work	31
Boating Safety	33
Confined Spaces	34
Fall Protection	35
Lock and Tag	36
Safety Feedback	38
Safety Committees	39

The following are safe practices that shall be followed by all CCWD employees. These safe practices coincide with and/or augment other safety procedures found in CCWD Administrative Procedures, Standard Operating Procedures and the Safety & Health Manual.

GENERAL SAFETY PRACTICES

All District employees shall follow these general safety practices:

1. Any employee may stop District work without fear of retaliation if he/she believes the task must be evaluated to determine necessary safety precautions.

Any employee should communicate safety concerns directly to the employee in-charge of the work activity or the contractor's employee/ foreman. If the concern is not resolved or there is disagreement, communicate the concern to your supervisor and/or the supervisor in-charge of the work. In the case of outside contractors, the construction inspector or contract administrator should be contacted.

The concern may also be communicated to a safety committee member instead of your supervisor. The Safety Committee member is responsible for reporting the concern to the employee's supervisor and will act as the point between the supervisor and the employee, keeping the employee informed as to the status and follow-up actions.

Supervisors must try to resolve safety concerns at their level, using the Safety Officer as a resource. If the concern is not resolved at the Supervisor level, the concern should be brought up to a higher authority such as a Superintendent or Division Manager. The Division Manager, Superintendent and/or the Supervisor shall keep the employee and/or the Safety Committee member informed as to the status of the item and follow-up actions.

While communicating through the "chain-of-command" is recommended, District staff may freely communicate safety concerns between any level and department.

2. Keep your work area clean and orderly at all times to prevent slips, trips or falls.
3. Do not climb over fences or walls 4 feet or more in height without appropriate climbing equipment. When possible, avoid uneven ground and keep your eyes on your path.
4. Only use equipment and machines on which you have been authorized to operate. Supervisors ensure that employees are trained to operate appropriate equipment and machines.
5. Bend your knees and use your legs to lift, push or pull objects. Seek help of others if needed. Use tools to help lift heavy objects. When possible, use tools instead of hands to lift meter box lids. Use tools, the steel-toe of your shoe or the instep of your foot to slide lids back in place. (See the Construction and O & M section for more lifting work practices.)
6. Wear all personal protective equipment (PPE) appropriate for the work area. (See PPE section)
7. Use stairs, ladders or ramps to climb up or down work surfaces 4 feet or more in height or depth.
8. Ensure there is adequate lighting to perform the job safely. Use a flashlight when walking in dark areas.
9. Use only those hazardous chemical containers that have appropriate labeling (name and hazard warning). Label all containers immediately after hazardous chemicals are placed inside them or when the containers' labels have been removed or defaced. Properly dispose of waste chemicals.
10. Report immediately to your supervisor:
 - a. On-the-job injuries or illnesses. If experiencing symptoms of heat illness (fatigue, headache, dizziness, nausea, cramps, hot/dry skin, and rapid pulse), seek shade in an area of open air or an air conditioned vehicle.

- b. Hazards, unsafe practices, malfunctioning equipment or tools, defective personal protective equipment, or policies and procedures that you believe could create or result in a dangerous situation.
 - c. Near misses. A near miss is a condition or an incident where if not for a fortunate break in the chain of events, there is near certainty that an injury or property damage would have occurred. District employees can learn from near misses and potentially identify needs for changes in work procedures, additional training or equipment that would minimize potential re-occurrence.
11. Keep your supervisor informed of your work location, schedule, and type of work.
12. Supervisors are required to notify their field employees of forecasted temperatures 85 degrees and above at the start of the work shift, and ask them to use caution (drink up to one quart of water per hour and seek shade for at least five minutes when experiencing symptoms of heat illness: fatigue, headache, dizziness, nausea, cramps, hot/dry skin, and rapid pulse). Supervisors must ensure that shade and water is available near the work area (within a ¼ mile or 5 minute walk) at all times. When forecasted temperatures exceed 105 degrees, supervisors must schedule strenuous work activities during cooler times of the day, except for emergency job tasks that are necessary to be completed to avoid major service disruptions or impacts to public safety.
13. Apply sunscreen when working in the sun for long periods.
14. If you are serving or performing duties as a CCWD contract administrator for contractors (non-CCWD employees) involved with construction, maintenance or repair work, or any work near water (reservoirs and canals) or in confined spaces, ensure that:
- a. Safety concerns are identified and communicated to the contractor representative.
 - b. Special CCWD site procedures are communicated to the contractor representative, including the Contractor (or Consultant) Safe Practices Handbook.
 - c. Your safety-related communications with the contractor are documented.
 - d. Pertinent written contractor safety plans, programs, and information are obtained before the start of work (written programs on confined space entry, lockout/tagout, hot work, diving safety, fall protection, and/or respiratory protection are required)
 - e. Contractors have current safety certifications or licenses when required. (i.e., large mobile crane operation and asbestos abatement).
 - f. Contractors are informed to use their own ladders, locks/tags, harnesses, and confined space gas monitors and rescue equipment as needed.
 - g. Contractors conduct at least one tailgate meeting per week.

Original Date: June 14, 2006
Revised Date: September 23, 2011

DRIVING SAFETY

While driving on CCWD business, all employees shall:

1. Ensure you have the following with you prior to driving:
 - a. A valid driver's license for the type of vehicle you are driving, vehicle registration form, and proof of vehicle insurance.
 - b. A complete vehicle accident kit, first-aid kit, and fire extinguisher (for District vehicles only). If any of these items are missing, contact the Safety Officer for assistance.
2. Conduct a safety check prior to driving the vehicle:
 - a. Walk around the vehicle to check its condition including the tires. Check for possible obstructions around the vehicle. Document your inspection when required.
 - b. Be sure you have good visibility all around. Adjust side and rear view mirrors.
3. Designate a spotter when available to assist in directing you while backing your vehicle. Maintain eye contact while moving. Stop if you lose sight of the spotter's signals. Ensure that all heavy equipment vehicles (Class A and B vehicles and tractors) have functional automatic backup warning devices.
4. Ensure that you and your passengers have your safety belts fastened while driving at all times.
5. Park all vehicles in compliance with the California Vehicle Code and local ordinances. Follow the "*California Manual on Uniform Traffic Control Devices*" whenever work is performed in and adjacent to vehicle traffic.
<http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/pdf/camutcd/CAMUTCD-Part6.pdf>
Park District vehicles out of vehicle and pedestrian traffic except when vehicle placement is determined by job requirements (e.g., excavation work in street, valve exercising, etc.).
6. Set all brakes when departing the vehicle. For operators of trucks, equipment, and vans with cargo weight of 1 ton or more, set one safety cone at the rear corner nearest to the flow of traffic and place one wheel chock on the downhill side of one of the drive wheels.
7. Secure tools and similar loose equipment to prevent them from becoming flying objects. Secure heavy equipment and vehicles loaded on a trailer prior to transport.
8. Secure non-automated facility gates so they do not swing back into your vehicle's path.
9. While your vehicle is in motion, only cell phones with a hands-free device may be used. Cell phone usage while driving should be kept to an absolute minimum. You should pull over to a safe location when using the cell phone:
 - a. for District business when the call duration of the conversation exceeds more than two minutes.
 - b. if required to receive a personal call while driving a District vehicle or while driving on District business. Personal calls should only be made while on scheduled breaks and meal periods.

Text messaging or use of PDA's (Blackberry devices) is prohibited while driving.
10. In the event of a motor vehicle accident, follow the directions in the vehicle accident kit, contact the police and report the accident to your supervisor immediately, regardless of the level of damage or whether or not an injury is involved.
11. Do not drive a motor vehicle or operate heavy machinery if you are under the influence of drugs or alcohol.
12. Port Costa: Use caution when driving on McEwen Rd on route to Port Costa. When driving Class A or B vehicles, use Cummings Skwy exit as only approved access, right on Crockett

Blvd, right on Pomona St (turns into Carquinez Scenic Dr – go slow around curves and through narrow parts of the road).

13. Old River and Middle River Intakes: During foggy conditions, make a right turn when exiting the driveways, then turn around at a safe location.
14. Do not overload your vehicle above its rated capacity.
15. Know loading restrictions (review signage) on reservoir roofs to avoid overloading the roofs with the weight of vehicles.

