



TROUBLE AT LIFT STATION NO. 1 (MAIN)

The Main Lift Station No. 1 Cummins top-of-the-line generator should be running in the event of a power failure. This generator was installed in 2021-22. It has no maintenance automatic shutdown to get in the way of normal operation.

The generator has a small (12-second) delay for power out before it kicks over the transfer switch. The Mission Alarm Control Panel has a one-minute delay to notify the water staff via phone tower. Very rarely, there can be phone tower issues and the minutes can be increased. If the AC or “shore power” is restored before the operator arrives on site, then the generator may still be running, but will be in “cool down” mode.

- 1) Check the power line’s knife switch at the telephone pole across the street. It should be closed, indicating there is power in the supply lines.
- 2) Check the power meter for display. It should be operating if shore power has restored. It will be out if the generator is still supplying power.
- 3) The transfer switch is in the electrical panel by itself in a 6.5 ft. electrical box outside the station. It also has an almost-new LED display which indicates whether on shore power or generator power. Remember, anywhere there is a generator transfer switch, the phase sensors in the transfer cabinet can wear out after many years, causing problems in transfer functions. This is a job for a qualified electrician. If the transfer switch is failing to start the generator, these sensors are a good place to start troubleshooting.
- 4) Open the hatch on the Main Lift Station. Are there lights coming on down below? If yes, power is present in the vault. You should have operational pumps.
- 5) The pumps can be tested, or bumped, slowly on “Hand,” which is a manual turn on. Use the manual switch on the panel. Pump capability can be tested this way.



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- 6) If no pumps are operational, then access power panel and check the breakers. There are also breakers outside at the power junction box, but the meter would have been blank if there was a problem there.
- 7) If there are no blown breakers, and no pumps, does it try to run? Can you hear a click? The contactor could be damaged. This is a job for a certified electrician only. Notify the district manager Immediately.
- 8) If the generator and the shore power are failing, and the troubleshooting shown above fails, notify the entire crew. This is not going to be a one-man job.
- 9) Prepare to run the *emergency bypass pump*. This is a gasoline-powered pump and has an electric start.
- 10) Remember to check the *prime line* on the top of the gasoline bypass pump to make sure it is closed.
- 11) Turn off the pump switches on the panel down in the dry well. Switch from Auto to Off. If this station is running on AC, or Generator, then you will not get an "AC power out" phone call. In this circumstance, turning these off does not trigger an alarm. If both shore power and generator have failed, you will have been already notified via cell phone tower, of an AC power outage. Note: Operator will not get alarm calls when down inside the dry well but should not be concerned as he/she will be too busy to deal with calls.
- 12) Use your key-out magnet on your keychain to disable "high wet well alarms." You may have already done this if the levels of influent are high enough in the tank.
- 13) Double check: Is the 4-inch bypass valve open? Are the electric pumps off down in the dry well? Is the prime valve (3/4 inch valve on top of the gasoline pump) closed?
- 14) Open the manhole cover to the Main Lift Station tank. Observe the flood level. There are two tar lines in the tank which are readily visible. The top tar line looks like a rust line. These will never change and are a good visual reference for when to start your gasoline bypass pump. The starting point is about three inches above the top tar line. These tar lines are sections of the tank with gaskets between them. If the operator prefers, he/she can use the level gauge



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inside the dry well for start and stop times to run the gasoline bypass pump. Unplug the battery charger before starting pump. If the battery should be charged, and the acid has been cooked out, an explosion of the battery can occur.

- 15) Set the choke and start the pump using both ON switches on the pump. One switch for "IGNITION ON" and the second switch for "START". Prime the pump while running by opening and closing prime valve. The operator can see the priming influent running out into the tank through the prime line. This prime valve is located on top of the gasoline pump and is used to prime the pump while running. If this valve is left open, prime will not be achieved.