Original Date: June 14, 2006
Revised Date: September 23, 2011

ELECTRICAL SAFETY

Follow these electrical safety rules:

1. Check equipment, cords and attachments before each use to ensure they are safe to use and operate. Protect cords from damage. Remove damaged electrical equipment from service.
2. Ensure metal-encased equipment is properly grounded and plugged into grounded circuits when used. Do not use equipment that has the 3rd (ground) prong removed.
3. Use lockout/tagout procedures to ensure that power is completely off during maintenance and repairs of hard-wired equipment. *Exception: electrical troubleshooting performed by electrical or instrument technicians that are considered to be qualified electrical workers.* Confirm de-energization before handling non-insulated wiring.
4. Stay clear of energized parts whenever possible. If you must work with or near energized parts with voltages exceeding 50 Volts (i.e., electrical troubleshooting):
 - a. Use protective equipment such as flame retardant clothing, face shields, rubber insulating gloves, sleeves, hard hats, blankets, mats and non-conducting tools. Follow the CCWD Safety & Health Manual's Personal Protective Equipment Program Appendices J, K & L (see the Safety Website under Safety Library).
 - b. Do not wear metallic jewelry including watches.
 - c. Follow arc flash warning label requirements. Wear appropriate PPE or maintain a safe distance from live electrical parts. Where arc flash labels do not exist, stay at least 10 feet away from where live low voltage (480 V and less) electrical work is being conducted unless you are wearing the appropriate personal protective equipment. Stay outside of the motor control center area (building or room) where live high voltage (more than 480 V) electrical work is being conducted unless you are wearing the appropriate personal protective equipment. Use barricade tape or signs to warn unprotected persons to keep away from the live electrical work area.
 - d. Do not use two hands when handling energized parts.
5. Ensure rated protective equipment such as gloves and hot sticks have been tested within the last 6 months before use.
6. Re-install equipment guards that protect electrical equipment after work is completed.
7. Keep electrical panel doors on and closed. Keep access to electrical panels clear with at least a 36" clearance. Do not use motor control center rooms as storage areas.
8. Use equipment designed for use in damp environments when exposed to such environments. All electrical equipment in these areas must be grounded.
9. Use ground fault circuit interrupters (GFCIs) when using electrically-powered tools and equipment during construction and maintenance activities.
10. To prevent fire hazard, never install extension cords in a permanent fashion, or inside ceilings, floors, or walls. Use extension cords only for temporary purposes, and disconnect them when not in use.
11. Only persons who are trained and authorized shall access electrical panels and equipment.
12. Electrical panels may occasionally become energized and place workers and others in danger. Energizing may occur as a result of electrical maintenance, theft of equipment, and

equipment failure. Before accessing electrical panels, take safe and appropriate actions to check the panel enclosure for hazardous voltage prior to opening.

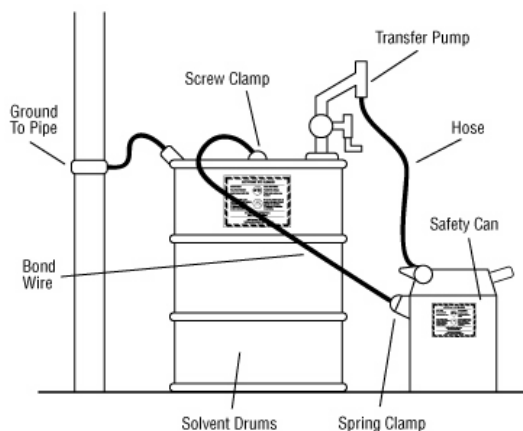
13. Persistent stray electrical current on the Taylor Blvd main presents electrical shock hazards to those contacting the pipeline. The main may be electrified up to 28 volts. As a precaution, notify Corrosion Control prior working on the pipe. Corrosion Control personnel will lower the voltage by implementing grounding as necessary. Wear dry gloves and boots and keep the excavation dry to minimize the shock hazard.
14. Electrical system deficiencies on buildings may cause metallic service lines to become neutral conductors. When removing and installing meters, the neutral conductor may be interrupted or connected causing arcing between the building service line and the main service line. Electrical shocks can occur if a worker contacts both sides of a service with the meter removed, or the service side of the meter while being well grounded in wet conditions. Meter personnel shall check metallic water service connections with an electric test device and if necessary, connect a bond cable between the service line and the main line prior to removing a meter to minimize the hazard. Working dry also minimizes the hazard. If voltages exceed 50 volts, and the electrical hazard cannot be eliminated, wear electrically insulated gloves.

Original Date: June 14, 2006
Revised Date: September 23, 2011

FIRE SAFETY

Follow these fire safety rules:

1. Ensure good housekeeping is maintained, keeping work areas clean and free of debris.
2. Store flammable materials in approved safety cans and/or cabinets. Keep large amounts (more than 10 gallons of flammable liquid) in a flammable liquids cabinet.
 - a. Keep smoking, flames/sparks, and other ignition sources at least 35 feet away from areas where flammable fuel is dispensed.
 - b. To prevent the build up of static electricity and prevent sparks from causing a fire, bond dispensing and receiving containers together before dispensing flammable liquid. Additionally, ensure the dispensing container is grounded.
 - c. Report all fires.



3. Operate and maintain all electrical circuits so they do not become overloaded.
4. Use only electric space heaters that have:
 - a. A safety device that shuts the unit off if the device topples over or overheats.
 - b. Adequate power supply circuitry to handle the space heater's electrical needs.
5. Keep fire exits and escape routes clear and well marked.
6. Know the evacuation routes from your work area. Know where alarm boxes are located.
7. Secure propane heaters to prevent them from tipping over. Remove the torch from propane cylinders prior to storage.
8. Maintain a fire watch when open flames, sparks, or smoke are present.
 - a. Keep a fire extinguisher available when welding/cutting, grinding or conducting other hot work.
 - b. If grinding or welding near dry vegetation, always wet down the vegetation at least 35 feet around and 75 feet downwind of the work site. (See Welding, Cutting and Other Hot Work section.) Do not grind or weld near dry vegetation when wind speeds exceed 10 MPH and humidity is less than 20%. If unsure about weather conditions, check weather on-line or contact your supervisor.
 - c. Maintain a fire watch for 30 minutes after hot work or weed abatement activities are completed at areas with a high wildfire risk.
 - d. Whenever possible in areas with a high wildfire risk, avoid driving on tall grass to prevent fires caused by hot catalytic converters.
9. Obtain a hot work permit from your supervisor before performing hot work outside of maintenance shops at CCWD facilities (office buildings/areas, pump stations/plants, and treatment plants). Maintain a fire watch for 60 minutes after hot work is completed under

a permit. Re-check the work area three hours after hot work is completed under a permit.

To use an extinguisher safely, stand 6 to 8 feet from the fire with your back to an unblocked exit and use the PASS procedure:

Pull the safety pin at the top of the extinguisher.

Aim the nozzle or horn at the base of the flames.

Squeeze or press the handle to release the extinguishing agent.

Sweep from side to side at the base of the fire and at least 6 inches past the edges of the flames until completely extinguished.

- Before fighting a fire, be certain that co-workers have been alerted to the fire and are leaving the building/area, and that the fire department has been called (9-1-1).
- Fight the fire only if the fire is small and contained, a correct type of extinguisher is within easy reach, and you are near a clear exit in case you need to escape. Do not attempt to extinguish a fire that produces flame lengths of 4 feet or more unless you are supervised by trained emergency personnel, are wearing all your required fire fighting PPE and have been adequately trained to extinguish large fires. If you do not feel safe or comfortable fighting fires, you may refuse the assignment
- Never put water on electrical equipment or oil/grease fires.

Original Date: June 14, 2006
Revised Date: September 23, 2011

HAND TOOLS

All employees shall follow these hand tool safety rules:

1. Basic Rules
 - a. Select the right tool for the job.
 - b. Inspect the tool and ensure the tool is in good condition.
 - c. Use the tool in the way it was designed.
 - d. Use tools in a professional manner.
 - e. After use, store the tool in a secure, safe location.
 - f. Maintain tool in ready condition for the next job.
2. Handsaws
 - a. Ensure all saws are sharp and properly set.
 - b. Select the proper saw for the material being cut.
 - c. Move the saw in a straight line, without twisting or binding.
 - d. Hold the material being cut firmly so that it will not bind or stick. Clamp the work piece if possible.
3. Hammers
 - a. Select the correct hammer for the job; only soft hammers shall be used to drive hardened drills or chisels.
 - b. Hammer handles must fit tightly, and not have any cracks or splinters.
 - c. Grip the hammer handle near the end; do not choke up your grip on the handle.
 - d. Look at the object to be struck when delivering the blow, to avoid hitting hands or fingers. Do not place hands near the intended point of impact.
4. Punches, Drills and Chisels
 - a. Grind flat the ends of struck tools with mushroomed heads such as cold chisels, star drills, and punches.
 - b. Grind or file a small radius around the edge of the striking surface to reduce spalling and subsequent danger of flying steel chips.
5. Keep cutting edges sharp. Replace worn out tools (e.g., screwdrivers with rounded blades).

Original Date: June 14, 2006
Revised Date: September 23, 2010

LADDER SAFETY

All employees shall follow these ladder safety rules:

1. Select the right ladder for the job.
 - a) The ladder shall be tall enough so that you can reach the required objects without standing on the top or second-to-the-top rung/step of the ladder or putting the ladder on some other object to reach the required objects.
 - b) The ladder shall be made of a material that is appropriate for the work to be performed. Do not use metal (electrically conductive) ladders when working around or with electrical equipment.
2. Use ladders for only their intended purpose, i.e., climbing up and down.
3. Maintain ladders in good condition. Ladders in disrepair shall be either disposed or fixed.
4. Before climbing any ladder, check its condition:
 - 1) Nuts and bolts tight?
 - 2) Rungs secure?
 - 3) Spreaders working?
 - 4) Safety feet working right?
5. Always face the ladder when ascending or descending, holding on to the rungs with both hands. (Maintain a three-point contact at all times).
6. While working, hold on to the ladder with one hand.
7. Use a tool belt or a bucket attached to a hand line to transport tools.
8. Only one person climbs a ladder at a time to prevent overloading the ladder and objects falling down on another.
9. The trunk of your body shall not extend past the side of the ladder. Move the ladder if you have to reach outside of this area.
10. Wear slip-resistant footwear.
11. Keep the ladder rungs free of oil and grease.
12. Step Ladders
 - a. Make sure the spreaders are locked open before climbing.
 - b. Place a ladder only where it is safe to do so. For example, it is not safe to put a ladder in front of doors opening toward the ladder unless the door is blocked open, locked or guarded.
 - c. Do not climb above second rung from the top.
13. Straight/Extension Ladders
 - a. Use the 4 to 1 rule. Position the base of the ladder one foot out from the wall for every four feet of the ladder's height up to the support point. For example, the base of a 16-foot ladder must be 4 feet out from the wall.
 - b. Place the base of the ladder so that the ladder will not slip.
 - c. Ensure that the ladder extends at least 3 feet above the elevated surface to which you are climbing.
 - d. Secure the ladder at the top to hold it in place. Have a second person hold the ladder in place when ascending or descending until the ladder is secured.
 - e. Adjust extension ladders while standing at the base, not while standing on the ladder or from a position above the ladder.
 - f. Keep at or below the third rung from the top on a straight ladder.

14. Fixed Ladders

- a. Use a ladder climbing safety device (LAD-SAF®) when climbing fixed tank ladders that have the device installed. Attach a lanyard to the top of the climbing device before unhooking the sleeve to ensure 100% fall protection. (Note: a ladder climbing device must be in place for all fixed ladders taller than 20 feet without a cage, or 30 feet with a cage).
- b. To prevent injury, do not intentionally engage the ladder climbing device.

Original Date: June 14, 2006
Revised Date: September 23, 2011

OFFICE SAFETY

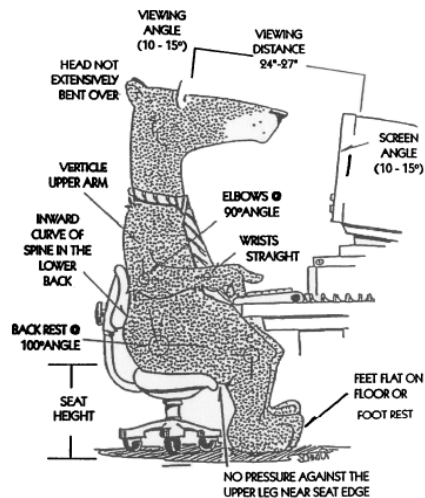
1. Use caution when using stairs; hold on to handrails as you descend or ascend.
2. Open doors slowly, other people may be on the other side of doors as you enter or leave.
3. Keep your eyes on your path as you walk. Be aware of the hazards around you, and eliminate or avoid them.
4. Maintain an orderly and clean work environment at all times:
 - a. Keep desk and file cabinet drawers closed when unattended.
 - b. Keep materials out of pathways. If cords cannot be kept out of pathways, they must be secured so they do not become tripping hazards.
 - c. Clean up spills. Dispose of food and drink after use to keep pests away from the office.
5. Use a hand truck or get help to lift and move heavy items.
6. Wear suitable footwear for the task (i.e., low-heeled shoes when lifting boxes).
7. Always use a stepladder for overhead reaching. Chairs should never be used as ladders.
8. Ensure filing cabinets and book shelves in your office over 5 feet tall are secured.
9. At your work station:
 - a. Make sure your lower back is supported; do not slouch in your chair.
 - b. Keep wrists straight (in-line with forearms) when using your keyboard and mouse.
 - c. Keep feet flat on the floor or on a foot rest.
 - d. Set the top of your monitor at or just below eye level.
 - e. Avoid bending your head extensively.
 - f. Avoid cradling the telephone between the head and shoulder. Hold the phone with your hand, use the speaker phone, or a headset.
 - g. Avoid excessive bending, twisting, and leaning backward while seated.
 - h. Request an ergonomic evaluation after a change to your workstation.

Original Date: June 14, 2006
Revised Date: August 28, 2009

WRONG



RIGHT



PERSONAL PROTECTIVE EQUIPMENT

(PPE) HEAD, EYE, FACE, HAND, FOOT, BODY and HEARING

All employees shall follow these rules for personal protective equipment:

Head: Hard hats are to be worn at all times when the following conditions are present:

1. At work sites where construction and/or maintenance activities are conducted
2. When working or walking in a traffic way
3. At treatment plant process areas
4. At pump stations/plants
5. In areas where indicated by posted signs
6. Where heavy materials are being moved onto and off of storage racks
7. When entering confined spaces
8. When heavy equipment or powered tools are in use

Wearing of hard hats is not required during the following activities:

- a. Meter and backflow device work, water sampling and reservoir chlorination activities unless working on a public street, in the immediate area of construction maintenance activities, on construction sites, or where powered tools are used
- b. Maintenance work in occupied office areas and grounds maintenance duties where powered tools or equipment are not used and no overhead work is being performed
- c. Field customer service work not in the immediate area of construction or maintenance activities
- d. Wearing of face shields that interfere with the wearing of hard hats
- e. Work in maintenance shops when cranes are not in use or when not working on energized electrical parts/ systems
- f. Operation of motorized equipment with overhead protection
- g. Minor vehicle maintenance at corporate yards
- h. Walking to and from the parking areas in front of the treatment plants unless a hazardous condition is present. Also, walking to and from the parking areas in the rear of the plants upon arrival to work at beginning of a shift and upon departure at the end of the shift unless a hazardous condition is present.
- i. Whenever wearing of hard hats is a hindrance to performing work and where powered tools or equipment are not used and no overhead work is being performed.

No ball caps are allowed to be worn underneath hard hats.

Full face helmets shall be worn when riding all-terrain vehicles (ATVs). Full or half-shell helmets are worn when operating utility terrain vehicles (UTVs). Hard hats may be worn in lieu of helmets only when riding UTVs on "flat" surfaces (less than 5 degree slope). While operating UTVs, seat belts are worn at all times.

Eye/Face

1. Wear the appropriate (ANSI Z87 rated) eye and face protection when you are engaged in metalworking activities, welding and cutting, using powered tools or otherwise exposed to flying particles/objects, injurious light rays, liquid chemicals, or hazardous gases.
2. Eye/Face protection is required to be worn at treatment plant chemical process areas, pump stations/plants, laboratories, maintenance shops, and when hazardous chemicals are being used.
3. Full-face splash shields with safety glasses put on underneath, chemical splash goggles, or full-face respirators are required to be worn during pump catches at chemical feed or bulk storage areas, in immediate areas (within 6 feet or inside bermed secondary containment areas) where corrosive chemicals are off-loaded, handled, or leaking from process lines, or where corrosive chemical line breaking activities are conducted. (Corrosive chemicals have a pH of 0 to 3.5, or 11.0 to 14.) Consult individual chemical Material Safety Data

Sheets (MSDSs) for additional details regarding chemical handling and safety, chemical interactions, and PPE requirements.

4. Eye/face protection is required in the immediate areas where construction and maintenance activities are being performed except during operation of motorized equipment while inside an enclosed cab.
5. Wear eye protection in areas where indicated by posted signs.
6. Always keep your safety eye protection equipment in good repair, replacing if scratched or cracked. Keep lenses clean.
7. If an eye becomes irritated in the course of work, do not rub the eye. Use appropriate eye wash as first aid.
8. Wear side shields with your prescription safety glasses where eye protection is required.
9. When near welding or cutting operations, wear approved safety goggles or welding helmets. Spectacle type safety eyeglasses shall not be used as a substitute for approved cutting goggles.

The following is a guide for the selection of the proper shade numbers:

<u>Welding Operation</u>	<u>Shade No.</u>
Shielded metal-arc welding: 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	10
Gas-shielded arc welding (nonferrous): 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	11
Gas-shielded arc welding (ferrous): 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	12
Shielded metal-arc welding: 3/16-, 7/32-, 1/4-inch electrodes	12
5/16-, 3/8-inch electrodes	14
Atomic hydrogen welding	10-14
Carbon arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, 6 inches and over	5 or 6
Gas welding (light) up to 1/8 inch	4 or 5
Gas welding (medium) 1/8 inch to 1/2 inch	5 or 6
Gas welding (heavy) 1/2 inch and over	6 or 8

Note: In gas welding or oxygen cutting where the torch produces a high yellow light, it is desirable to use a filter or lens that absorbs the yellow or sodium line in the visible light of the operation.

Hand and Arm

Wear appropriate protective gloves when you may be exposed to abrasions, hazardous substances, burns, cuts, punctures, live electricity, or other hazards. When welding, wear protective leather gauntlet gloves or leather gloves and sleeves. See the Construction and O&M section for more information on chemical resistant gloves.