Open the valve; the pump motor will bog down a bit as the pump fills with influent. Close the valve. Wait! Watch the pressure gauge that is mounted to the gasoline pump primer valve. It will hover back and forth as the influent is drawn up into the suction pipe. Several, and even many attempts, will be made to achieve suction in the suction pipe. The influent should be crawling further with each open and close of the prime valve. If prime is not achieved for too long a period, the influent inside the pump will get hot if it is not pumping yet. Open the prime valve for a few more seconds to cool down the influent, and start over with priming attempts. 5 to 10 psi is where the prime gauge on top of the pump will fluctuate while attempting to prime the gas-powered bypass pump. When it primes up and starts to pump, the gauge will reach up to 19 psi on the gauge, and settle out to 15 psi as the force main gets moving. If at 15 psi or above, the operator will know it is pumping. If unsure whether pumping is strong or not, call the Water Reclamation Facility (WRF) operator and ask them if influent is coming in hard.

- 16) The level gauge is located on the electrical panel. When the gauge is about 50 inches, that is a good time to start gasoline pump. When it is at about 30 inches, it is a good time to stop. Do not over-pump the tank. It is better to stop too high than stop too low. The level alarm for this tank will call your phone, if the level reaches over 45 inches. Going up and down the access



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ladder to read this gauge is not recommended as the operator will tire quickly and take valuable time, not to mention the phone signal to the operator's phone is cut off when inside the dry well. It is operator's preference for controlling influent level. Sometimes the operator may pump down further with the bypass pump, but beware of picking up unwanted material that floats on the top of the influent in that tank. There are clues when pumping down too far with the gasoline pump. The pump will start running rough and backfiring more. A vortex may also appear towards the bottom of the suction pipe. These are all indications you need to stop the gasoline pump. Get familiar with this pump. It is an old Briggs and Stratton manual choke, but is a strong and not prone to plugging the pump. Choke it and when it starts running, immediately begin to open choke.

If this pump ever floods and won't start, do not waste time trying to start it. There is an emergency spark plug in the tool box in the gasoline bypass pump doghouse. Change it immediately. The pump motor will more likely recover quickly this way. If the motor is fully warmed up, it should start without choke.

The gasoline pump can be pumped down to 20" on that tank gauge, but the 30" off rule is for testing the electric pumps after station is back to normal. Let the station run from 30" to 20" on "Auto" to be sure the station is functioning normally. 20" is the normal "on" level for the electric pumps.

Before returning to electric or A.C. operation of pumps. Close the 4" bypass valve. Do not close this valve if still using gasoline pump, you will pump in a circle, back to the tank. With the 4" bypass valve closed; operator can now turn the electric pumps back to "Auto". If the level is above 20", usually 30" if you stopped the gas pump where you should, it will pump on auto and finish pumping to about 5" on the gauge in the dry well. (Gauge is Ft. Pounds and not inches). It is preferred to return to A.C. pumps after bypass, to run just one pump on "Auto." Let it complete the pump down, and then switch the other pump to "Auto." You can switch both pumps on "Auto," but it will use



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both pumps to finish, as the flood flag has been thrown on the alarm. (Less stress on the 90 turns, underground).

Note: The 4" bypass valve to this station is a rubber coated gate valve. It is not necessary to over tighten it, just "Snug" is fine. This is the 4" valve in the Green Box in front of the station. Use your valve key from your truck or there is also a valve key hanging on the ladder rungs, inside the dry well.

Always have a flashlight handy when viewing all stations in Sunland. Just because its daytime, does not mean you will be able to see influent levels in tanks. They are often hard to see as the sunlight blocks the operators view if it is in the wrong place on the horizon.

Always keep trucks at least ¼ tank of fuel. Operator may have to use truck headlights in an emergency, with storm conditions present. Floodlights are also available with a generator.

The Main Lift Station is generally only run by "Senior" operators. This is the total of Sunland's Sewer influent coming here. Training is provided for staff.

When station is normally under way, the trickle charger should be plugged in. This is a "Floating" charger and so should not overcharge the battery. A tickle charger will overcharge the battery, and create a dangerous dry condition of the battery.

Remain onsite after emergencies or repairs, or even monthly emergency tests. This is to verify pumping station is running properly on its own. Both pumps in "Auto."

The Gasoline Emergency pump at the Sewer Lift Station #1 is a third redundancy. First redundancy is second lag electrical pump. Second redundancy is a backup generator. Third redundancy is the emergency gasoline poured generator. Although the gas pump is exercised and tested monthly, it is unlikely to be needed for power outages