Foot

1. Wear safety shoes/boots with toe protection that complies with ASTM F 2413-05, ASTM F2412-05, and/or ANSI Z-41 when exposed to the risk of foot injuries from hot material,

corrosive substances, falling objects, and crushing or penetrating activities. Safety shoes/boots are required to be worn at all construction and maintenance worksites. When applicable, employees shall follow union contract (Memorandum of Understanding) requirements to wear safety shoes/boots during all working hours. *Exception: Fire boots used at Los Vaqueros Watershed need not have steel-toe protection.*

2. Wear metatarsal (total foot) protection when using a jackhammer.

Body and Leg

1. Wear chemical-resistant suits, coveralls or aprons, when working with bulk chemicals or performing line-breaking operations where chemical exposure to the torso is possible.
2. Wear approved personal floatation devices (PFDs, USCG rated as Type I, II, or III) to control drowning hazards when inside the canal liner fence, near or over areas where water depths may exceed 4 feet, in areas where indicated by posted signs, or as directed by your supervisor. PFDs do not need to be worn when other protective measures are in place, such as:
 - a. Keeping a horizontal distance of more than 6 feet from the drowning hazard.
 - b. Using a fall prevention equipment system (anchor point, harness and connection device) that effectively prevents a fall into the water.
 - c. Working behind a proper guardrail or equivalent barrier that is at least 42 inches high.
3. Wear orange uniforms shirts/jackets, or orange or strong yellow-green vests if on foot and exposed to the hazard of vehicular traffic. During rainy weather, orange, strong yellow-green, or yellow rainwear may be worn. During hours of darkness and/or on roads with a speed limit of 45 MPH or above, wear shirts or jackets with retro-reflective stripes on the torso and on each sleeve (rated Class 3 by ANSI 107-2004).
4. Wear appropriate clothing that conforms with Cal-OSHA requirements to support wildlands fire fighting duties.
5. Wear leg protection (chaps) when operating chainsaws (excluding pole saws).
6. Wear leg protection (snake chaps) when working in snake-prone areas.

Hearing

Wear hearing protection when near the operation of the following equipment: pneumatic tools, concrete saws, mowers, weed eaters, leaf blowers, chainsaws, grinders, welding/cutting equipment, as well as other equipment where one must shout to be heard.

Original Date: June 14, 2006
Revised Date: September 23, 2011

SITE SAFETY AND SECURITY

1. Contact Operations Control when working outside normal business hours (Mon-Fri from 3:30 PM to 7:00 AM or weekends) immediately upon the beginning and end of your shift or service per O&M SOP 2008-04.
2. At the top of every hour, Operations Control initiates a safety check for all field CCWD employees working alone during after hours assignments. If contact is not made between Control and the employee within 30 minutes, the on-call O&M or Watershed supervisor shall be notified by Control. The supervisor shall initiate emergency procedures as per O&M SOP 2008-04.

If the employee plans to enter an area with limited communication, the employee must notify Control of their intent to travel and expected duration of limited communication. At completion of assignment, the employee shall make contact with Control so hourly safety checks can resume.

3. Emergency Medical Situations: All employees including supervisors must know how to contact emergency medical services (dial 9-1-1) and be able to provide clear and precise directions to the work site. Call 9-1-1 immediately if any employees or contractors show these warning signs:
 - a. Any signs of heat stroke. Advanced heat illness symptoms (heat stroke) include: red hot dry skin, very little sweating, and high body temperature. (Immediately immerse the victim in cool water or ice to reduce their high body temperature.)
 - b. Difficulty breathing, shortness of breath
 - c. Chest or upper abdominal pain or pressure
 - d. Loss of consciousness
 - e. Unresponsiveness when talked to or touched
 - f. Drowning
 - g. Seizures or convulsions
 - h. Sudden dizziness, weakness or change in vision
 - i. Mental change (confusion, unusual behavior, difficulty speaking)
 - j. Unexplained severe headaches
 - k. Sudden intense pain
 - l. Bleeding that won't stop
 - m. Coughing or vomiting blood
 - n. Choking
 - o. Severe burns
 - p. Allergic reaction
 - q. Severe trauma to head, neck or back
 - r. Severe fractures to arms, legs, or torso
4. Buddy System: Employees and contractors shall not work alone under the following work conditions:
 - a. Potentially hazardous atmospheres where self-contained breathing apparatus is required (a minimum of four persons)
 - b. Permit-required confined space entries
 - c. Work in excavations more than 4' deep
 - d. Excavation work when flagging is required (minimum of 4 persons)
 - e. Chainsaw operation used for tree work (excluding work using only pole saws at the District Center campus)
 - f. High voltage (> 600 volts) electrical work
 - g. Use of personal fall arrest system
 - h. Work using an extension ladder when the ladder is not secured.
 - i. Night-time work near or over water (when personal floatation devices are required)
 - j. When launching or retrieving a boat from a boat ramp

- k. Operation of the lattice or articulating (knuckleboom) crane
- l. Line breaking activities at treatment plants involving toxic or corrosive substances
- m. Work in public roadways (e.g., flagging, valve operation, etc.) with the speed limits of 30 MPH or more and when traffic control measures are needed for an anticipated time period of more than 15 minutes. A crew of a minimum of 4 persons shall be assigned to conduct excavation operations when a flagger is required.
- n. Work at Mallard Pump Station (PS)

Hourly safety checks shall be conducted by Control for work at Mallard PS, or at any time or place when requested by a supervisor. As needed, employees should request Control to call more frequently than hourly.

5. Do not, under any circumstances, loan your keys to anyone. If you have lost your keys, you must immediately report the loss to your supervisor.
6. Close gates and entry doors that will be unattended to prevent unauthorized entries.
7. Before putting your hands into a meter box or other enclosed spaces in the field, check the space for hazards such as rattlesnakes, spiders, bees or abandoned hypodermic needles. Tap on the meter box before lifting the lid. Wear gloves for added protection. Contact the Environmental Compliance Officer for guidance on disposal of hypodermic needles and syringes.
8. If a rattlesnake or other animal is found to obstruct your ability to safely perform your work, contact Contra Costa County Animal Services at 335-8300, or Los Vaqueros Watershed staff (when available) to have the snake or other animal safely removed from the worksite.
9. When entering private property, request property owners to confine their dogs away from you. If an unleashed aggressive dog approaches you, step back from the dog while maintaining eye contact and use a meter stick or similar item to help keep the dog at a safe distance from you.
10. Follow posted speed limits. The speed limit at CCWD facilities including water treatment plant roads, maintenance yards and employee parking lots is 10 MPH. At Los Vaqueros, the speed limit is 15 MPH for unpaved roads and 30 MPH for paved roads.
11. Contact Watershed supervisors before driving on unpaved Watershed roads. Watershed supervisors determine when it is safe to drive and what vehicle types may be used during, or shortly after periods of rain.
12. All employees and contractors working at the water treatment plants shall receive a safety orientation (e.g., view plant safety video). Exception: those persons visiting a single time, such as those on a plant tour or a job walkthrough while escorted by District personnel who have watched the safety video.
13. All employees not assigned to a water treatment plant or Watershed shall sign in and out on the visitor log when visiting. When groups are escorted by District personnel (school tours or facility/job walkthroughs), the escort signs the log for the group, and is responsible to ensure the group remains together and is in compliance with the plant safety video instructions.

Original Date: June 14, 2006
 Revised Date: September 23, 2011

CONSTRUCTION AND OPERATIONS & MAINTENANCE WORK

All employees shall follow these safety rules during construction and O&M work:

Pre-task plans and tailgate meetings are required to be conducted just prior to all high hazard job tasks. The job tasks covered under this procedure are set out below:

- Permit-required confined space entry;
- Maintenance tasks requiring lock-out/tag-out of more than one type of hazardous energy source;
- Line breaking tasks – Opening of equipment that may carry flammable, corrosive, or toxic material, or an inert gas or any fluid, including water, at a volume, pressure, or temperature capable of causing serious injury;
- Neutralizing large amounts of spilled corrosive substances at plant process areas;
- Use of mobile cranes with persons (other than the crane operator) on foot and in the immediate area of operation;
- High-voltage electrical work above 600 volts;
- Work using a personal fall arrest system where self-rescue after a fall is not possible;
- Prior to excavating with heavy equipment and/or working in an excavation deeper than 4 feet;
- Work in public roadways with the speed limits of 30 MPH or more and when traffic control measures are needed for a time period of more than 15 minutes;
- Chainsaw operations;
- Work over water at night;
- Launching or retrieving a boat from a boat ramp;
- Any other job task determined as highly hazardous by the lead person, or the supervisor in charge.

The tailgate meeting must cover hazards expected throughout the job task, measures to protect against those hazards, and emergency response planning. Use available safety checklists for the job task (e.g., confined space entry permit), it is completed during the meeting.

All employees involved in the high hazard job task must attend the meeting. Meeting information must be documented.

Maintenance staff shall delineate the work zone using cones, barricades, caution tape, or equivalent warning devices.

Excavation Work

1. Follow *CCWD O&M SOP Excavation Safety (2010-2)*. Conduct a tailgate meeting and complete the Excavation Pre-Task Plan Tailgate Form before starting excavation work. Verify USA markings are completed before proceeding.

When available, use approved engineering plans for construction. Contact Engineering if conflicts are identified in the field.

2. For high priority subsurface utilities (natural gas > 60 psig, high voltage electrical > 60kv, pressurized sewer, petroleum, or hazardous material) within 10 feet of the planned excavation, an onsite meeting with a representative of the utility is required to verify utility location. Document the detailed information communicated by the representative.

Question any inconsistent or potentially incorrect utility markings/identifications with the utility representative and inform your supervisor. Stop work until the marking concern is resolved.

3. Install adequate shoring, or bench or slope excavations that have either poor soil conditions or depths in excess of 5 feet (60 inches measured from the deepest point) prior to work in the excavations. When using shoring equipment to prevent excavation walls from caving-in, follow the shoring manufacturer's tabulated data sheets. Manufacturer's tabulated data









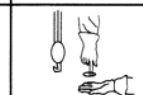

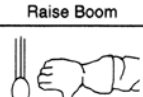
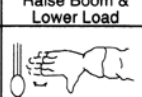
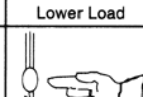


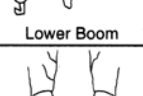
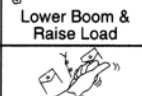
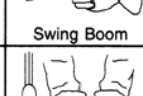
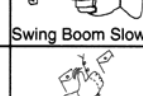
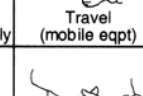
must be available on the job site for the type of shoring used to ensure proper use and compliance with the manufacturer's requirements at all times.

4. Only enter an excavation under the direction of a trained, competent person. A competent person shall constantly monitor an excavation occupied by workers and be ready to stop work when unsafe conditions arise.
5. Demarcate undermined perimeters of excavations with marking paint as a hazard warning.
6. Obtain supervisor approval of all excavation work where sloping and/or benching is used in lieu of shoring or trench shields/boxes. Simple slope excavations (Type B Soil, granular cohesion-less soil such as crushed rock, unstable rock, silt, sandy loam, or previously disturbed soil) shall have a maximum allowable slope of 1:1. Simple slope excavations (Type C Soil, cohesion-less soil such as gravel, sand, submerged soil or freely seeping soil, submerged unstable rock) shall have a maximum allowable slope of 1 ½:1.
7. Keep spoils or heavy equipment at least 2 feet from the edge of excavations to prevent them from falling or rolling into excavations. Also, keep tools and other materials that may pose a hazard at least 2 feet from excavation edge.
8. Set barricades, fencing, or guard rails around open excavations with depths in excess of 6 feet to prevent falls into the excavation (see Fall Protection section). When possible, use guard rails with trench boxes. Direct pedestrian traffic away from open excavations. Place fencing around or sturdy covers (road plates or 1 1/8" plywood) over excavations that are unattended.
9. Use manual-cutting tools (snap cutter or hammer) to cut asbestos cement (AC) pipe. Continuously wet the area of the pipe being cut with water to prevent asbestos fibers from becoming airborne. Dispose of asbestos pipe in Concord yard's large yellow debris box (wrap pipe with a double layer of plastic sheeting before disposal). Smoking is prohibited when handling asbestos materials.
10. For excavation work, arrange to have the atmospheric levels checked with an appropriate gas monitor, when there is a strong odor present, or other sign of a nearby release of sewage, fuel, natural gas or other hazardous chemical line. Ensure vehicle exhaust is not entering the excavation.
11. Use an appropriate mechanical aid or seek assistance from another person to transport a tamper (rammer) to and from excavation sites and on to and off of vehicles.
12. Use hand tools to locate the exact location of underground utilities (hand dig or probe). While excavating laterally within 24" of the exterior surface of marked utilities or when all known utilities are not marked, probing or hand digging shall be required prior to mechanical excavation. In areas where buried power lines are suspected or within 24" of electric utility marks, use a non-conducting (fiberglass handle and shaft) probing tool to probe soil. A probe with a steel shaft and electrically-rated insulated handle can be used probe soil further than 24" out from electric utility marks or identified electric utility.
13. Before work on water lines 36 inches in diameter or greater which are not double isolated, follow the O&M High Hazard SOP and assess the hazard of flooding the excavation. Tag out and, if possible, lockout main valves before work on water mains where potential drowning hazard exists.

Tools and Equipment

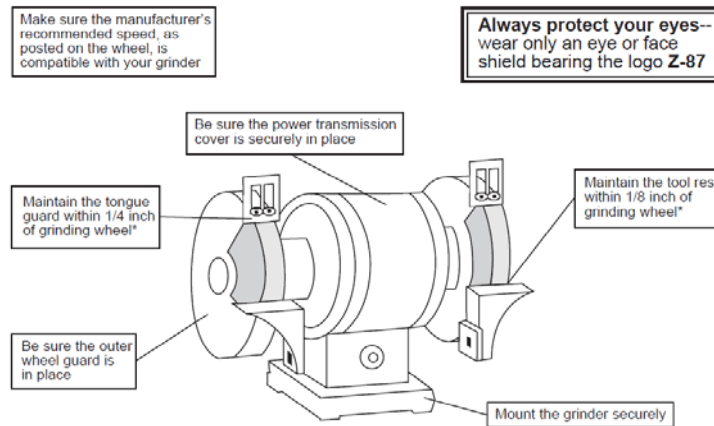
1. Use grounded electric powered tools or double insulated powered tools with ground-fault circuit interrupters (GFCIs).
2. Evaluate the working clearance to overhead high voltage (greater than 600 V) power lines and tree branches near power lines, and adjust work practices to provide for adequate (greater than 10 foot) clearances. Contact PG&E if you are unsure.
3. Use ladders in trench excavations or other confined spaces that are 4 feet or more in depth. Stairs, ladders or ramps shall be used to climb up and down work surfaces 4 feet or more in height. Refer to *Ladder Safety* section for more information.
4. Use hoisting equipment or a forklift for lifting materials weighing over 200 lbs. Ensure capacity ratings and lifting characteristics are appropriate for the task. Use chain slings, synthetic slings, or other rigging only when they are in good condition and their capacity tags or labels are attached. Do not make a lift beyond the rated capacity of the equipment or rigging. Consider wind conditions when handling materials.
5. Conduct annual, documented inspections of all chain slings.
6. Do not stand underneath loads handled by lifting or digging equipment. Set up the work site to avoid having employees position themselves directly under the boom or backhoe bucket to perform work.
7. Heavy equipment operators and employees on foot shall make eye contact before employees on foot assist in controlling a load. Heavy equipment operators must know of the presence of all employees on foot in the areas of their operations.

Crane Hand Signal Chart

 Main Hoist	 Auxiliary Hoist	 Hoist Load	 Hoist Load Slowly	 Stop
 Raise Boom	 Raise Boom & Lower Load	 Lower Load	 Lower Load Slowly	 Emergency Stop
 Lower Boom	 Lower Boom & Raise Load	 Swing Boom	 Swing Boom Slowly	 Travel (mobile eqpt)
 Retract Boom 2 hands	 Retract Boom 1 hand	 Extend Boom 2 hands	 Extend Boom 1 hand	 Dog Everything

8. Use “bear paws” or tag lines to control trenchplate loads and other loads with a hazardous rotation. If on foot and assisting in controlling a load, make sure you have room to escape a potentially uncontrollable load.
9. Stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.
10. Use a portable exhaust fan when welding, operating equipment with combustion engines, or using chemicals (e.g., black mastic, oil-based paints, etc.) in confined spaces or excavations. Do not enter a leak truck’s rear enclosure while its generator is on.
11. To remove 12 inch valve can covers safely:
 - a. Remove pavement that may interfere with cover removal.

- b. Attempt to remove the cover with the cover removal tool.
 - c. If the cover does not lift off after two attempts, use a dead blow hammer to loosen the cover. Re-attempt to remove the cover with the removal tool.
 - d. If the cover does not lift after two more attempts, use a 5+ foot long pry-bar to pry the cover.
 - e. If the cover cannot be pried off, make arrangements to replace the valve can.
12. Seek assistance from another person to manually turn water main line valves. Only authorized staff can operate District valves.
 13. Use water to prevent silica dust from becoming airborne when sawing concrete.
 14. Use manufacturer-recommended safety devices, guards, and shields on grinders, saws, lawn mowers, weed-eaters, and other powered equipment.
 15. Guard all rotating or moving parts of equipment, such as belts, pulleys, chains, and sprockets. Do not disengage safety devices and guards unless equipment is disabled so that it cannot unexpectedly energize. *Exception: A chainsaw's bar nose guard may be removed for certain situations as allowed by the manufacturer's instruction manual.*
 16. Keep hands, fingers, hair, and other body parts away from the energized machine or its parts. When possible, place both hands on the handle(s) of the powered tool or equipment to firmly control it.
 17. De-energize power tools and equipment before removing any guards to perform any service and maintenance on them. For non-cord and plug type equipment: isolate, lock and tag out hazardous energy sources (electrical disconnects and valves) before performing service and maintenance. See Lock and Tag section.
 18. Check regularly all pneumatic and hydraulic hoses and couplings on power-operated equipment for deterioration or damage. Replace if necessary.
 19. Use safety locking pins/clips or "whip-check" safety cables whenever pneumatic tools are used.
 20. Use a fall arrest system (lanyard and harness) when using an aerial boom lift.
 21. Secure all compressed gas cylinders during transport, use, or storage to prevent them from toppling over. When securing to a building wall, secure cylinders with two restraints (one at the top third and one at the bottom third of the cylinder). Place valve protection devices on all stored cylinders.
 22. Grinders:
 - a. Inspect grinding wheels for cracks or damage before use. Ensure guards are in place. For bench/floor grinders, ensure that the tongue guard is within 1/4" of the wheel, and the tool rest is within 1/8" of the wheel.
 - b. Before using a new grinding wheel, make sure the manufacturer's recommended speed, as posted on the wheel, is compatible with your grinder. Perform a "ring" test to ensure the integrity of the wheel.
 - c. Don't stand directly in front of a grinding wheel whenever a grinder is started.
 - d. Don't grind material for which the wheel is not designed.
 - e. Don't force grinding so that motor slows noticeably.



23. Read manufacturer's instructions before operating equipment or tools unfamiliar to you. Comply with all manufacturers' safety procedures. Use only manufacturer-approved parts for all tool and equipment repairs.
24. "Red-tag" all damaged or defective equipment and remove them from service immediately. Tag wording shall read "Danger: Do Not Operate" or equivalent wording.

Traffic Safety

1. Use flaggers when controlled traffic must drive on the wrong side of the road. Use a stop/slow sign to flag traffic. Designate a lead flagger and ensure two-way communication (line-of-sight or radio). One flagger may be used if the work zone is in a residential area with low traffic volume, the flagger has a good view of on-coming traffic in all directions, and the flagger is visible to all traffic from all directions. Use flagger(s) as needed when removing traffic cones and warning signs.
2. For work exceeding one hour on non-residential roads or roads with a speed limit of 30 MPH or more, place:
 - a. a motor vehicle or heavy equipment in the space in front of the active work zone.
 - b. at least three advanced warning signs and/or arrow boards before the flagger's station or work zone. Ensure the flagger has an escape route in case of vehicles entering the flagger's station. Place a barrier to protect the flagger from vehicles if there is no escape route.
3. Consider changing conditions in the evaluation of traffic signage and warning requirements.
4. Pump discharge hoses should not be placed in active traffic paths. When it is absolutely necessary to place a pump discharge hose in an active traffic path for means of safely conveying drainage water from the work area, the hose must be placed within an approved hose ramp. Use signage and a flagger to slow traffic going over the ramp.
5. Obtain City approval on traffic control plans when required.
6. Consider using flashing message boards for night work on busy intersections or as required by the City.
7. Place appropriate detour signs to route traffic around closed streets.

Traffic Control Guidelines

Suggested Advanced Warning Sign Spacing

Road Type	Distance Between Signs (feet)
Urban – 25 mph or less	100
Urban – 30 mph or more	350
Rural	500
Freeway	1000

Placement Guidelines for Traffic Controls

Approach Speed (mph)	Taper Length (L) for 12' wide lanes	# Cones for Taper	Spacing Cones Along Taper
25 (residential)	25'	4	8'
25	125'	6	25'
30	180'	7	30'
35	245'	8	35'
40	320'	9	40'
45	540'	13	45'
50	600'	13	50'
50+	1000'	21	50'

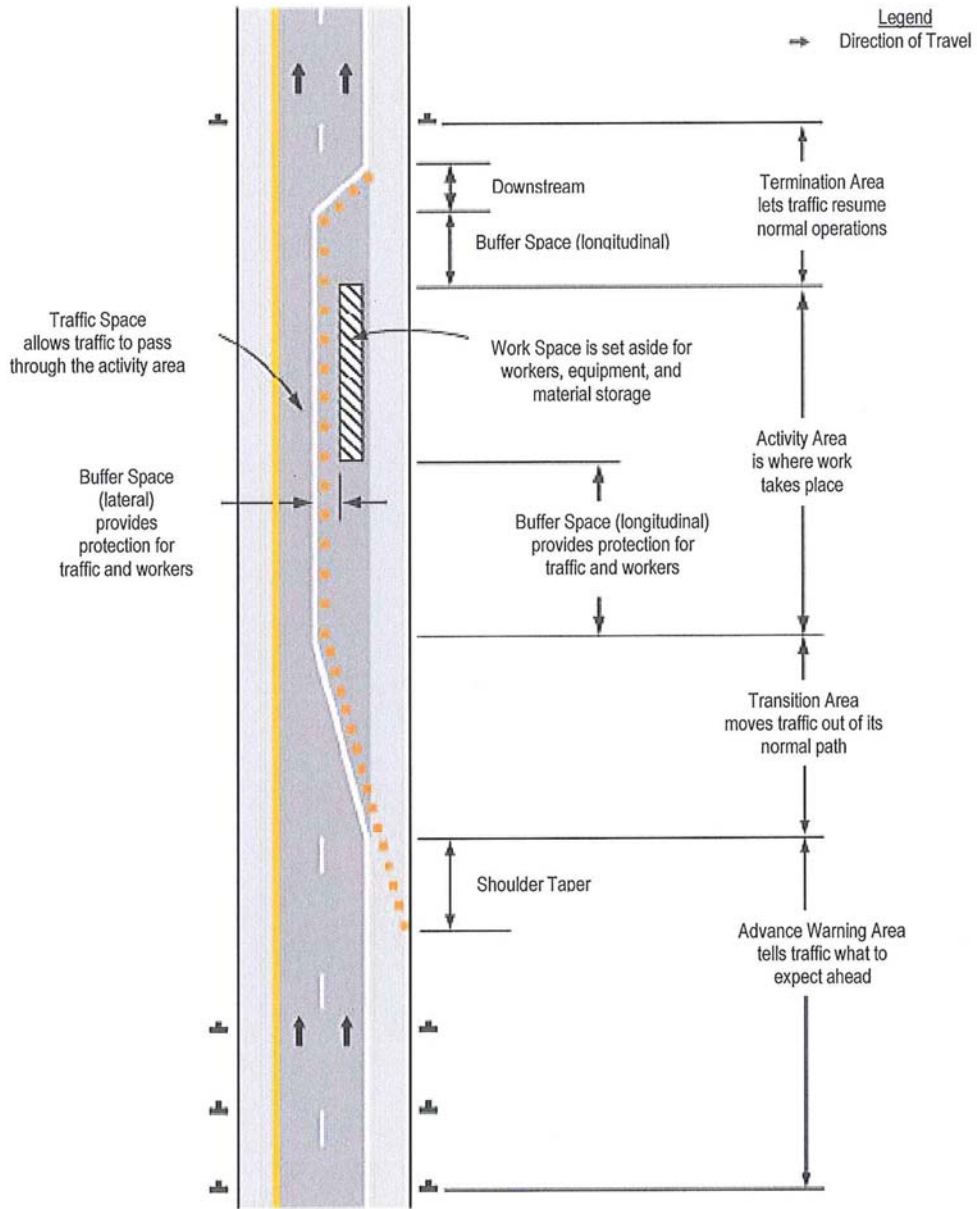
Taper Length Criteria for Temporary Traffic Control Zones

Type of Upstream Taper	Taper Length
Merging Taper	L minimum
Shifting Taper	½ L minimum
Shoulder Taper	1/3 L minimum
Two-Way Traffic Taper	100' maximum

Length of Longitudinal Buffer Space

Speed (mph)	Length of Buffer Space
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335

Parts of a Traffic Control Zone



Canal and Grounds Maintenance

1. Evaluate projectile hazard risks to the other persons before mowing. Close off trails and pathways to help keep pedestrians at least 300 feet away from tractor mower operations. Ensure shields are in place in the front and rear of the mowers. Keep at least 50 feet away from other persons when using push mowers or weed eaters. Consider safer weed abatement alternatives where pedestrians may be present.
2. Wear cut-resistant Kevlar gloves during maintenance of the skip loader bucket used for canal cleaning.
3. Use a ladder when ascending or descending the de-watered canal. Slip-resistant materials on the canal liner may be used if the slope is less than 40 degrees.
4. Follow the Lattice Boom Crane SOP during canal cleaning. Keep away from the counterbalance of cranes and excavators.
5. When stepping on and off the canal cleaning sled while in the canal, wear a personal flotation device as well as a harness. Standby rescue personnel shall be ready and available to pull the harnessed employee using a tether tied to the harness.
6. Throw bags (or similar rescue equipment) must be available in all canal maintenance vehicles
7. Do not trim tree branches that are within 10 feet of live high voltage power lines.
8. Do not climb trees. Use pole saws and/or an aerial manlift to trim high branches.
9. When removing animals from the canal, follow the O&M SOP 2011-01 "Animal Removal from the Contra Costa Canal."
10. Place rebar caps that provide impalement protection on all sharp vertical metal projections.

Plant Operations & Maintenance

1. Where a large amount of a corrosive substance (pH 0-3.5, or pH 11-14) is found spilled in a process area:
 - a. Place danger signs/tape and barricade the hazardous area.
 - b. Immediately notify appropriate plant operations and maintenance staff of the hazard.
 - c. Do not enter into areas where corrosive substances may inundate and/or cause injury.
 - d. If it can be conducted safely with appropriate PPE, determine the pH of the spilled substance (as needed), isolate the leak and capture any leaking liquid in plastic containers.
 - e. Promptly dispose of spilled waste substances with a pH of 0 to 2 or a pH of 12.5 to 14 as hazardous waste. Contact the Environmental Compliance Officer for guidance on disposal. Promptly neutralize spilled corrosive substances with a pH between 2 and 12.5.
2. When opening hazardous material piping or tanks, follow the O&M SOP "Line Breaking Involving Dangerous Materials." Review the appropriate Material Safety Data Sheet (MSDS) before line breaking. Wear self-contained breathing apparatus (SCBAs) when opening systems containing chlorine gas, ozone, or ammonia.
3. Always check atmospheric levels before entering a potentially hazardous atmosphere. Wear appropriate respiratory protection before entering a hazardous atmosphere. Continuously monitor the atmosphere. Ensure that you have been fit-tested for the respirators you wear within the last 12 months.

Air Contaminant	Level in parts per million (ppm)	Respirator Type
Chlorine (at Randall-Bold WTP)	> 0.5 ppm	SCBA only
Sodium Hypochlorite (at Bollman and City of Brentwood WTP)	0.5 to 5 ppm	Respirator with cartridge, or SCBA
	> 5 ppm	SCBA only
Ozone	> 0.1 ppm	SCBA only
Ammonia	25 to 250 ppm	Respirator w/cartridge
	> 250 ppm	SCBA only
Hydrogen Sulfide	> 10 ppm	SCBA only
Carbon Monoxide	> 25 ppm	SCBA only
Oxygen Deficiency	< 19.5 % oxygen	SCBA only
Sulfuric Acid	mists; during line breaking	Respirator w/ cartridge

Review MSDSs for chemical permissible exposure limits, especially when using the chemicals inside enclosed spaces. MSDSs can be found on the Safety Website.

Cartridge Respirator Color Code

Type of air contaminant	Cartridge color code
Organic vapors: solvents, paint (OV)	Black
Acid gases: Sulfuric acid, Chlorine (CL), Hydrofluorosilicic acid (HC), Hydrogen Sulfide, for escape only (HS)	White
Organic vapors & acid gases	Yellow
Ammonia (AM, MA)	Green
Dusts, mists, & fumes: welding fumes, asbestos, silica (high efficiency, P100)	Magenta/Purple

Chemically Compatible Gloves

Chemical	Recommended Glove
Sulfuric Acid	Butyl Rubber, Neoprene
Hydrofluorosilicic Acid (Fluoride)	Nitrile, Neoprene
Aluminum Sulfate (Alum)	Butyl Rubber or Nitrile
Sodium Hydroxide (Caustic)	Butyl Rubber, Vinyl, or Nitrile
Sodium Hypochlorite (Hypo)	PVC or Nitrile
Aqueous Ammonia	Vinyl or Nitrile

Recommended Maximum Work Time Between Rest Periods When Wearing Impermeable or Semi-Impermeable Chemical Protective Clothing

Maximum Temperature	Full Sun	Partly Sunny	Full Shade
70 F	60 min.	90 min.	120 min.
75 F	30 min.	60 min.	90 min.
80 F	20 min.	30 min.	60 min.
85 F	15 min.	20 min.	30 min.
90 F	15 min., light work	15 min.	20 min.
95 F	Extreme Danger	Danger	15 min.

Welding, Cutting and Other Hot Work

1. Keep cylinders, valves, regulators, hose fittings, clothes and gloves free of oil and grease. Keep flammable and combustible materials out of shirt pockets.
2. Never swap oxygen or acetylene regulators and hoses, and never use them with any other gas. Oxygen hose and regulator fittings will have right-hand threads and its hose will be either black or green. Acetylene hoses and regulator fittings have left-hand threads and its hose will be red.
3. Ensure hoses are bound firmly to the connections and ensure all fittings are tight.
4. Never use oxygen and acetylene without the regulator valves and pressure gauges.
5. Use the pressures recommended by the torch manufacturer.
6. Before attaching a regulator to a cylinder, "crack" the cylinder valve (open the valve for an instant to blow dust or dirt out). Do not stand in front of valves when opening them.
7. Use the correct size cutting tip. Discard damaged tips.
8. Flash back arrestors must be installed on all torch connections.
9. Stand to one side of the regulator and very slowly open the cylinder valve on the oxygen all the way. Open the acetylene valve no more than $\frac{3}{4}$ of a turn. Take the T wrench out of the cylinder and keep it close at hand. Tops of cylinders must be unobstructed at all times so valves may be quickly closed.
10. Always set regulating pressures with torch valves open. Adjustments can be made only when the gases are flowing.
11. Light the torch only with a friction lighter.
12. Use exhaust ventilation when welding or cutting in enclosed spaces. Use a gas monitor to confirm safe atmospheres. Do not place cylinders into confined spaces.
13. Do not apply heat to coatings that generate hazardous fumes when heated. Containers which have contained flammables, combustibles or unknown materials shall not be cut or welded.
14. To prevent fires from flames, sparks and molten metal, remove or wet down dry vegetation at least 35 feet around the work area and 75 feet downwind. Cylinders shall be kept far enough away from hot work so that sparks, slag or flame will not reach them. Use fire resistant shields (plywood) as needed.
15. Turn off the torch before laying it down.
16. Always shut off the torch oxygen valve first, then the fuel torch valve. Close both cylinder valves. Re-open the torch oxygen valve to release system pressure then close it. Next, re-open the torch fuel valve then close it. Always release regulator adjusting screws after use.
17. Close all valves on cylinders when storing and/or transporting in vehicles. The regulator gauge should read zero. For long-term storage in buildings, close all valves, remove regulators and secure valve caps. Before a regulator is removed, close the cylinder valve and release the gas from the regulator.
18. Cylinders shall be used, stored or transported in an upright and secured so they cannot fall over and/or fall out of the truck.
19. Cylinders shall never be transported by a forklift unless in a secured and approved transportation apparatus.

20. Valves of empty cylinders shall be closed and cylinders marked "MT" (empty) and properly stored.
21. Separate acetylene and oxygen cylinders stored in buildings by 20 feet or a 2-hour fire wall.
22. Use an oil-free, non-combustible material to test lines for leaks. If leaks are found which cannot be stopped by closing valves, the cylinders shall be taken outdoors away from sources of ignition and slowly emptied. Do not use defective regulators, torches or hoses.
23. Shield welding work from others to prevent eye damage.
24. Ensure arc welder electrodes and ground are in good repair.
25. Do not recklessly discard electrode stub ends since they may ignite combustibles, cause burns or create a slip hazard.
26. Turn off electric welding equipment when not in use.
27. Keep an ABC-rated fire extinguisher near hot work activities. Follow fire watch and hot work permit procedures as required.

Original Date: June 14, 2006
Revised Date: September 23, 2011

BOATING SAFETY

Follow these safety rules while using a boat on reservoirs and canals:

1. Do not operate a boat unless properly trained.
2. Check the weather report before at the start of the day. Do not operate a boat in inclement weather except when needed to conduct a rescue.
3. Each boat occupant must wear a USCG-approved personal flotation device (PFD). Each occupant must carry a whistle or horn to alert others in case of emergency.
4. Request the USCG Auxiliary to conduct a vessel safety check every two years. Follow USCG recommendations. Inspect the condition of the boat before launching.
5. Each boat must have the maximum carry capacity marked. Do not exceed the maximum occupancy or carrying capacity.
6. Each boat must have a means of communication (e.g., push-to-talk device or cell phone). Use a District radio where cell service is not available. Hourly safety checks are conducted.
7. Each boat must carry a fire extinguisher and a USCG-approved throwable rescue device.
8. If the boat operator expects the boating activity to take longer than four hours, a written float plan must be prepared. The float plan must include the following information: names of personnel on board, activity to be performed, expected time of departure, route, time of return and means of communication. The plan is approved by the operator's supervisor.
9. A minimum of two trained persons launch or retrieve a boat from a boat ramp.
9. Ensure there is enough fuel for the boating activity.
10. Ensure there is enough drinking water for the boating activity.

Original Date: September 23, 2011
Revised Date: September 23, 2011

CONFINED SPACES

All employees shall follow these confined space rules for permit- and non-permit-required confined spaces. If the rules are not feasible, please contact the Safety Officer for further guidance. Before entering confined spaces (vaults, tanks, buried reservoirs, tunnels and pipes):

1. Remove standing water to less than 3 inches in depth;
2. Monitor the atmosphere with a calibrated gas monitor device with oxygen, carbon monoxide, hydrogen sulfide and explosive atmosphere sensors. Where an atmosphere of ammonia, chlorine, ozone, or organic vapors may exist, monitor the atmosphere with sensors that can detect those hazards or use appropriate respiratory protection during entry.
3. Use an appropriate ladder when needed;
4. Use a "permit" procedure, where spaces are posted as "permit-required", where spaces depths exceed 10 feet or where serious hazards (atmospheric, engulfment/drowning or electrical) exist. A permit procedure includes use of a Confined Space Permit checklist, use of a retrieval and fall protection system (unless the system poses a greater hazard or is not feasible), and attendant(s) or rescue personnel available on-site that are prepared to act on a confined rescue plan;
5. Use mechanical ventilation as needed; use exhaust ventilation during welding/cutting activities;
6. Eliminate hazards by purging hazardous chemicals, using positive isolation methods (e.g., double block and bleed), and locking out energy sources;
7. Have self-contained breathing apparatus (SCBAs) available for standby rescuers where hazardous atmospheres may exist; and
8. Where access to and from the space is horizontal, fall protection may not be required. However, entrants shall wear harnesses to help assist rescue personnel in retrieval. Consider tethering entrants for ease of retrieval.

All confined space personnel must be trained. Rescue personnel must have participated in a confined space drill with the last 12 months, and be certified in CPR and first-aid.

When entering confined spaces, follow the CCWD Safety & Health Manual's Confined Space Entry Program (see the Safety Website under Safety Library). A list of District Confined Spaces can be found at: <http://www.ccwd-staff.com/spaces.asp> .

Original Date: September 23, 2011
Revised Date: September 23, 2011

FALL PROTECTION

Follow these rules to safely work at elevated heights:

1. Install temporary standard 42" guard rails or fencing whenever possible to provide protection from falls over 7.5 feet.

Set barricades, fencing, or guard rails around open excavations with depths in excess of 6 feet to prevent falls into the excavation. When possible, use guard rails with trench boxes.

2. Wear proper fall protection equipment (harness with a fall arrest or fall restraint device tied to an anchor point) when working on the leading edge of unprotected work surfaces more than 7.5 feet in elevation or unprotected sloped work surfaces greater than 40 degrees and more than 7.5 feet in elevation. Fall protection equipment is required to be worn if you are working within 6 feet from an unprotected edge.
3. Do not use fall protection equipment unless properly trained. Inspect fall protection equipment before use. All fall protection equipment must undergo a semi-annual documented inspection by a trained, competent person.
4. Anchor points must be capable of supporting 5000 lbs per attached worker. Do not attach fall protection equipment to guard rails. When practical, secure the anchor end of the fall arrest device at a level not lower than your waist.
5. A fall arrest device can be a shock absorbing lanyard or a self-retracting lifeline. Lifelines shall be protected against damage.
6. Body belts are worn only for fall restraint, not as part of a fall arrest system.
7. When the use of guard rails or other conventional fall protection is impractical or creates a greater hazard, contact the Safety Officer for further guidance.
8. Scaffolds are erected only by trained competent persons.

Original Date: September 23, 2011
Revised Date: September 23, 2011

LOCK AND TAG

Follow these lock and tag procedures during all confined space entries and all construction and maintenance activities on machinery or equipment where a hazardous release of energy is possible including electrical, mechanical, chemical, hydraulic, pneumatic and potential. These steps shall be performed as part of Lock and Tag Procedures:

1. Notify all affected personnel (including operators of machinery/ equipment/facility) during a hazard analysis tailgate meeting before the activity.
2. Identify all hazardous energy sources, their energy isolation devices (e.g., circuit breakers, valves, etc.), control circuit-type devices (e.g., push buttons, selector switches, etc.), block-out points, drain/bleed points and energy indicator devices (e.g., gauges, panel lights). If more than one energy isolation device is identified, then document all isolation devices as well as isolation devices on the Lockout/Tagout Isolation Sequencing form.
3. Shutdown. All operating controls shall be turned off or returned to the neutral position (depress stop button, open switch, close valve, etc.). Deactivate the energy isolation device so that the machine/ equipment is isolated from the energy source. Disable motor-operated valves.
4. Lockout. A locking device is placed on each energy-isolating device to isolate each energy source. If needed for large shutdowns, the lock keys are placed inside a lock box. Each employee involved shall place their own uniquely keyed lock and tag at each isolation point, or at the lock box. Ensure that outside contractor employees also use their own locks and tags on the isolation points. The lead employee, supervisor, or project engineer initials each isolation point description listed on the Lockout/Tagout Isolation Sequencing form after lockout.
5. Tagout. Do not use tags alone on energy isolation points unless the isolation point is not lockable. The tag must be attached using a zip tie (or equivalent) and have the following information: name, "Danger – Do Not Operate" (or equivalent wording), date, and contact information.

Machines or equipment not equipped with lockable controls shall be disconnected from its source of power to prevent inadvertent movement or release of hazardous energy. Tag equipment controls. Implement additional safety measures such as the removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the risk of inadvertent energization.

6. Drain, Bleed, Purge Stored Energy. Stored or residual energy (such as capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, pressurized air, gas or water systems, chemicals, etc.) must be dissipated by methods like grounding, bleeding down, flushing, etc. If necessary, moveable parts shall be mechanically blocked to prevent inadvertent movement.

Portions of chemical systems to be opened must be depressurized and drained as completely as possible, thoroughly washed, flushed, purged and/or vented (if safe). Some toxic gases may not be safely vented. For more specific guidance, follow the O&M Line Breaking Procedures.

7. Verification of Lockout. First, check that no personnel are exposed, then verify isolation of equipment by operating the push buttons, switches or other normal operating controls, by testing to make certain the equipment is not energized (voltage tester), and/or by visual inspection to ensure the equipment will not otherwise operate. Return operating controls to neutral or "off" position after verification.

Follow the CCWD Safety & Health Manual's Lock and Tag Program (see the Safety Website). Exceptions to the Lock and Tag Program: electrical troubleshooting performed by qualified electricians and hot tapping of water pipelines.

Original Date: September 23, 2011
Revised Date: September 23, 2011

SAFETY FEEDBACK

Recognize and take advantage of opportunities to give safety feedback. Be willing to listen and respond. Give and accept feedback in a constructive manner.

Guidelines for giving positive safety feedback:

1. Be positive, sincere, respectful, and open
2. Describe what you've observed
3. State the positive effect of the behavior or action (keeping safe, setting of a good example for others).
4. Listen for a reaction or ask for a response

Guidelines for constructive safety feedback:

Provide feedback focused on the issue or problem, not the people or personalities involved. Be "hard on problems, soft on people."

1. Be positive, sincere, respectful, and open. ("I know you are an expert in _____. But I noticed a safety issue. I'd hate to see an injury").
2. Describe what you've observed. Focus on the situation, don't make it personal.
3. State the effect of the behavior or action ("You could get hurt").
4. Listen actively for a reaction or ask for a response, ask questions ("That's how I see it. What do you think?").
5. Discuss until agreement is reached, stay calm, be persistent.
6. Use objective standards whenever possible which are not personal or subjective and easier to accept and be agreed upon.

Guidelines for accepting constructive safety feedback:

1. Be willing to welcome feedback as an opportunity to learn and grow (even if you think they are wrong, or they upset you because of their bad delivery).
2. Listen and focus on the content, not the personality traits of the giver.
3. Respond by acknowledging the other person's concerns, clarify feedback if necessary.
4. Avoid defending or over-explaining, discuss until agreement is reached, don't make excuses, focus on a solution, be calm.
5. Thank the giver for working with you in a constructive manner.

SAFETY COMMITTEES

District Safety Committee

	<u>Phone</u>
Greg Dixon, Chair	240-2368
Peter Stabb, Co-Chair	513-2174
Pam Gibson	260-4460
Alfredo Ibarra	679-3522
Marco Siragusa	240-2360
Matt Fowler	688-8095
Jonathon Hackett	688-8095
Ken Swenson	525-2516
Rene Romiski	688-8135
John Nies	765-4804
Chris Hentz	688-8311
Leah Orloff	688-8083
Spiro Zapantis	688-8185
Steve Welch (Management Rep)	688-8060
Goolu Lashkari (Secretary)	688-8068

Site Safety Committees

District Center and Bisso Administration Building

Jeanie Linden, Chair	688-8335
Marie Valmores, Co-Chair	688-8132
(Other members: Mehria Albert, Tom Cranmer, Dino Angelosante, Desiree Castello, Andrea Jarske)	

Central County Operations & Maintenance and Stores

Gary Mills, Chair	525-2492
(Other members: Tracy Woodard, Tim Kirby, Jason Schneider, Sal De La Madrid, Corrie Warner, Don Spahn, Jim Rolle)	

East County Operations & Maintenance and Los Vaqueros Watershed

Lance Hartung, Chair	383-2297
(Other members: Dan Mello, Jeff Summers, Vic Smith, Tom Branch, John Parsons, Ron Gardner, John Gonsalves, Rich Madrigal, Nicole Quesada)	

Safety Improvement Task Force

Steve Welch, Greg Gartrell, Pete Schoemann, Elia Bamberger, Desiree Castello, Shawn Kelly, Jeanie Linden, Dan Mello, Nate Porto, John Howard, Spiro Zapantis, Goolu Lashkari

Tear at dotted line and return the bottom portion to Spiro Zapantis at Mailstop OM5. All District employees are required to read, understand and follow the practices of this handbook.

I have read and understood the CCWD Safety Handbook and I understand it is my responsibility to follow the safe work practices described in this handbook.

Print Name _____

Signature _____

Date: _____